

Lander's Q

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Fri, 27 Oct 2017 09:10:59 -0400

I might say -

(b)(5)



Sent from my iPhone

Latents

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Fri, 15 Dec 2017 16:45:08 -0500
Attachment Background doc (16 76 kB)

[REDACTED] you think it reads (b) (6)
Edits welcome.

Kira Antell
Senior Counsel
Office of Legal Policy
U.S. Department of Justice
950 Pennsylvania Avenue, NW
Washington, DC 20530

(b) (6)
(b) (6)

Background-My Edits

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Fri, 15 Dec 2017 18:57:52 -0500
Attachment Hunt Edit Background doc (20 46 kB)

Kira,

Good background. I provided some edits, but the substance didn't change too much. And for some reason I couldn't get track changes to work on this (it's probably me).

Ted

Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave. NW
C 20530

(b) (6)
(U) (U)

RE: PCAST-Latent Prints

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Thu, 12 Jul 2018 07:16:00 -0400

Thanks!

From: Hunt, Ted (ODAG)
Sent: Wednesday, July 11, 2018 10:03 PM
To: Antell, Kira M (OLP) (b) (6)
Subject: PCAST-Latent Prints

Latest PCAST opinion – EDNY.

Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave. NW
Washington, DC 20530

(b) (6)
(b) (6)

Media Questions

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Wed, 29 Nov 2017 17:03:12 -0500
Attachment T Hunt Re pon e to Media Que tion doc (30 04 kB)

Here you go...at least it was cathartic for me.

Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave. NW
Washington, DC 20530

(b) (6)
(U) (0)

1. In response to the 2016 PCAST report on forensic science, the DOJ said it would “not be adopting the recommendations related to the admissibility of forensic science evidence.” As head of the new Forensic Science Working Group will you continue support this policy, and/or how will you address the fact that multiple scientific bodies (PCAST, NRC, AAAS), have concluded that many forensic methods -- including latent fingerprint, firearms/toolmarks, and bitemarks -- either lack scientific validity or have not yet been scientifically validated?

(b)(5)

(b)(5)

2. The 2009 NAS report suggested that the DOJ should not be the home of forensic science reform, even if advised by outside stakeholders, citing a strong potential for bias, despite well-meaning intentions. How would you respond to this?

(b)(5)

(b)(5)

3. A DOJ press release dated August 7, 2017 states: “The Department stands with the forensic science community and against efforts by some to reject reliable and admissible forensic evidence.” What is the DOJ’s definition of “reliable” and how is it determined?

(b)(5)

(b)(5)

Given the DOJ's statement that it "stands with the forensic science community" what steps will the Forensic Science Working Group take to ensure that it will consider potential criticisms of forensic theories or practices -- which may or may not undermine entire fields of forensic science (CBLA is one past example) -- in an unbiased manner?

(b)(5)

4. Given the adversarial nature of the American justice system and your experience as a prosecutor, what factors do you think might lead prosecutors to resist attempts to limit the types of forensic evidence admissible in court and/or attempts to soften the language of certainty allowed in forensic testimony? What factors might encourage prosecutors to support such reforms?

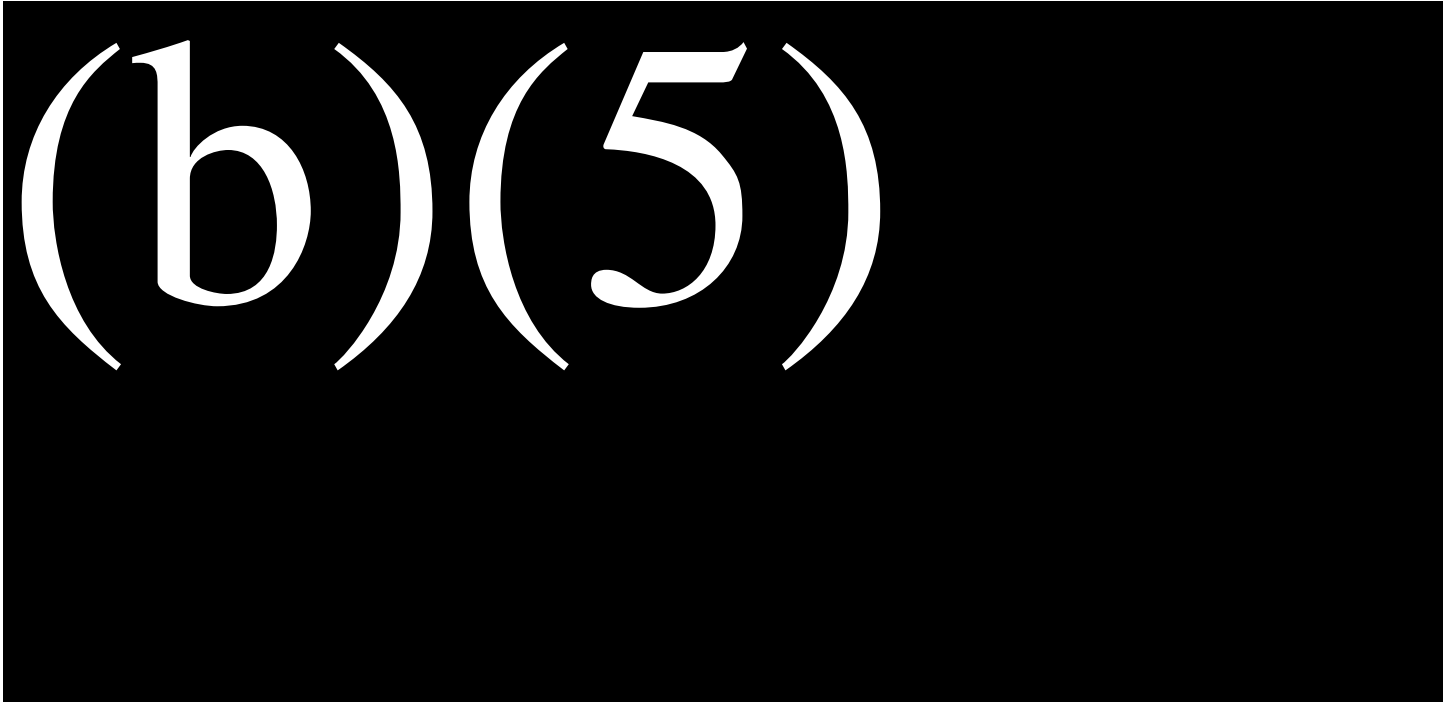
(b) (5)

5. The NCFS proposed a “Statistical Statements in Forensic Testimony,” which you ultimately voted against. At NCFS meeting #13 (April 2017), you remarked that you were concerned the statistical views document would suggest a fingerprint examiner or toolmark examiner should not be able to say “I have identified this known print to this questioned print...that a firearms examiner shouldn’t be allowed to say that this shell casing was fire from this gun.” Some forensic experts, along with respected scientists, have said that scientific evidence does not support such “absolute” or even “practical” claims of a match. Rather, they state that examiners giving testimony in court should present the chances that their assessment could be right/wrong, based on sources of potential error or uncertainty in their field. For fields where reliable numbers are not available, the suggestion is that forensic expert witnesses indicate an absence of studies. Why do you oppose adding that language to testimony?

(b) (5)

6. The Jan 2017 issue of the United States Attorneys’ Bulletin states: “In April 2015, FBI, IP, and NACDL issued a joint press release in which the FBI acknowledged that at least

90 percent of trial transcripts analyzed as part of the MHCA review contained erroneous statements. The FBI found that 26 of 28 FBI agent/analysts provided either testimony with erroneous statements or submitted laboratory reports with erroneous statements. The review found that the overstated forensic matches favored prosecutors in over 95 percent of the trials reviewed.” How will the new Forensic Science Working Group in the DOJ improve forensic expert testimony and work to prevent biased and/or erroneous testimony that tends to favor prosecutors?



T. Hunt Responses to Media Questions_KMA

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Thu, 30 Nov 2017 09:51:47 -0500
Attachment T Hunt Re pon e to Media Que tion KMA doc (34.25 kB)

Suggestions. Note, I changed your type to purple so my redline would be visible. We can discuss this morning.

1. In response to the 2016 PCAST report on forensic science, the DOJ said it would “not be adopting the recommendations related to the admissibility of forensic science evidence.” As head of the new Forensic Science Working Group will you continue support this policy, and/or how will you address the fact that multiple scientific bodies (PCAST, NRC, AAAS), have concluded that many forensic methods -- including latent fingerprint, firearms/toolmarks, and bitemarks -- either lack scientific validity or have not yet been scientifically validated?

(b)(5)

2. The 2009 NAS report suggested that the DOJ should not be the home of forensic science reform, even if advised by outside stakeholders, citing a strong potential for bias, despite well-meaning intentions. How would you respond to this?

(b)(5)

3. A DOJ press release dated August 7, 2017 states: “The Department stands with the forensic science community and against efforts by some to reject reliable and admissible forensic evidence.” What is the DOJ’s definition of “reliable” and how is it determined?

(b)(5)

(b)(5)

4. Given the adversarial nature of the American justice system and your experience as a prosecutor, what factors do you think might lead prosecutors to resist attempts to limit the types of forensic evidence admissible in court and/or attempts to soften the language of certainty allowed in forensic testimony? What factors might encourage prosecutors to support such reforms?

(b)(5)

(b)(5)

(b)(5)

5. The NCFS proposed a “Statistical Statements in Forensic Testimony,” which you ultimately voted against. At NCFS meeting #13 (April 2017), you remarked that you were concerned the statistical views document would suggest a fingerprint examiner or toolmark examiner should not be able to say “I have identified this known print to this questioned print...that a firearms examiner shouldn’t be allowed to say that this shell casing was fire from this gun.” Some forensic experts, along with respected scientists, have said that scientific evidence does not support such “absolute” or even “practical” claims of a match. Rather, they state that examiners giving testimony in court should present the chances that their assessment could be right/wrong, based on sources of potential error or uncertainty in their field. For fields where reliable numbers are not available, the suggestion is that forensic expert witnesses indicate an absence of studies. Why do you oppose adding that language to testimony?

6. (b)(5)

The Jan 2017 issue of the United States Attorneys’ Bulletin states: “In April 2015, FBI, IP, and NACDL issued a joint press release in which the FBI acknowledged that at least 90 percent of trial transcripts analyzed as part of the MHCA review contained erroneous statements. The FBI found that 26 of 28 FBI agent/analysts provided either testimony with erroneous statements or submitted laboratory reports with erroneous statements. The review found that the overstated forensic matches favored prosecutors in over 95 percent of the trials reviewed.” How will the new Forensic Science Working Group in the DOJ improve forensic expert testimony and work to prevent biased and/or erroneous testimony that tends to favor prosecutors?

(b)(5)

(b)(5)

Media Response

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Thu, 30 Nov 2017 15:58:46 -0500
Attachment T Hunt Re pon e to Media Que tion TRH Reply to KMA 11302017 doc (28.66 kB)

My edits to yours. Ready for your addition.

Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave. NW
Washington, DC 20530

(b) (6)
(b) (6)

1. In response to the 2016 PCAST report on forensic science, the DOJ said it would “not be adopting the recommendations related to the admissibility of forensic science evidence.” As head of the new Forensic Science Working Group will you continue support this policy, and/or how will you address the fact that multiple scientific bodies (PCAST, NRC, AAAS), have concluded that many forensic methods -- including latent fingerprint, firearms/toolmarks, and bitemarks -- either lack scientific validity or have not yet been scientifically validated?

(b)(5)

The 2009 NAS report suggested that the DOJ should not be the home of forensic science reform, even if advised by outside stakeholders, citing a strong potential for bias, despite well-meaning intentions. How would you respond to this?

(b)(5)

(b) (5)

2. A DOJ press release dated August 7, 2017 states: "The Department stands with the forensic science community and against efforts by some to reject reliable and admissible forensic evidence." What is the DOJ's definition of "reliable" and how is it determined?

(b) (5)

Given the DOJ's statement that it "stands with the forensic science community" what steps will the Forensic Science Working Group take to ensure that it will consider potential criticisms of forensic theories or practices -- which may or may not undermine entire fields of forensic science (CBLA is one past example) -- in an unbiased manner?

(b)(5)

(b)(5)

3. Given the adversarial nature of the American justice system and your experience as a prosecutor, what factors do you think might lead prosecutors to resist attempts to limit the types of forensic evidence admissible in court and/or attempts to soften the language of certainty allowed in forensic testimony? What factors might encourage prosecutors to support such reforms?

(b)(5)

(b)(5)

(b)(5)

4. The NCFS proposed a “Statistical Statements in Forensic Testimony,” which you ultimately voted against. At NCFS meeting #13 (April 2017), you remarked that you were concerned the statistical views document would suggest a fingerprint examiner or toolmark examiner should not be able to say “I have identified this known print to this questioned print...that a firearms examiner shouldn’t be allowed to say that this shell casing was fire from this gun.” Some forensic experts, along with respected scientists, have said that scientific evidence does not support such “absolute” or even “practical” claims of a match. Rather, they state that examiners giving testimony in court should present the chances that their assessment could be right/wrong, based on sources of potential error or uncertainty in their field. For fields where reliable numbers are not available, the suggestion is that forensic expert witnesses indicate an absence of studies. Why do you oppose adding that language to testimony?

(b)(5)

The Jan 2017 issue of the United States Attorneys’ Bulletin states: “In April 2015, FBI, IP, and NACDL issued a joint press release in which the FBI acknowledged that at least 90 percent of trial transcripts analyzed as part of the MHCA review contained erroneous statements. The FBI found that 26 of 28 FBI agent/analysts provided either testimony with erroneous statements or submitted laboratory reports with erroneous statements. The review found that the overstated forensic matches favored prosecutors in over 95 percent of the trials reviewed.” How will the new Forensic Science Working Group in the DOJ improve forensic expert testimony and work to prevent biased and/or erroneous testimony that tends to favor prosecutors?

(b)(5)

(b)(5)

RE: Media Response

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Thu, 30 Nov 2017 16:16:22 -0500
Attachment: T Hunt Re pon e to Media Que tion TRH Reply to KMA 11302017v2 doc (30 59 kB)

[See what you think](#) Not quite a pithy a I promi ed

From: Hunt, Ted (ODAG)
Sent: Thursday, November 30, 2017 3:59 PM
To: Antell, Kira M. (OLP) <(b) (6)>
Subject: Media Response

My edits to yours. Ready for your addition.

Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave. NW
C 20530

(b) (6)
(U) (0)

1. In response to the 2016 PCAST report on forensic science, the DOJ said it would “not be adopting the recommendations related to the admissibility of forensic science evidence.” As head of the new Forensic Science Working Group will you continue support this policy, and/or how will you address the fact that multiple scientific bodies (PCAST, NRC, AAAS), have concluded that many forensic methods -- including latent fingerprint, firearms/toolmarks, and bitemarks -- either lack scientific validity or have not yet been scientifically validated?

(b)(5)

2. The 2009 NAS report suggested that the DOJ should not be the home of forensic science reform, even if advised by outside stakeholders, citing a strong potential for bias, despite well-meaning intentions. How would you respond to this?

(b)(5)

(b) (5)

3. A DOJ press release dated August 7, 2017 states: "The Department stands with the forensic science community and against efforts by some to reject reliable and admissible forensic evidence." What is the DOJ's definition of "reliable" and how is it determined?

(b) (5)

4. Given the DOJ's statement that it "stands with the forensic science community" what steps will the Forensic Science Working Group take to ensure that it will consider potential criticisms of forensic theories or practices -- which may or may not undermine entire fields of forensic science (CBLA is one past example) -- in an unbiased manner?

(b)(5)

5. Given the adversarial nature of the American justice system and your experience as a prosecutor, what factors do you think might lead prosecutors to resist attempts to limit the types of forensic evidence admissible in court and/or attempts to soften the language of certainty allowed in forensic testimony? What factors might encourage prosecutors to support such reforms?

(b)(5)

(b)(5)

6. The NCFS proposed a “Statistical Statements in Forensic Testimony,” which you ultimately voted against. At NCFS meeting #13 (April 2017), you remarked that you were concerned the statistical views document would suggest a fingerprint examiner or toolmark examiner should not be able to say “I have identified this known print to this questioned print...that a firearms examiner shouldn’t be allowed to say that this shell casing was fire from this gun.” Some forensic experts, along with respected scientists, have said that scientific evidence does not support such “absolute” or even “practical” claims of a match. Rather, they state that examiners giving testimony in court should present the chances that their assessment could be right/wrong, based on sources of potential error or uncertainty in their field. For fields where reliable numbers are not available, the suggestion is that forensic expert witnesses indicate an absence of studies. Why do you oppose adding that language to testimony?

(b)(5)

7. The Jan 2017 issue of the United States Attorneys’ Bulletin states: “In April 2015, FBI, IP, and NACDL issued a joint press release in which the FBI acknowledged that at least 90 percent of trial transcripts analyzed as part of the MHCA review contained erroneous statements. The FBI found that 26 of 28 FBI agent/analysts provided either testimony with erroneous statements or submitted laboratory reports with erroneous statements. The review found that the overstated forensic matches favored prosecutors in over 95 percent of the trials reviewed.” How will the new Forensic Science Working Group in the DOJ improve forensic expert testimony and work to prevent biased and/or erroneous testimony that tends to favor prosecutors?

(b)(5)

(b)(5)

T. Hunt Responses to Media Questions_12012017_v4

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Fri, 01 Dec 2017 16:51:31 -0500
Attachment T Hunt Re pon e to Media Que tion 12012017 v4 doc (27 5 kB)

Looks good. Two or three tiny suggestions. Then I'd send to Lauren.

-K

1. In response to the 2016 PCAST report on forensic science, the DOJ said it would “not be adopting the recommendations related to the admissibility of forensic science evidence.” As head of the new Forensic Science Working Group will you continue support this policy, and/or how will you address the fact that multiple scientific bodies (PCAST, NRC, AAAS), have concluded that many forensic methods -- including latent fingerprint, firearms/toolmarks, and bitemarks -- either lack scientific validity or have not yet been scientifically validated?

(b)(5)

2. The 2009 NAS report suggested that the DOJ should not be the home of forensic science reform, even if advised by outside stakeholders, citing a strong potential for bias, despite well-meaning intentions. How would you respond to this?



3. A DOJ press release dated August 7, 2017 states: "The Department stands with the forensic science community and against efforts by some to reject reliable and admissible forensic evidence." What is the DOJ's definition of "reliable" and how is it determined?



(b)(5)

4. Given the DOJ's statement that it "stands with the forensic science community" what steps will the Forensic Science Working Group take to ensure that it will consider potential criticisms of forensic theories or practices -- which may or may not undermine entire fields of forensic science (CBLA is one past example) -- in an unbiased manner?

(b)(5)

5. Given the adversarial nature of the American justice system and your experience as a prosecutor, what factors do you think might lead prosecutors to resist attempts to limit the types of forensic evidence admissible in court and/or attempts to soften the language of certainty allowed in forensic testimony? What factors might encourage prosecutors to support such reforms?

(b)(5)

RE: Media Responses

From: "Ehrsam, Lauren (OPA)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)> "Hudson, Andrew (OLP)" <(b) (6)>
Date: Fri, 15 Dec 2017 12:34:55 -0500
Attachment: Re pon e to Media Que tion 12042017 LE dh doc (31 06 kB)

Hi Ted,

(b)(5)

As soon as I hear back from you today, I will send it for final approval and get back to the reporter. Statement below would be from me, and the attachment would be from you.

Thank you!
Lauren

(b)(5)

From: Ehrsam, Lauren (OPA)
Sent: Monday, December 4, 2017 11:55 AM
To: Hunt, Ted (ODAG) <(b) (6)> Hudson, Andrew (OLP) <(b) (6)>
Subject: RE: Media Responses

Thank you so much, Ted! I'll work on this and circle back with questions

From: Hunt, Ted (ODAG)
Sent: Monday, December 4, 2017 11:49 AM
To: Ehrsam, Lauren (OPA) <(b) (6)> Hudson, Andrew (OLP) <(b) (6)>
Subject: Media Responses

Lauren and Drew,

Attached are responses to the questions sent

Let me know if you need anything else

Thanks,

Ted

Ted R Hunt
Senior Advisor to the Attorney General on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave NW
Washington, DC 20530

(b) (6)
(b) (6)

1. In response to the 2016 PCAST report on forensic science, the DOJ said it would “not be adopting the recommendations related to the admissibility of forensic science evidence.” As head of the new Forensic Science Working Group will you continue support this policy, and/or how will you address the fact that multiple scientific bodies (PCAST, NRC, AAAS), have concluded that many forensic methods -- including latent fingerprint, firearms/toolmarks, and bitemarks -- either lack scientific validity or have not yet been scientifically validated?

(b)(5)

2. The 2009 NAS report suggested that the DOJ should not be the home of forensic science reform, even if advised by outside stakeholders, citing a strong potential for bias, despite well-meaning intentions. How would you respond to this?

(b)(5)

3. A DOJ press release dated August 7, 2017 states: “The Department stands with the forensic science community and against efforts by some to reject reliable and admissible forensic evidence.” What is the DOJ’s definition of “reliable” and how is it determined?

(b)(5)

Given the DOJ’s statement that it “stands with the forensic science community” what steps will the Forensic Science Working Group take to ensure that it will consider potential criticisms of forensic theories or practices -- which may or may not undermine entire fields of forensic science (CBLA is one past example) -- in an unbiased manner?

(b)(5)

Given the adversarial nature of the American justice system and your experience as a prosecutor, what factors do you think might lead prosecutors to resist attempts to limit the types of forensic

evidence admissible in court and/or attempts to soften the language of certainty allowed in forensic testimony? What factors might encourage prosecutors to support such reforms?

(b)(5)

4. The NCFS proposed a “Statistical Statements in Forensic Testimony,” which you ultimately voted against. At NCFS meeting #13 (April 2017), you remarked that you were concerned the statistical views document would suggest a fingerprint examiner or toolmark examiner should not be able to say “I have identified this known print to this questioned print...that a firearms examiner shouldn’t be allowed to say that this shell casing was fire from this gun.” Some forensic experts, along with respected scientists, have said that scientific evidence does not support such “absolute” or even “practical” claims of a match. Rather, they state that examiners giving testimony in court should present the chances that their assessment could be right/wrong, based on sources of potential error or uncertainty in their field. For fields where reliable numbers are not available, the suggestion is that forensic expert witnesses indicate an absence of studies. Why do you oppose adding that language to testimony?

(b)(5)

5. The Jan 2017 issue of the United States Attorneys’ Bulletin states: “In April 2015, FBI, IP, and NACDL issued a joint press release in which the FBI acknowledged that at least 90 percent of trial transcripts analyzed as part of the MHCA review contained erroneous statements. The FBI found that 26 of 28 FBI agent/analysts provided either testimony with erroneous statements or submitted laboratory reports with erroneous statements. The review found that the overstated forensic matches favored prosecutors in over 95 percent of the trials reviewed.” How will the new Forensic Science Working Group in the DOJ improve forensic expert testimony and work to prevent biased and/or erroneous testimony that tends to favor prosecutors?

(b)(5)

FW: Media Responses

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Fri, 15 Dec 2017 12:38:40 -0500
Attachment: Re pon e to Media Que tion 12042017 LE dh doc (31 06 kB)

Attached and below i from Lauren. Take a quick look at the revi ed re pon e and let me know what you think (b)(5)

From: Ehram, Lauren (OPA)
Sent: Friday, December 15, 2017 12:35 PM
To: Hunt, Ted (ODAG) (b) (6); Hudson, Andrew (OLP) <(b) (6)>
Subject: RE: Media Responses

Duplicative Material

1. In response to the 2016 PCAST report on forensic science, the DOJ said it would “not be adopting the recommendations related to the admissibility of forensic science evidence.” As head of the new Forensic Science Working Group will you continue support this policy, and/or how will you address the fact that multiple scientific bodies (PCAST, NRC, AAAS), have concluded that many forensic methods -- including latent fingerprint, firearms/toolmarks, and bitemarks -- either lack scientific validity or have not yet been scientifically validated?

(b) (5)

(b)(5)

6. The NCFS proposed a “Statistical Statements in Forensic Testimony,” which you ultimately voted against. At NCFS meeting #13 (April 2017), you remarked that you were concerned the statistical views document would suggest a fingerprint examiner or toolmark examiner should not be able to say “I have identified this known print to this questioned print...that a firearms examiner shouldn’t be allowed to say that this shell casing was fire from this gun.” Some forensic experts, along with respected scientists, have said that scientific evidence does not support such “absolute” or even “practical” claims of a match. Rather, they state that examiners giving testimony in court should present the chances that their assessment could be right/wrong, based on sources of potential error or uncertainty in their field. For fields where reliable numbers are not available, the suggestion is that forensic expert witnesses indicate an absence of studies. Why do you oppose adding that language to testimony?

(b)(5)

7. The Jan 2017 issue of the United States Attorneys’ Bulletin states: “In April 2015, FBI, IP, and NACDL issued a joint press release in which the FBI acknowledged that at least 90 percent of trial transcripts analyzed as part of the MHCA review contained erroneous statements. The FBI found that 26 of 28 FBI agent/analysts provided either testimony with erroneous statements or submitted laboratory reports with erroneous statements. The review found that the overstated forensic matches favored prosecutors in over 95 percent of the trials reviewed.” How will the new Forensic Science Working Group in the DOJ improve forensic expert testimony and work to prevent biased and/or erroneous testimony that tends to favor prosecutors?

(b)(5)

2. The 2009 NAS report suggested that the DOJ should not be the home of forensic science reform, even if advised by outside stakeholders, citing a strong potential for bias, despite well-meaning intentions. How would you respond to this?

(b) (5)

3. A DOJ press release dated August 7, 2017 states: “The Department stands with the forensic science community and against efforts by some to reject reliable and admissible forensic evidence.” What is the DOJ’s definition of “reliable” and how is it determined?

(b) (5)

(b)(5)

4. Given the DOJ's statement that it "stands with the forensic science community" what steps will the Forensic Science Working Group take to ensure that it will consider potential criticisms of forensic theories or practices -- which may or may not undermine entire fields of forensic science (CBLA is one past example) -- in an unbiased manner?

(b)(5)

5. Given the adversarial nature of the American justice system and your experience as a prosecutor, what factors do you think might lead prosecutors to resist attempts to limit the types of forensic evidence admissible in court and/or attempts to soften the language of certainty allowed in forensic testimony? What factors might encourage prosecutors to support such reforms?

(b)(5)

(b)(5)

6. The NCFS proposed a “Statistical Statements in Forensic Testimony,” which you ultimately voted against. At NCFS meeting #13 (April 2017), you remarked that you were concerned the statistical views document would suggest a fingerprint examiner or toolmark examiner should not be able to say “I have identified this known print to this questioned print...that a firearms examiner shouldn’t be allowed to say that this shell casing was fire from this gun.” Some forensic experts, along with respected scientists, have said that scientific evidence does not support such “absolute” or even “practical” claims of a match. Rather, they state that examiners giving testimony in court should present the chances that their assessment could be right/wrong, based on sources of potential error or uncertainty in their field. For fields where reliable numbers are not available, the suggestion is that forensic expert witnesses indicate an absence of studies. Why do you oppose adding that language to testimony?

(b)(5)

7. The Jan 2017 issue of the United States Attorneys’ Bulletin states: “In April 2015, FBI, IP, and NACDL issued a joint press release in which the FBI acknowledged that at least 90 percent of trial transcripts analyzed as part of the MHCA review contained erroneous statements. The FBI found that 26 of 28 FBI agent/analysts provided either testimony with erroneous statements or submitted laboratory reports with erroneous statements. The review found that the overstated forensic matches favored prosecutors in over 95 percent of the trials reviewed.” How will the new Forensic Science Working Group in the DOJ improve forensic expert testimony and work to prevent biased and/or erroneous testimony that tends to favor prosecutors?

(b)(5)

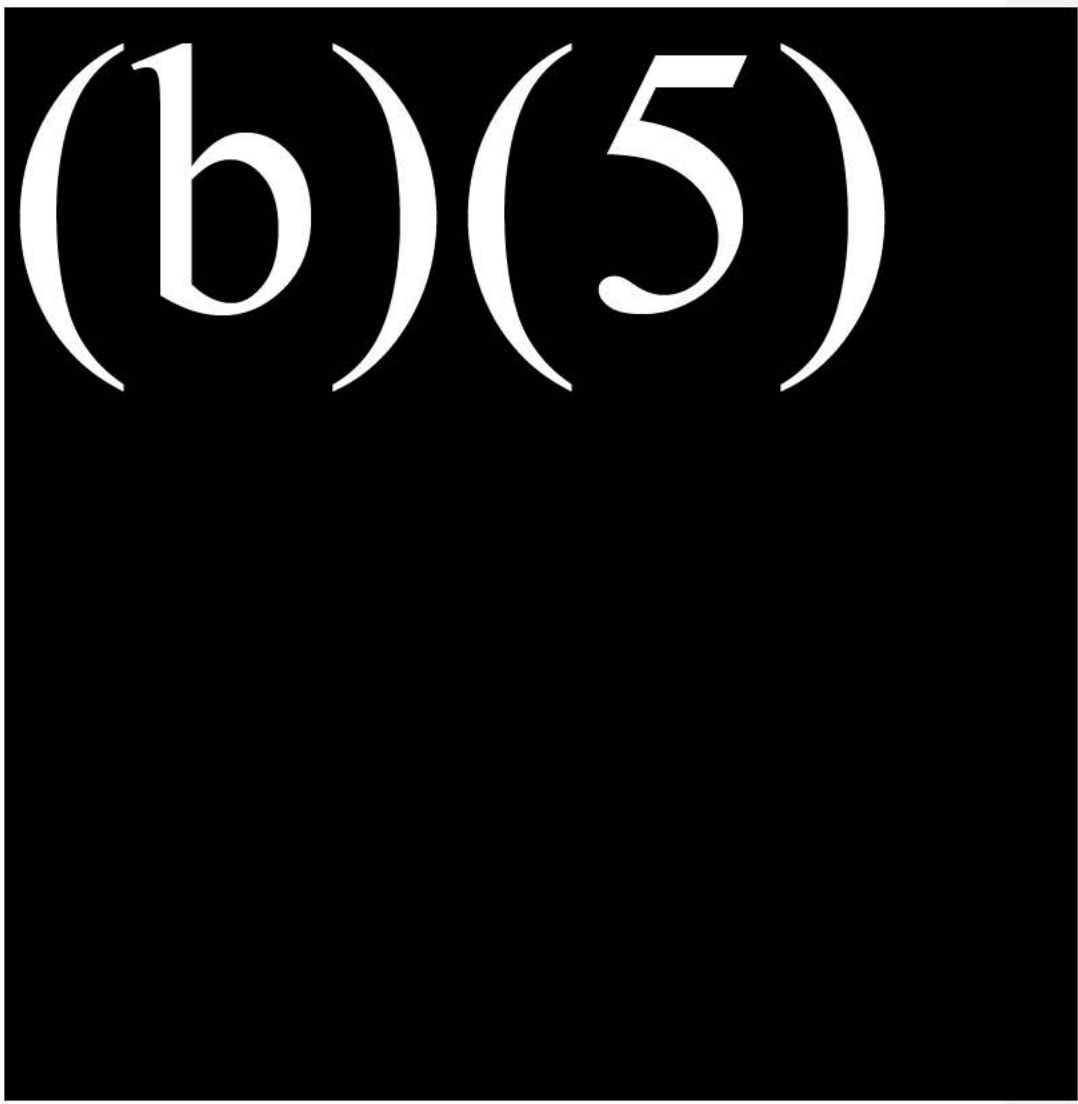
Latest Version

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Fri, 01 Dec 2017 12:26:23 -0500
Attachment T Hunt Re pon e to Media Que tion TRH Reply to KMA 12012017v3 doc (29 04 kB)

Here's the latest version. More (b)(5) . (b) (5) still needs to be confirmed.

Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave. NW
Washington, DC 20530
(202) 514-4995
Ted.hunt@usdoj.gov

1. In response to the 2016 PCAST report on forensic science, the DOJ said it would “not be adopting the recommendations related to the admissibility of forensic science evidence.” As head of the new Forensic Science Working Group will you continue support this policy, and/or how will you address the fact that multiple scientific bodies (PCAST, NRC, AAAS), have concluded that many forensic methods -- including latent fingerprint, firearms/toolmarks, and bitemarks -- either lack scientific validity or have not yet been scientifically validated?



2. The 2009 NAS report suggested that the DOJ should not be the home of forensic science reform, even if advised by outside stakeholders, citing a strong potential for bias, despite well-meaning intentions. How would you respond to this?

(b) (5)

3. A DOJ press release dated August 7, 2017 states: "The Department stands with the forensic science community and against efforts by some to reject reliable and admissible forensic evidence." What is the DOJ's definition of "reliable" and how is it determined?

(b) (5)

(b)(5)

4. Given the DOJ's statement that it "stands with the forensic science community" what steps will the Forensic Science Working Group take to ensure that it will consider potential criticisms of forensic theories or practices -- which may or may not undermine entire fields of forensic science (CBLA is one past example) -- in an unbiased manner?

(b)(5)

5. Given the adversarial nature of the American justice system and your experience as a prosecutor, what factors do you think might lead prosecutors to resist attempts to limit the types of forensic evidence admissible in court and/or attempts to soften the language of certainty allowed in forensic testimony? What factors might encourage prosecutors to support such reforms?

(b)(5)

(b)(5)

6. The NCFS proposed a “Statistical Statements in Forensic Testimony,” which you ultimately voted against. At NCFS meeting #13 (April 2017), you remarked that you were concerned the statistical views document would suggest a fingerprint examiner or toolmark examiner should not be able to say “I have identified this known print to this questioned print...that a firearms examiner shouldn’t be allowed to say that this shell casing was fire from this gun.” Some forensic experts, along with respected scientists, have said that scientific evidence does not support such “absolute” or even “practical” claims of a match. Rather, they state that examiners giving testimony in court should present the chances that their assessment could be right/wrong, based on sources of potential error or uncertainty in their field. For fields where reliable numbers are not available, the suggestion is that forensic expert witnesses indicate an absence of studies. Why do you oppose adding that language to testimony?

(b)(5)

7. The Jan 2017 issue of the United States Attorneys’ Bulletin states: “In April 2015, FBI, IP, and NACDL issued a joint press release in which the FBI acknowledged that at least 90 percent of trial transcripts analyzed as part of the MHCA review contained erroneous statements. The FBI found that 26 of 28 FBI agent/analysts provided either testimony with erroneous statements or submitted laboratory reports with erroneous statements. The review found that the overstated forensic matches favored prosecutors in over 95 percent of the trials reviewed.” How will the new Forensic Science Working Group in the DOJ improve forensic expert testimony and work to prevent biased and/or erroneous testimony that tends to favor prosecutors?

(b)(5)

Media Responses

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Ehrsam, Lauren (OPA)" <(b) (6)> "Hudson, Andrew (OLP)" <(b) (6)>
Date: Mon, 04 Dec 2017 11:48:37 -0500
Attachments: Responses to Media Questions_12042017.docx (26.98 kB)

Lauren and Drew,

Attached are responses to the questions sent

Let me know if you need anything else

Thanks,

Ted

Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave NW
Washington, DC 20530

(b) (6)
(b) (6)

RE: Media Responses

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Ehrsam, Lauren (OPA)" <(b) (6)>
Date: Fri, 15 Dec 2017 13:46:07 -0500
Attachment: Hunt Re pon e to Media Que tion 12042017 LE dh doc (31 53 kB)

Lauren,

(b)(5)




Thanks!

Ted

From: Ehrsam, Lauren (OPA)
Sent: Friday, December 15, 2017
To: Hunt, Ted (ODAG) <(b) (6)> Hudson, Andrew (OLP) <(b) (6)>
Subject: RE: Media Responses

Duplicative Material



1. In response to the 2016 PCAST report on forensic science, the DOJ said it would “not be adopting the recommendations related to the admissibility of forensic science evidence.” As head of the new Forensic Science Working Group will you continue support this policy, and/or how will you address the fact that multiple scientific bodies (PCAST, NRC, AAAS), have concluded that many forensic methods -- including latent fingerprint, firearms/toolmarks, and bite marks -- either lack scientific validity or have not yet been scientifically validated?

(b)(5)

2. The 2009 NAS report suggested that the DOJ should not be the home of forensic science reform, even if advised by outside stakeholders, citing a strong potential for bias, despite well-meaning intentions. How would you respond to this?

(b)(5)

3. A DOJ press release dated August 7, 2017 states: “The Department stands with the forensic science community and against efforts by some to reject reliable and admissible forensic evidence.” What is the DOJ’s definition of “reliable” and how is it determined?

(b)(5)

Given the DOJ’s statement that it “stands with the forensic science community” what steps will the Forensic Science Working Group take to ensure that it will consider potential criticisms of forensic theories or practices -- which may or may not undermine entire fields of forensic science (CBLA is one past example) -- in an unbiased manner?

(b)(5)

Given the adversarial nature of the American justice system and your experience as a prosecutor, what factors do you think might lead prosecutors to resist attempts to limit the types of forensic

evidence admissible in court and/or attempts to soften the language of certainty allowed in forensic testimony? What factors might encourage prosecutors to support such reforms?

(b)(5)

4. The NCFS proposed a “Statistical Statements in Forensic Testimony,” which you ultimately voted against. At NCFS meeting #13 (April 2017), you remarked that you were concerned the statistical views document would suggest a fingerprint examiner or toolmark examiner should not be able to say “I have identified this known print to this questioned print...that a firearms examiner shouldn’t be allowed to say that this shell casing was fire from this gun.” Some forensic experts, along with respected scientists, have said that scientific evidence does not support such “absolute” or even “practical” claims of a match. Rather, they state that examiners giving testimony in court should present the chances that their assessment could be right/wrong, based on sources of potential error or uncertainty in their field. For fields where reliable numbers are not available, the suggestion is that forensic expert witnesses indicate an absence of studies. Why do you oppose adding that language to testimony?

(b)(5)

5. The Jan 2017 issue of the United States Attorneys’ Bulletin states: “In April 2015, FBI, IP, and NACDL issued a joint press release in which the FBI acknowledged that at least 90 percent of trial transcripts analyzed as part of the MHCA review contained erroneous statements. The FBI found that 26 of 28 FBI agent/analysts provided either testimony with erroneous statements or submitted laboratory reports with erroneous statements. The review found that the overstated forensic matches favored prosecutors in over 95 percent of the trials reviewed.” How will the new Forensic Science Working Group in the DOJ improve forensic expert testimony and work to prevent biased and/or erroneous testimony that tends to favor prosecutors?

(b)(5)

NIST

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Wed, 23 Aug 2017 18:08:39 -0400

Description

In 2013, the National Institute of Standards and Technology (NIST) and U.S. Department of Justice (DOJ) announced an interagency initiative to strengthen forensic science: establishment of a National Commission on Forensic Science (NCFS) and development of the Organization of Scientific Area Committees for Forensic Science (OSAC). NCFS held thirteen meetings in Washington, DC between February 2014 and April 2017 before its second term expired. A total of 43 work products were approved along with a summary and future needs document. OSAC seeks to improve forensic practices by facilitating the development and promulgation of technically sound consensus-based documentary standards that can be used by accrediting bodies in future audits of forensic laboratories. OSAC is a NIST-organized effort and it is intended to be ongoing. This presentation will also review recent requests of NIST from the President's Council of Advisors on Science and Technology (PCAST) to explore scientific foundations of forensic science disciplines. Other presentations in this session will explore technical and programmatic issues and activities within NIST and the Department of Defense

This is from John Butler's presentation at the Fed Identity Forum on Sept. 13. I assume this is a reference to the PCAST Report itself and nothing more than that?

Ted R. Hunt
Senior Advisor on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave, NW
Washington, D.C. 20530

(b) (6)
(b) (6)

Advisory Committee Points

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Wed, 04 Oct 2017 18:04:29 -0400
Attachment: T Hunt PCAST Talking Point doc (24 22 kB)

Here's what I'm thinking so far.

Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave, NW
Washington, D.C. 20530

(b) (6)
(U) (0)

RE: Introduction

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Wed, 16 Aug 2017 19:11:56 -0400

Hi Ted,

We should reply all how about I send something like?

(b)(5)

[REDACTED]

[REDACTED]

From: Gamette, Matthew [mailto:(b)(6) Idaho]
Sent: Tuesday, August 15, 2017 11:35 PM
To: Antell, Kira M. (OLP) <(b) (6)> Hunt, Ted (ODAG) <(b) (6)> Ken Melson Home
(b) (6)
Cc: Pate Skene <(b) (6)>
Subject: FW: Introduction

Kira, Ted, and Ken,

Tonight Ray and I met with Dr. Pate Skene. He is a Neurobiology professor from Duke that recently completed law school and is currently doing a fellowship with AAAS at the Federal Judicial Center. Dr. Skene became interested in forensic science through the PCAST report and is doing a report as his final project at FJC before he goes back to Duke in a month. He hopes the report he writes will educate and inform judges and attorneys (mostly about expert testimony by forensic scientists). He is interested in neurobiology research as it relates to decision making by attorneys and judges and forensic scientists. We talked with him about a survey he is interested in doing and we are helping him refine some questions that will address the major questions that he has for forensic science labs. I think after attending the recent NIST Error Management Symposium he is most interested in proficiency testing and what labs do regarding blind proficiency testing (and what some of the factors are that cause labs not to implement blind proficiency testing). We also recommended that he look into what labs are doing with technical review.

I recommended that he also visit with all of you because you may be able to help him from a lawyer perspective interested in this issue.

J. H. Pate Skene, JD, PhD
Department of Neurobiology
427F Bryan Research Bldg.
Duke University Medical Center
Durham, NC 27710-3209
Tel. (b) (6)
Cell (b) (6)

Matthew Gamette, M.S., C.P.M.
Laboratory System Director
Idaho State Police Forensic Services
(b) (6)
(b)(6) Idaho

CONFIDENTIALITY NOTICE: This e-mail is intended only for the personal and confidential use of the individual(s) named as a recipient (or the employee or agent responsible to deliver it to the intended recipient) and is covered by the Electronic Communications Privacy Act, 18 U.S.C. §§ 2510-2521. It may contain information that is privileged, confidential and/or protected from disclosure under applicable law including, but not limited to, the attorney-client privilege and/or work product doctrine. If you are not the intended recipient of this transmission, please notify the sender immediately by telephone. Do not deliver, distribute or copy this transmission, disclose its content or take any action in reliance on the information it contains.

Re: Introduction

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Fri, 18 Aug 2017 13:02:25 -0400

(b)(5)

On Aug 18, 2017, at 12:41 PM, Hunt, Ted (ODAG) <(b) (6)> wrote:

(b)(5)

On Aug 18, 2017, at 5:16 AM, Antell, Kira M. (OLP) <(b) (6)> wrote:

(b)(5)

From: Pate Skene [mailto:(b) (6)]
Sent: Wednesday, August 16, 2017 9:29 PM
To: Gamette, Matthew <(b) (6) Idaho>; Antell, Kira M. (OLP) <(b) (6)>; Hunt, Ted (ODAG) <(b) (6)>; Ken Melson Home <(b) (6)>
Subject: Re: Introduction

Matthew, thank you for the e introduction

Kira, Ted, and Ken,

It is nice to e-meet you. For simplicity, I will send this first note to all of you, then hope to find an opportunity to touch base with you individually if you're open to it.

As Matthew explained, I will be returning to Duke in September after a one-year leave at the FJC. My work this year is part of a broader research program on legal decision making that I will continue on my return to Duke. That includes the work Matthew mentioned on best practices in forensic labs, but also the way prosecutors and jurors understand forensic testimony, including the way experts explain their methods and articulate their conclusions.

One of my major goals this year has been to understand the perspectives of various stakeholders in the debates over scientific validity and Daubert review of forensic testimony. As a long time bench scientist (molecular biology and neurobiology) but comparatively new lawyer, I have a pretty good sense of how academic scientists view this issue, but I am eager to connect with people in the courts, DOJ and other prosecutors, and forensic practitioners.

I would very grateful if any of you has time for lunch, coffee, or just a brief chat. If possible, I would love to talk before I return to North Carolina on Labor Day. However, I realize that August may not be an ideal time to set up meetings. If you do not have

time to chat in August, I will be happy to find another time. I have become very comfortable with periodic commutes to and from North Carolina, and I plan to make several short trips back to DC in the fall.

Thank you for any time you can spare to share your perspectives.

Best,

Pate Skene

J. H. Pate Skene, JD, PhD
Department of Neurobiology
427F Bryan Research Bldg.
Duke University Medical Center
Durh [REDACTED] 0-3209
Tel. (b) (6) [REDACTED]
Cell (b) (6) [REDACTED]

From: Gamette, Matthew <[REDACTED] (b)(6) Link>
Sent: Tuesday, August 15, 2017 11:35 PM
To: 'Antell, Kira M. (OLP)'; [REDACTED] (b) (6); Ken Melson Home
Cc: Pate Skene
Subject: FW: Introduction

Duplicative Material See Bates Stamp 20220314-09286

Re: Introduction

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Tue, 22 Aug 2017 18:12:12 -0400

(b)(5)

On Aug 22, 2017, at 5:19 PM, Hunt, Ted (ODAG) <(b) (6)> wrote:

(b)(5)

From: Pate Skene [\(mailto:\(b\) \(6\)\)](mailto:(b) (6))
Sent: Tuesday, August 22, 2017 3:32 PM
To: Hunt, Ted (ODAG) <(b) (6)>
Subject: Re: Introduction

Ted,

Thanks for taking time for this at such a busy time. I know you must have a lot on your plate with the new job. Whenever you figure out some dates and times, just let me know. I look forward to talking any time.

Best,

Pate

J. H. Pate Skene, JD, PhD
Department of Neurobiology
427F Bryan Research Bldg.
Duke University Medical Center
Durham, NC 27710 3209
Tel. (b) (6)
Cell (b) (6)

From: Hunt, Ted (ODAG) <(b) (6)>
Sent: Tuesday, August 22, 2017 11:07 AM
To: Pate Skene
Subject: RE: Introduction

Pate,

I apologize for the late response. Last week was my first week in the office and I was physically out much of the week.

Thanks very much for your email. We would be very happy to meet with you and discuss the mutual topics of interest you raised. Kira was also gone much of last week and now that she is back we will work to find a time that works for everyone.

We will get back in touch this week with some possible dates and times.

Thanks for reaching out.

Ted

From: Pate Skene [mailto: (b) (6)]
Sent: Wednesday, August 16, 2017 9:29 PM
To: Gamette, Matthew < (b) (6) Idaho>; Antell, Kira M. (OLP) < (b) (6)>; Hunt, Ted (ODAG) < (u) (u)>; Ken Melson Home < (b) (6)>
Subject: Re: Introduction

Duplicative Material See Bates Stamp 20220314-09290

Re: Introduction

From: "Goldsmith, Andrew (ODAG)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Cc: "Murray, Michael (ODAG)" <(b) (6)>, "Antell, Kira M. (OLP)" <(b) (6)>
"Brinkley, Winnie (ODAG)" <(b) (6)>
Date: Wed, 23 Aug 2017 10:34:02 -0400

Ted - thanks for the head's up. I'd gladly participate. Good days for me are this Friday and next Monday or Tuesday. Not all time on the day, but most of the day are free Andrew

On Aug 23, 2017, at 10:30 AM, Hunt, Ted (ODAG) <(b) (6)> wrote:

Duplicative Material See Bates Stamp 20220314-09293 and 20220314-09294



RE: Introduction

From: "Murray, Michael (ODAG)" <(b) (6)>
To: "Goldsmith, Andrew (ODAG)" <(b) (6)> "Hunt, Ted (ODAG)" <(b) (6)>
Cc: "Antell, Kira M. (OLP)" <(b) (6)> "Brinkley, Winnie (ODAG)" <(b) (6)>
Date: Thu, 24 Aug 2017 10:38:20 -0400

Ted,
Thanks for the email. I will defer to you and Andrew, as this appears to fall mostly in your lane.
Thanks,
Mike

From: Goldsmith, Andrew (ODAG)
Sent: Wednesday, August 23, 2017 10:34 AM
To: Hunt, Ted (ODAG) <(b) (6)>
Cc: Murray, Michael (ODAG) <(b) (6)>; Antell, Kira M. (OLP) <(b) (6)> Brinkley, Winnie (ODAG) <(b) (6)>
Subject: Re: Intro

Ted - thanks for the head's up. I'd gladly participate. Good days for me are this Friday and next Monday or Tuesday. Not all times on those days, but most of those days are free. - Andrew

On Aug 23, 2017, at 10:30 AM, Hunt, Ted (ODAG) <(b) (6)> wrote:

Dr. Pate Skene (details in chain below), who is currently engaged in a fellowship with the American Association for the Advancement of Science (AAAS) at the Federal Judicial Center, and is preparing a report as his final project at the FJC (which may contain information about forensic science proficiency testing and specifically why the vast majority of forensic labs do not conduct blind testing), has asked to meet with me and Kira before he returns to Duke. He has asked to meet before Labor Day, if possible.

I'm looping both of you in since you have a piece of the Judicial portfolio. Please advise if you would like to participate in the meeting or discuss any concerns before we meet with Dr. Skene, as well as your availability to meet before the end of next week. I'd like to respond to him by the end of the day, if possible.

Thanks,

Ted

From: Pate Skene [[mailto:\(b\) \(6\)](#)]
Sent: Tuesday, August 22, 2017 3:32 PM
To: Hunt, Ted (ODAG) <(b) (6)>
Subject: Re: Introduction

Duplicative Material See Bates Stamp 20220314-09293 and 20220314-09294

Re: Introduction

From: "Goldsmith, Andrew (ODAG)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Cc: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Thu, 24 Aug 2017 19 22 45 -0400

Thank you, but Pate isn't on this thread

Sent from my iPhone - please excuse any typos.

On Aug 24, 2017, at 7:16 PM, Hunt, Ted (ODAG) <(b) (6)> wrote:

Pate, let's set this for Monday at 3:00 p.m. We're on the 4th floor. Kira will reserve a meeting room. We look forward to talking to you Monday

On Aug 24, 2017, at 6:57 PM, Goldsmith, Andrew (ODAG) <(b) (6)> wrote:

Folk, any chance we can steer this to Monday at 3 in stead?

From: Pate Skene [\(mailto:\(b\) \(6\)\)](mailto:(b) (6))
Sent: Thursday, August 24, 2017 6:55 PM
To: Hunt, Ted (ODAG) <(b) (6)>
Cc: Goldsmith, Andrew (ODAG) <(b) (6)>; Antell, Kira M. (OLP) <(b) (6)>
Subject: Re: Introduction

Hi Ted,

That sounds great. I can make any of those times, but tomorrow at 4 pm or Monday at 3 pm would be best for me. How about tomorrow 8/25 at 4 00 pm? And how do I find your office?

Thanks for lining this up,

Pate

J. H. Pate Skene, JD, PhD
Department of Neurobiology
427F Bryan Research Bldg.
Duke University Medical Center
Durham, NC 27710 3209
Tel. (b) (6)
Cell (b) (6)

From: Hunt, Ted (ODAG) <(b) (6)>
Sent: Thursday, August 24, 2017 5:37 PM
To: Pate Skene
Cc: Goldsmith, Andrew (ODAG); Antell, Kira M (OLP)
Subject: RE: Introduction

Hi Pate,

I've come up with a few potential times that I hope can work with your schedule.

We can meet here tomorrow, 8/25 at 4:00 p.m.; Monday, 8/28 at either 1:00 p.m. or 3:00 p.m.; or Tuesday 8/29, before noon.

Let me know what works best for you.

Thanks,

Ted

From: Pate Skene [(b) (6)] <[redacted]@neuro.duke.edu>
Sent: Tuesday, August 22, 2017 3:32 PM
To: Hunt, Ted (ODAG) <[redacted]> (b) (6)
Subject: Re: Introduction

Duplicative Material See Bates Stamp 20220314-09293 and 20220314-09294



Re: Introduction

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Cc: "Goldsmith, Andrew (ODAG)" <(b) (6)>
Date: Thu, 24 Aug 2017 19:27:07 -0400

Hi Ted,

You didn't send that to Pate. Just me and and Andrew.

K

On Aug 24, 2017, at 7:16 PM, Hunt, Ted (ODAG) <(b) (6)> wrote:

Pate, let's meet this for Monday at 3:00 p.m. We're on the (b) (6) floor. Kira will reserve a meeting room. We look forward to talking to you Monday.

On Aug 24, 2017, at 6:57 PM, Goldsmith, Andrew (ODAG) <(b) (6)> wrote:

Duplicative Material See Bates Stamp 20220314-09293 and 20220314-09294



Re: Introduction

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: Pate Skene <(b) (6)>
Cc: "Hunt, Ted (ODAG)" <(b) (6)> "Goldsmith, Andrew (ODAG)" <(b) (6)>
Date: Thu, 24 Aug 2017 19:38:23 -0400

Hi Pate,

I'll send a calendar invite with building access details, address, and room location tomorrow.

Thank ,
Kira Antell

On Aug 24, 2017, at 7:36 PM, Hunt, Ted (ODAG) <(b) (6)> wrote:

Pate, let's meet at 3:00 p.m. Monday. We are on the (b) (6). We will reserve a meeting room and send that information out tomorrow.

Thank ,

Ted

On Aug 24, 2017, at 5:37 PM, Hunt, Ted (ODAG) <(b) (6)> wrote

Duplicative Material See Bates Stamp 20220314-09294

From: Pate Skene [[mailto:\(b\) \(6\)](#)]
Sent: Tuesday, August 22, 2017 3:32 PM
To: Hunt, Ted (ODAG) <(b) (6)>
Subject: Re: Introduction

Duplicative Material See Bates Stamp 20220314-09293 and 20220314-09294

RE: Introduction

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Gamette, Matthew" <(b) (6) Idaho>
Date: Wed, 16 Aug 2017 09:13:36 -0400

Hi Matthew,

Thanks for the information I got a heads up about Dr. Skene a few days ago and would be interested in meeting with him – also, FYI, my office number at DOJ is (b) (6).

Ted

From: Gamette, Matthew [mailto:(b) (6) Idaho]
Sent: Tuesday, August 15, 2017 11:35 PM
Antell, Kira M (OLP) (b) (6) Hunt, Ted (ODAG) (b) (6) Ken Melson Home
(b) (6)
Cc: Pate Skene (b) (6)
Subject: FW: Introduction

Duplicative Material See Bates Stamp 20220314-09286

RE: Introduction

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Murray, Michael (ODAG)" <(b) (6)>
Date: Thu, 24 Aug 2017 18:25:57 -0400

Ok, thank you Mike

From: Murray, Michael (ODAG)
Sent: Thursday, August 24, 2017 10:38 AM
To: Goldsmith, Andrew (ODAG) <(b) (6)>; Hunt, Ted (ODAG) <(b) (6)>
Cc: Antell, Kira M (OLP) <(b) (6)>; Brinkley, Winnie (ODAG) <(b) (6)>
Subject: RE: Introduction

Ted,
Thanks for the email. I will defer to you and Andrew, as this appears to fall mostly in your lane.
Thanks,
Mike

From: Goldsmith, Andrew (ODAG)
Sent: Wednesday, August 23, 2017 10:38 AM
To: Hunt, Ted (ODAG) <(b) (6)>
Cc: Murray, Michael (ODAG) <(b) (6)>; Antell, Kira M. (OLP) <(b) (6)>; Brinkley, Winnie (ODAG) <(b) (6)>
Subject: Re: Introduction

Ted thanks for the head's up I'd gladly participate Good days for me are this Friday and next Monday or Tuesday Not all times on those days, but most of those days are free Andrew

On Aug 23, 2017, at 10:30 AM, Hunt, Ted (ODAG) <(b) (6)> wrote

Dr. Pate Skene (details in chain below), who is currently engaged in a fellowship with the American Association for the Advancement of Science (AAAS) at the Federal Judicial Center, and is preparing a report as his final project at the FJC (which may contain information about forensic science proficiency testing and specifically why the vast majority of forensic labs do not conduct blind testing), has asked to meet with me and Kira before he returns to Duke. He has asked to meet before Labor Day, if possible.

I'm looping both of you in since you have a piece of the Judicial portfolio. Please advise if you would like to participate in the meeting or discuss any concerns before we meet with Dr. Skene, as well as your availability to meet before the end of next week. I'd like to respond to him by the end of the day, if possible.

Thanks,

Ted

From: Pate Skene [[mailto:\(b\) \(6\)@fjc.gov](mailto:(b) (6)@fjc.gov)]
Sent: Tuesday, August 22, 2017 3:32 PM
To: Hunt, Ted (ODAG) <(b) (6)>
Subject: Re: Introduction

Duplicative Material See Bates Stamp 20220314-09293 and 20220314-09294

Re: Introduction

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Goldsmith, Andrew (ODAG)" <(b) (6)>
Cc: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Thu, 24 Aug 2017 19:25:11 -0400

Cell phone mi cue Will try again

On Aug 24, 2017, at 7:22 PM, Goldsmith, Andrew (ODAG) <(b) (6)> wrote:

Thank , but Pate i n't on thi thread

Sent from my iPhone - please excuse any typos.

On Aug 24, 2017, at 7:16 PM, Hunt, Ted (ODAG) <(b) (6)> wrote:

Pate, let's set this for Monday at 3:00 p.m. We're on the (b) (6). Kira will reserve a meeting room. We look forward to talking to you Monday

On Aug 24, 2017, at 6:57 PM, Goldsmith, Andrew (ODAG) <(b) (6)> wrote:

Duplicative Material See Bates Stamp 20220314-09293 and 20220314-09294

RE: Introduction

From: "Gamette, Matthew" <(b)(6) Idaho [REDACTED]>
To: "Hunt, Ted (ODAG)" <(b)(6) [REDACTED]>
Date: Wed, 16 Aug 2017 21:18:10 -0400

Thanks Ted I look forward to working with you in this new capacity I have been very impressed by all the people at OLP and OAG and ODAG. I really appreciate working with Chad and Kira. I think you will love working there. Let me know if there is anything I or CFSO can do for you I have always enjoyed your perspective on things and your willingness to speak up in challenging circumstances. I will be in touch soon about the DEA meeting.

Matthew Gamette, M.S., C.P.M.
Laboratory System Director
Idaho State Police Forensic Services

(b)(6) [REDACTED]
(b)(6) Idaho [REDACTED]

CONFIDENTIALITY NOTICE: This e-mail is intended only for the personal and confidential use of the individual(s) named as recipients (or the employee or agent responsible to deliver it to the intended recipient) and is covered by the Electronic Communications Privacy Act, 18 U.S.C. §§ 2510-2521. It may contain information that is privileged, confidential and/or protected from disclosure under applicable law including, but not limited to, the attorney client privilege and/or work product doctrine. If you are not the intended recipient of this transmission, please notify the sender immediately by telephone. Do not deliver, distribute or copy this transmission, disclose its contents or take any action in reliance on the information it contains.

From: Hunt, Ted (ODAG) [mailto:(b)(6) [REDACTED]]
Sent: Wednesday, August 16, 2017
To: Gamette, Matthew <(b)(6) Idaho [REDACTED]>
Subject: RE: Introduction

Hi Matthew,

Thanks for the information – I got a heads up [REDACTED] [REDACTED] a few days ago and would be interested in meeting with him – also, FYI, my office number at DOJ is (b)(6) [REDACTED].

Ted

From: Gamette, Matthew [mailto:(b)(6) Idaho [REDACTED]]
Sent: Tuesday, August 15, 2017 11:35 PM
To: Antell, Kira M. (OLP) [REDACTED] (b)(6) Hunt, Ted (ODAG) [REDACTED] (b)(6) Ken Melson Home [REDACTED]
<(b)(6) [REDACTED]>
Cc: Pate Skene [REDACTED] (b)(6) [REDACTED]
Subject: FW: Introduction

Duplicative Material See Bates Stamp 20220314-09286

Re: Introduction

From: Pate Skene <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Cc: "Goldsmith, Andrew (ODAG)" <(b) (6)> "Antell, Kira M. (OLP)" <(b) (6)>
Date: Thu, 24 Aug 2017 19:39:50 -0400

3:00 pm on Monday it i I look forward to seeing y'all then
Pate

J. H. Pate Skene, JD, PhD
Department of Neurobiology
427F Bryan Research Bldg.
Duke University Medical Center
Durham, NC 27710-3209
Tel. (b) (6)
Cell (b) (6)

From: Hunt, Ted (ODAG) <(b) (6)>
Sent: Thursday, August 24, 2017 7:36 PM
To: Pate Skene
Cc: Goldsmith, Andrew (ODAG); Antell, Kira M. (OLP)
Subject: Re: Introduction

Pate, let's meet at 3:00 p.m. Monday. We are on the (b) (6). We will reserve a meeting room and send that information out tomorrow.

Thank ,

Ted

On Aug 24, 2017, at 5:37 PM, Hunt, Ted (ODAG) (b) (6) wrote

Duplicative Material See Bates Stamp 20220314-09294 and 20220314-09333



Response-Epstein Letter

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Tue, 10 Apr 2018 10:30:57 -0400
Attachment Hunt Edit Re pon e to Ep tein Letter 04102018 DRAFT doc (22.72 kB)

Draft response...

Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave. NW
Washington, DC 20530

(b) (6)
(b) (6)

Hunt Edits-Response to Epstein Letter_04102018 DRAFT_KMA

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Tue, 10 Apr 2018 20:04:21 -0400
Attachment Hunt Edit Re pon e to Ep tein Letter 04102018 DRAFT KMA doc (26 84 kB)

Hi Ted,

My suggested edits in redline. I did some formatting stuff to get it to two pages.

LMK what you think

-K

Rules Committees Forensics Proposals

Where: Kira and Ted to call Nelson at (b) (6)
When: Wed Oct 18 15:00:00 2017 -04:00
Until: Wed Oct 18 15:30:00 2017 -04:00
Organizer: Common Name Antell, Kira M (OLP) MAILTO:(b) (6)
Required Attendees: ROLE=REQ-PARTICIPANT PARTSTAT=NEEDS-ACTION RSVP=TRUE Common Name Nel on Bunn MAILTO:nbunn@ndaajustice.org
Optional Attendees: ROLE=OPT-PARTICIPANT PARTSTAT=NEEDS-ACTION RSVP=TRUE Common Name=Hunt, Ted (ODAG) MAILTO:(b) (6)

From: Nelson Bunn [mailto:nbunn@ndaajustice.org]
Sent: Tuesday, October 17, 2017 12:02 PM
To: Antell, Kira M. (OLP) <(b) (6)> mailto:(b) (6)
Cc: Hunt, Ted (ODAG) <(b) (6)> mailto:(b) (6)
Subject: Re: Rules Committees Forensics Proposals

I've got another meeting during that time this afternoon. Would 3pm work tomorrow afternoon?

Nelson

Nel on O Bunn, Jr
Acting Executive Director
National District Attorneys Association
1400 Crystal Drive, Suite 330
Arlington, VA 22202
O: (b) (6)
C: (b) (6)
nbunn@ndaajustice.org<mailto:nbunn@ndaajustice.org>

From: Kira Antell <(b) (6)> mailto:(b) (6)
Date: Tuesday, Oct 17, 2017 12:02 PM
To: Nel on Bunn nbunn@ndaajustice.org mailto:nbunn@ndaajustice.org
Cc: "Hunt, Ted (ODAG)" <(b) (6)> mailto:(b) (6)
Subject: RE: Rules Committees Forensics Proposals

Hi Nelson,

Are you free this afternoon between 2:00 and 3:00 or tomorrow after 1:00? If not, let me know when would be convenient for a quick call.

Thanks,
Kira

From: Nelson Bunn [mailto:nbunn@ndaajustice.org]
Sent: Sunday, October 15, 2017 12:27 PM
To: Antell, Kira M. (OLP) <(b) (6)> mailto:(b) (6)
Cc: Hunt, Ted (ODAG) <(b) (6)> mailto:(b) (6)
Subject: Re: Rules Committees Forensics Proposals

Hey Kira,

Thanks for flagging both of these items for us. I'm more than happy to chat this week as well if you could just let me know some good days and times for you.

Nelson

Nelson O. Bunn, Jr.
Acting Executive Director
National District Attorneys Association
1400 Crystal Drive, Suite 330
Arlington, VA 22202
O: (b) (6)
C: (b) (6)
nbunn@ndaajustice.org<mailto:nbunn@ndaajustice.org>

From: Kira Antell <(b) (6)>mailto:(b) (6)>
Date: Saturday, October 14, 2017 at 11:52 AM
To: Nelson Bunn <nbunn@ndaaijustice.org<mailto:nbunn@ndaaijustice.org>>
Cc: "Hunt, Ted (ODAG)" <(b) (6)>mailto:(b) (6)>
Subject: Rules Committees Forensics Proposals

Hi Nelson,

I hope you are well. I know NDAA has many members interested in efforts to restrict the use of forensic evidence in court. As such, I thought you would be interested into two proposals pending before Federal Rules Committees. They are both at very early stages.

The first link is to materials available on the AO's website about the Advisory Committee on Evidence's upcoming meeting. That committee is holding a mini-conference in Boston on 10/27 on forensic science in light of the PCAST report. The Reporter has made an initial suggestion that a new Federal Rule of Evidence to limit forensic expert testimony could be appropriate. I will be attending that meeting.
<http://www.uscourts.gov/rules-policies/archives/agenda-books/advisory-committee-rules-evidence-october-2017> (Tab 9)

The second link is to a related proposal before the Advisory Committee on Criminal Rules to change Rule 16 on disclosure of expert testimony. While the proposed change would not be limited to forensic experts, it is certainly tied to forensics.

http://www.uscourts.gov/sites/default/files/2017-10-criminal-agenda-book_0.pdf (Tab 6)

I'm in the office next week and would be happy to discuss these proposals with you.

Thanks,
Kira

Kira Antell
Senior Counsel
Office of Legal Policy
U.S. Department of Justice
950 Pennsylvania Avenue, NW
Washington, DC 20530

(b) (6)
(b) (6)

RE: Rules Committees Forensics Proposals

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Wed, 18 Oct 2017 14:42:58 -0400

Yes, I'll come down.

From: Antell, Kira M (OLP)
Sent: Wednesday, October 18, 2017 2:38 PM
To: Hunt, Ted (ODAG) (b) (6)
Subject: RE: Rules Committees Forensics Proposals

Want to take this from the small OLP conference room?

Original Appointment

From: Antell, Kira M. (OLP)
Sent: Tuesday, October 17, 2017 3:56 PM
To: Antell, Kira M. (OLP); Nelson Bunn
Cc: Hunt, Ted (ODAG)
Subject: Rules Committees Forensics Proposals
When: Wednesday, October 18, 2017 3:00 PM - 3:30 PM (UTC 05:00) Eastern Time (US & Canada)
Where: Kira and Ted to call Nelson at (b) (6)

From: Nelson Bunn [[\(mailto:\(b\) \(6\)\)](mailto:(b) (6))]
Sent: Tuesday, October 17, 2017 12:02 PM
To: Antell, Kira M. (OLP) <(b) (6)>
Cc: Hunt, Ted (ODAG) <(b) (6)>
Subject: Re: Rules Committees Forensics Proposals

Duplicative Material see bates stamp 20220314-09666 to 20220314-09667



RE: FRE Spring Meeting Talkers_04202018

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Fri, 20 Apr 2018 11:26:21 -0400
Attachment Hunt Addition FRE Spring Meeting Talker 04202018 doc (33 84 kB)

I added a couple point (red font) end of page 2

From: Antell, Kira M. (OLP)
Sent: Friday, April 20, 2018 9:24 AM
To: Hunt, Ted (ODAG) <(b) (6)>
Subject: FRE Spring Me 18

Hi Ted,

Can you please review these revised talkers etc? I'd like to send to Rob today.

Thanks,
K

STRMix-PCAST

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Fri, 26 Jan 2018 09:50:01 -0500
Attachment Internal Validation of STRMi Multi Lab Re pon e to PCAST pdf (1.65 MB)

Bedtime reading.

Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave. NW
Washington, DC 20530

(b) (6)
(U) (0)



Research paper

Internal validation of STRmix™ – A multi laboratory response to PCAST



Jo-Anne Bright^{a,*}, Rebecca Richards^a, Maarten Kruijver^a, Hannah Kelly^a, Catherine McGovern^a, Alan Magee^b, Andrew McWhorter^c, Anne Cieccko^d, Brian Peck^e, Chase Baumgartner^f, Christina Buettner^g, Scott McWilliams^g, Claire McKenna^h, Colin Gallacherⁱ, Ben Mallinderⁱ, Darren Wright^j, Deven Johnson^k, Dorothy Catella^l, Eugene Lien^m, Craig O'Connor^m, George Duncanⁿ, Jason Bundy^o, Jillian Echard^p, John Lowe^q, Joshua Stewart^r, Kathleen Corrado^s, Sheila Gentile^s, Marla Kaplan^t, Michelle Hassler^u, Naomi McDonald^v, Paul Hulme^w, Rachel H. Oefelein^x, Shawn Montpetit^y, Melissa Strong^y, Sarah Noël^z, Simon Malsom^A, Steven Myers^B, Susan Welti^C, Tamyra Moretti^D, Teresa McMahon^E, Thomas Grill^F, Tim Kalafut^G, MaryMargaret Greer-Ritzheimer^H, Vickie Beamer^I, Duncan A. Taylor^{J,K}, John S. Buckleton^{a,L}

^a Institute of Environmental Science and Research Limited, Private Bag 92021, Auckland, 1142, New Zealand

^b Forensic Science Ireland, Ireland

^c Texas Department of Public Safety, Houston Laboratory, United States

^d Midwest Regional Forensic Laboratory, Andover, MN, United States

^e Centre of Forensic Sciences, Toronto, Canada

^f Texas Department of Public Safety, Austin Laboratory, United States

^g Wyoming State Crime Laboratory, United States

^h Austin Police Department, City of Austin, TX, United States

ⁱ Scottish Police Authority (SPA), United Kingdom

^j Idaho State Police Forensic Services, United States

^k Sacramento District Attorney's Office Laboratory of Forensic Services, CA, United States

^l Oakland County Sheriff's Office, MI, United States

^m New York City Office of Chief Medical Examiner (OCME), United States

ⁿ Broward Sheriff's Office Crime Laboratory, FL, United States

^o Florida Department of Law Enforcement, United States

^p Connecticut DESPP Division of Scientific Services, United States

^q Key Forensic Services Ltd., Warrington Laboratory, United Kingdom

^r Texas Department of Public Safety, Corpus Christi Laboratory, United States

^s Onondaga County Center for Forensic Sciences, NY, United States

^t Oregon State Police Laboratory (OSP), United States

^u San Diego County Sheriff's Regional Crime Laboratory, United States

^v Texas Department of Public Safety, Lubbock Laboratory, United States

^w Cellmark Forensic Services, United Kingdom

^x DNA Labs International, United States

^y San Diego Police Department Crime Laboratory, CA, United States

^z Laboratoire de sciences judiciaires et de médecine légale (LSJML) Montréal, Canada

^A Key Forensic Services Ltd., Norwich Laboratory, United Kingdom

^B California Department of Justice Bureau of Forensic Services, United States

^C Department of Forensic Sciences Laboratory, Washington DC (DFS), United States

^D Federal Bureau of Investigation (FBI), United States

^E Forensic Science Northern Ireland, Northern Ireland

^F Erie County Central Services Laboratory, Buffalo, NY, United States

^G US Army Criminal Investigation Laboratory (USACIL), United States

^H DuPage County Sheriff's Crime Laboratory, IL, United States

^I Scottsdale Police Department Crime Laboratory, AZ, United States

^J Forensic Science South Australia, 21 Divett Place, Adelaide, SA 5000, Australia

^K School of Biological Sciences, Flinders University, GPO Box 2100, Adelaide, SA 5001, Australia

^L University of Washington, Department of Biostatistics, Seattle, WA 98195, United States

* Corresponding author.

E-mail address: jo.bright@esr.cri.nz (J.-A. Bright).

<https://doi.org/10.1016/j.fsigen.2018.01.003>

Received 20 August 2017; Received in revised form 29 November 2017; Accepted 6 January 2018

Available online 08 January 2018

1872-4973/ © 2018 Published by Elsevier B.V.

ARTICLE INFO

Keywords:

PCAST
STRmix
Forensic DNA
Probabilistic genotyping
Continuous models
Validation

ABSTRACT

We report a large compilation of the internal validations of the probabilistic genotyping software STRmix™. Thirty one laboratories contributed data resulting in 2825 mixtures comprising three to six donors and a wide range of multiplex, equipment, mixture proportions and templates. Previously reported trends in the LR were confirmed including less discriminatory LRs occurring both for donors and non-donors at low template (for the donor in question) and at high contributor number. We were unable to isolate an effect of allelic sharing. Any apparent effect appears to be largely confounded with increased contributor number.

1. Introduction

In 2016, the President's Council of Advisors on Science and Technology (PCAST) issued a report [1] and subsequently an addendum [2]. This report discussed a number of forensic disciplines. Included amongst these was the interpretation of complex DNA mixtures. PCAST defined a complex mixture as any profile with three or more donors. The report noted perceived limits to the proof of validity of the use of probabilistic genotyping (PG) in some situations as of September 2016. In particular they highlighted gaps regarding high ratio and high contributor number mixtures. PCAST considered validity proven for mixtures containing "three contributors where the person of interest comprises at least 20% of the sample." [2]. They noted that the "few studies that have explored 4 or 5 person mixtures often involve mixtures that are derived from only a few sets of people (in some cases, only one)." [2]. They call for the expansion of empirical studies, testing the validity and reliability of PG methods across a broader relevant range of profile types.

PCAST limited themselves for proof of validity to empirical studies published in the peer reviewed literature. There are a number of published reports describing the validation of various probabilistic genotyping software by the developers. These include the New York City Office of Chief Medical Examiner's FST Tool [3], TrueAllele® [4], and STRmix™ [5]. More recently the validation of GenoProof Mixture 3 [6] and Kongoh [7] has been reported.

PCAST also perceived there was a gap in "the need for clarity about the scientific standards for the validity and reliability of forensic methods." [1]. The Scientific Working Group on DNA Analysis Methods (SWGAM) [8] and International Society for Forensic Genetics (ISFG) [9] have both published comprehensive guidelines that inform how to test a probabilistic genotyping system to ensure reliability and validity of results.

At the time of the PCAST report there was a considerable number of empirical studies already undertaken by various laboratories who had implemented, or were in the process of implementing, STRmix™. These followed the SWGDAM guidelines [10,11]. They were not published in the peer reviewed literature largely because it is the policy of many journals not to publish such material. Some of these studies are already in the public domain on websites (see for example [12,13]).

Since the appearance of the PCAST report, the Federal Bureau of Investigation Laboratory, Quantico, has published its STRmix™ internal validation in the peer reviewed literature [14], also in accordance with the SWGDAM guidelines. This publication reports 277 mixtures with two to five donors and a range of mixture ratios and templates.

In this work we report a further study of 2825 mixtures compiled from 31 laboratories (including multi laboratory systems) who are using STRmix™ in casework (28/31) or currently validating STRmix™ for future use in casework (3/31). Mixtures of three, four, five, and six contributors were specifically targeted in order to address the criticisms of PCAST.

We aim to specifically address the deficiencies described by PCAST in their report by addressing the following points:

(1) How well does the method perform as a function of the number of contributors to the mixture? How well does it perform when the number of contributors to the mixture is *unknown*?

(2) How does the method perform as a function of the number of alleles shared among individuals in the mixture? Relatedly, how does it

perform when the mixtures include related individuals?

(3) How well does the method perform and how does accuracy degrade as a function of the absolute and relative amounts of DNA from the various contributors?

We address point 1 in experiment 1 by analysing all submitted mixtures assuming the *apparent* number of contributors. The apparent number of contributors (N) was determined blind by the submitting laboratory following their own standard operating procedures. Note that this resulted in all six person mixtures being analysed as assuming less than six. Additionally, we have assumed $N + 1$ for a subset of the data within experiment 2. Point 2 we address by interrogating the data in experiment 1 with respect to the amount of allelic sharing. Point 3 we address by conducting H_p and H_d true tests on mixtures in experiment 1.

In this work the developers of STRmix™ did not generate or choose the data that was analysed by individual (non developing) laboratories and they have not censored any data from the results. This adheres to the call by PCAST for work to be carried out in conjunction between developers and non developing organisations.

There is a fourth point to the list in the PCAST report:

(4) Under what circumstances and why does the method produce results (random inclusion probabilities) that differ substantially from those produced by other methods?

We do not address point (4) within this paper, however work is ongoing to address it across a number of continuous and semi continuous platforms.

2. Methods

2.1. Data submission

Participating laboratories submitted ground truth known profiles originating from three to six contributors that had previously been interpreted as part of their STRmix™ internal validation studies. Profiles were submitted as analysed data in the form of text or Excel files. In addition, laboratories provided reference profiles for the known contributors, their validated laboratory specific settings, and the apparent number of contributors to each profile. The apparent number of contributors was determined by the submitting laboratories following their own standard operating procedures. The apparent number of contributors was used as the true number of contributors to a crime profile is never known.

2.1.1. Data description

Apparent three, four and five person mixtures were interpreted by staff at ESR (New Zealand) using STRmix™ V2.5.02. No apparent single source or two person mixtures were interpreted as PCAST, perhaps erroneously, decreed foundational validity to be already established for these [1]. In total there were 2825 mixtures interpreted from 31 different laboratories generated using eight different STR multiplexes and analysed on two different types of capillary electrophoresis (CE) instruments.

The STRmix™ settings used for the interpretation were those determined by the contributing laboratory. These included per allele stutter ratios (back and forward, where determined), allele and stutter peak height variance distributions, analytical thresholds, saturation,

and drop in parameters. For each interpretation, eight MCMC chains of 100,000 burn in accepts and 50,000 post burn in accepts were used.

The number of profiles submitted, multiplex, PCR cycle number, CE instrument used, and number of mixtures interpreted for each participating laboratory are provided in Table 1. Note some laboratories submitted profiles generated using more than one multiplex (kit) and some were multi laboratory systems, submitting profiles from different laboratories within the one system. Many of the laboratories undertook dilution series to prepare mixtures for interpretation. These were typically made by taking DNA from a few donors, often staff members, and mixing them in different combinations and ratios. PCAST noted that “In human molecular genetics, an experimental validation of an important diagnostic would typically involve hundreds of distinct samples.” (PCAST pg 81). Each different combination of genotypes is a unique contributor combination.

The number of the unique contributor combinations for each mixture type is given in Table 1. For example, there were twelve combinations of different contributors for the apparent three person mixtures submitted by Lab 01. In total there were 25 apparent three person mixtures from Lab 01, hence 12/25 in Table 1. For all laboratories, there were 205 unique three contributor profiles, 132 unique four contributor profiles, and 14 unique five contributor profiles. Within the STRmix™ deconvolution, template is modelled per contributor [11]. The mode of the post burn in proposals for template per contributor

was used to calculate mixture proportion. The mixture proportions as determined by STRmix™ (sorted by ascending proportion for contributor 1, constrained as the ‘major’ contributor) are plotted for each apparent N in Fig. 1. At least one contributor in 69.5% of the apparent three person mixtures, 96.5% of the apparent four person mixtures and all of the apparent five person mixtures contained less than 20% of the sample.

PCAST calls for an investigation to be conducted into how a method “performs as a function of the number of alleles shared among individuals in the mixture”. In Fig. 2 we provide the distribution of allele sharing for known contributors in the mixtures, broken down by the true number of contributors to a mixture. Allele sharing (AS) is defined as the fraction of alleles in the donors collectively that appear in two or more donor genotypes. The upper tail (> 0.80 proportion AS) for the three and four contributor mixtures are a known family group consisting of a mother, father, and their two biological children that was investigated by one participating laboratory.

2.2. Experiment 1

For each profile, likelihood ratios (LRs) were calculated for the true donors and 10,000 false donors. The profiles of the 10,000 non donors were created by simulation using the FBI Caucasian allele frequencies for each multiplex. All LRs were calculated using the Caucasian allele

Table 1

A list of the contributing laboratories, multiplex (kit) used, PCR cycle number, and CE instrument. The total number of mixtures interpreted per laboratory are sorted by apparent number of contributors with the number of unique contributor combinations and minimum minor proportion as determined by STRmix™ indicated.

Lab	Samples submitted (true N)	Kit	Cycle Number	CE	Number of each mixture type Unique contributor combinations/total (Minimum minor contribution)		
					Apparent 3p	Apparent 4p	Apparent 5p
L01	N ₃ = 24, N ₄ = 23	Fusion 5C	28	3130	12/25(7%)	12/22(7%)	–
L02	N ₃ = 19, N ₄ = 24	Identifiler™ Plus	28	3500	4/21(6%)	3/22(6%)	–
L03	N ₃ = 88, N ₄ = 128, N ₅ = 48	GlobalFiler™	29	3500	5/87(3%)	6/161(< 1%)	2/16(5%)
L04	N ₃ = 3, N ₄ = 3	NGM SElect™	30	3130	1/3(10%)	1/3(6%)	–
L05	N ₃ = 39, N ₄ = 37	Fusion 6C	29	3130	5/50(3%)	4/26(< 1%)	–
L06	N ₃ = 28, N ₄ = 69	Identifiler™ Plus	28	3130	4/67(28%)	2/30(12%)	–
L07	N ₃ = 29, N ₄ = 30	Identifiler™ Plus	28	3130	4/36(2%)	1/23(2%)	–
L08	N ₃ = 19, N ₄ = 20	Fusion 6C	29	3500	2/24(7%)	1/15(4%)	–
L09	N ₃ = 28, N ₄ = 8, N ₅ = 6	Fusion 5C	30	3500	4/28 (1%)	2/8(2%)	1/6(6%)
	N ₃ = 22, N ₄ = 22	Identifiler™ Plus	29	3500	1/22 (1%)	1/22 (2%)	–
L10	N ₃ = 29, N ₄ = 52, N ₅ = 12	GlobalFiler™	28	3500	4/64 (3%)	4/29 (1%)	–
L11	N ₃ = 69, N ₄ = 42	GlobalFiler™	28	3500	2/69 (< 1%)	2/42 (1%)	–
L12	N ₃ = 28, N ₄ = 32	NGM SElect™	29	3500	2/38 (5%)	1/22 (5%)	–
L13	N ₃ = 3, N ₄ = 3	NGM SElect™	30	3130	1/3 (9%)	1/3 (3%)	–
	N ₃ = 3, N ₄ = 3	PowerPlex® ES117 Pro	30	3130	1/3 (13%)	1/3 (6%)	–
L14	N ₃ = 10, N ₄ = 13	PowerPlex® 16 HS	30	3130	2/16 (7%)	1/7 (5%)	–
L15	N ₃ = 26	PowerPlex® ES117 Fast	30	3130	11/26 (2%)	–	–
	N ₃ = 28	PowerPlex® ES117 Fast	30	3500	11/28 (2%)	–	–
L16	N ₃ = 29, N ₄ = 11	Identifiler™ Plus	28	3130	9/38 (4%)	1/2 (5%)	–
L17	N ₃ = 26, N ₄ = 32	GlobalFiler™	29	3500	2/32 (4%)	1/26 (1%)	–
L18	N ₃ = 97, N ₄ = 46	Fusion 5C	29	3130	7/108 (7%)	3/35 (2%)	–
L19	N ₃ = 28, N ₄ = 30	Identifiler™ Plus	29	3130	9/37 (3%)	15/21 (2%)	–
L20	N ₃ = 22, N ₄ = 23, N ₅ = 12	GlobalFiler™	29	3500	9/42 (< 1%)	4/13 (5%)	1/2 (1%)
L21	N ₃ = 43, N ₄ = 39	Fusion 6C	29	3500	14/59 (4%)	9/23 (1%)	–
L22	N ₃ = 62, N ₄ = 65, N ₅ = 11	GlobalFiler™	29	3500	27/69 (3%)	25/64 (1%)	2/5 (7%)
L23	N ₃ = 72, N ₄ = 64	Fusion 6C	29	3500	6/83 (1%)	4/53 (< 1%)	–
	N ₃ = 159, N ₄ = 60	Identifiler™ Plus	28	3130	4/161 (1%)	3/58 (< 1%)	–
L24	N ₃ = 35, N ₄ = 36	GlobalFiler™	29	3500	4/37 (3%)	3/34 (2%)	–
L25	N ₃ = 20, N ₄ = 24	GlobalFiler™	29	3500	1/20 (5%)	1/24 (6%)	–
L26	N ₃ = 18, N ₄ = 12	Identifiler™ Plus	28	3130	17/25 (6%)	3/5 (< 1%)	–
L27	N ₃ = 51, N ₄ = 42	Identifiler™ Plus	28	3500	5/71 (3%)	2/22 (< 1%)	–
L28	N ₃ = 12, N ₄ = 77, N ₅ = 76, N ₆ = 65	Fusion 5C	29	3500	6/24 (3%)	7/151 (< 1%)	6/55 (< 1%)
L29	N ₃ = 52, N ₄ = 52	GlobalFiler™	28	3500	2/53 (3%)	1/51 (1%)	–
L30	N ₃ = 31, N ₄ = 42	GlobalFiler™	29	3500	4/42 (4%)	3/31 (< 1%)	–
L31	N ₃ = 63, N ₄ = 99, N ₅ = 17	GlobalFiler™	29	3500	3/80 (1%)	4/85 (< 1%)	2/14 (< 1%)
TOTAL Number of each mixture type unique combinations/total (minimum minor contribution)					205/1591 (< 1%)	132/1136 (< 1%)	14/98 (< 1%)

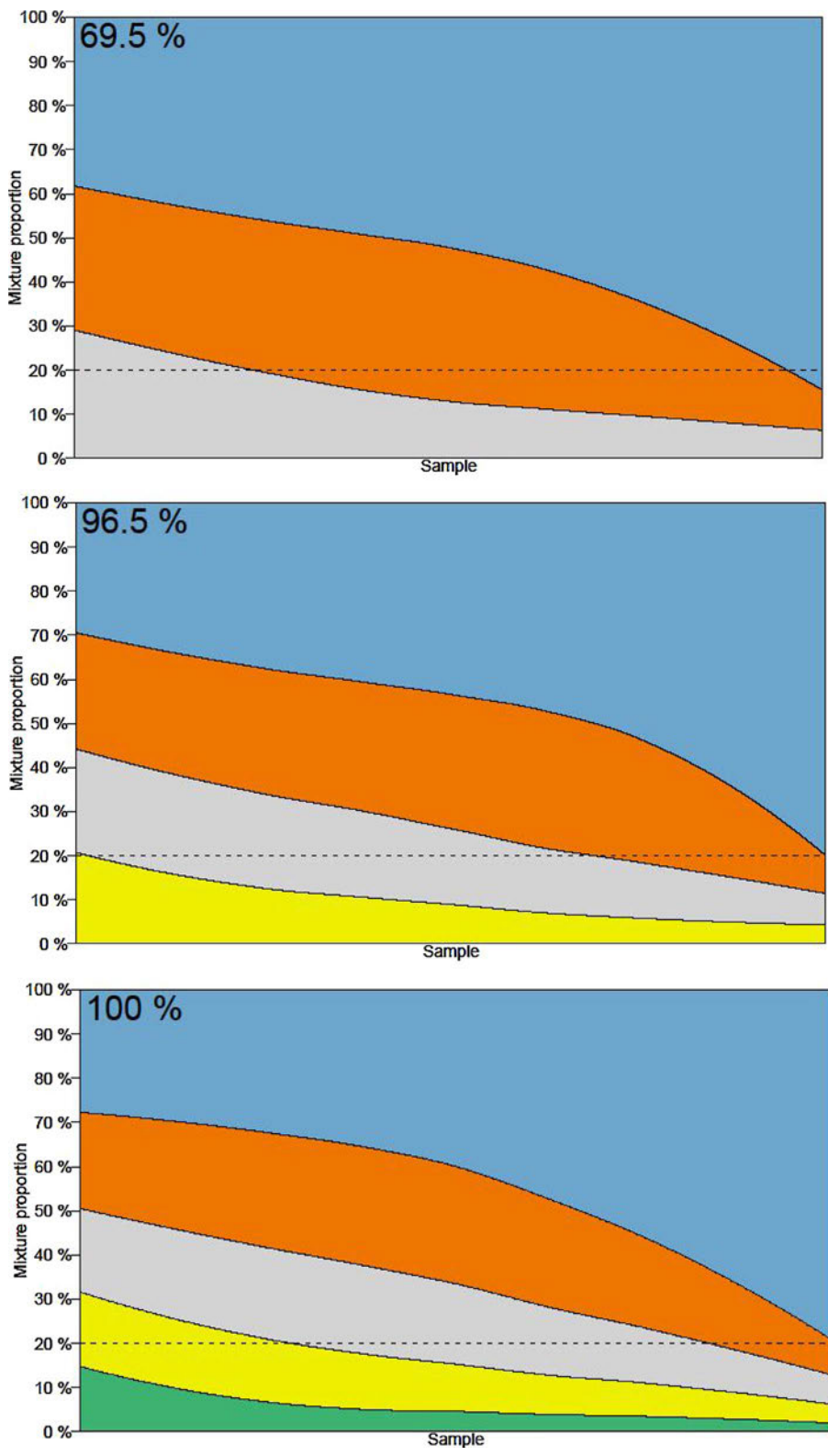


Fig. 1. Mixture proportions as calculated by STRmix™ and sorted by ascending proportion plotted by apparent N where 1a is apparent three, 1b apparent four and 1c apparent five N. Plots are smoothed for improved readability.

frequencies from the FBI expanded CODIS core set [15] and a theta (F_{ST}) of 0.01. The propositions considered were:

H_p : the DNA originated from the person of interest (either true or false donor) and N-1 unknown contributors

H_d : the DNA originated from N unknown contributors

where N was the apparent number of contributors.

Average peak height (APH) was calculated for each contributor by averaging the peak heights of the unmasked alleles (not shared between contributors and not in back stutter positions of any other contributor alleles). Alleles that had dropped out were assigned a height of half the laboratory’s analytical threshold (AT).

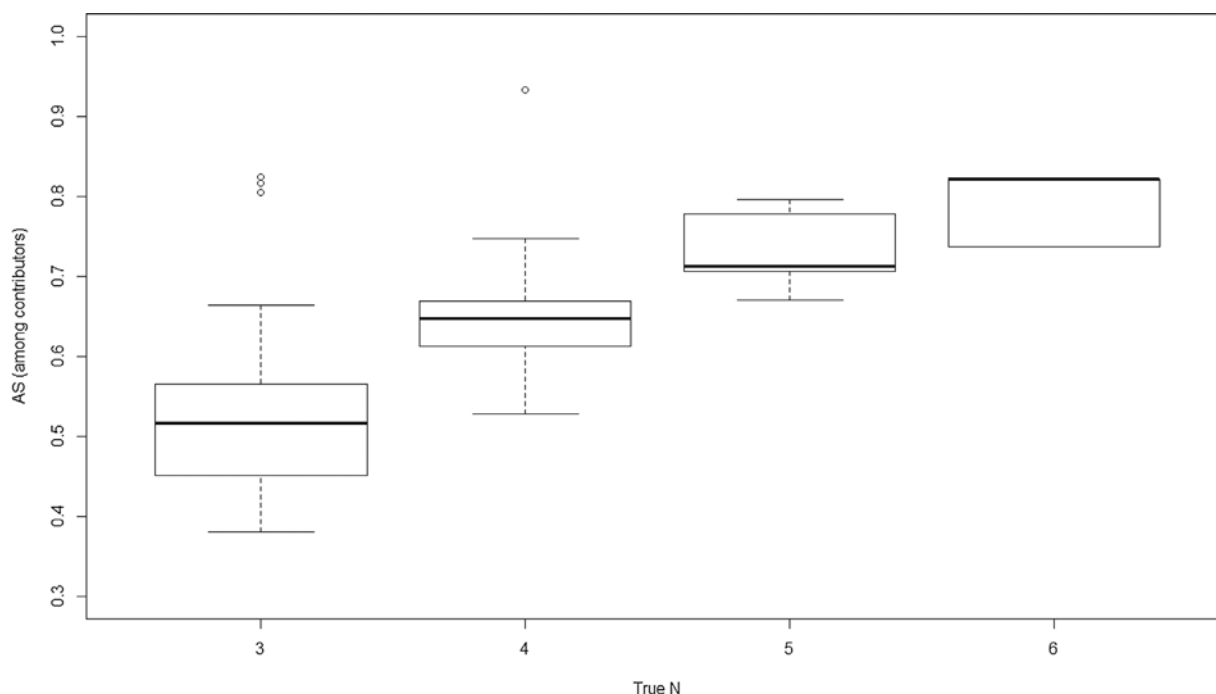


Fig. 2. Distribution of allele sharing (AS) for known contributors to mixtures, plotted by true N.

2.3. Experiment 2

For one laboratory the three and four contributor profiles were analysed at both the apparent number of contributors (N) and one greater (N + 1). For these mixtures, apparent N was the same as known N. In practise, when analysed as N + 1 a non existent contributor with true mixture proportion 0 has been added to reflect this ambiguous contributor being present at trace amounts. The mixture proportion for this additional contributor was constrained to be low, but not necessarily zero, using the informed mixture proportion prior function in STRmix™ [16]. The LRs for the true donors and 10,000 non donors were analysed as per Experiment 1.

3. Results

3.1. Data review

The summary statistics for each interpretation were reviewed prior to review of the LR. These statistics included the Gelman Rubin convergence statistic, average log₁₀(likelihood) of the post burn in MCMC, the average of the post burn in allele variance parameter, and the average of the post burn in stutter variance parameter. These values can be used as diagnostics of the interpretation, to check for adequate MCMC convergence. They are designed to help assess a STRmix™ deconvolution result. No profiles required reinterpretation based on the review of the diagnostics.

The LRs were also reviewed as part of data quality checks. Large inclusionary LRs (LR > 1) for false contributors and exclusionary LRs (LR < 1) for true contributors where the APH was relatively high were investigated. For any given mixture, there is a chance that a given false contributor will have sufficient matching alleles, by chance, to give an LR > 1. Likelihood ratios for false contributors above 10,000 are provided in Table 2. Following Taylor et al. [17];

- 1) The average LR for false contributors should be about 1.
- 2) The probability of observing a likelihood ratio of x or larger from an unrelated non donor is no more than 1 in x.

These two statements form the basis for assessing false contributor tests. In an experiment on 10,000 false contributors we would expect approximately one LR ≥ 10,000, plausibly 10 above 1000 and 100 above 100. This work reports the comparison of approximately 20 million false contributors. The average LR for all false contributors is approximately 0.12. The reason that this average is below one is because the genotypes that would lead to the highest LRs (and so contribute significantly to the average) were not happened across in the number of H_d true tests performed.

The fraction of allele sharing for the twenty highest false contributors ranged from 0.61 to up to 0.98 of the alleles with the mixture (Table 2).

False exclusions were observed for known contributors where the apparent number of contributors was fewer than the ground truth

Table 2
Summary of large inclusionary LRs for false contributors and percentage of overlapping alleles.

Number	Kit	Apparent N	Known N	LR	Fraction of allele sharing
1	GlobalFiler™	3	3	505,924	0.81
2	Identifiler Plus™	3	3	379,716	0.90
3	GlobalFiler™	4	4	197,907	0.98
4	GlobalFiler™	3	4	134,486	0.83
5	GlobalFiler™	4	4	88,022	0.98
6	GlobalFiler™	4	5	53,019	0.93
7	Fusion 6C	3	3	47,062	0.85
8	Fusion 5C	3	3	43,065	0.78
9	Fusion 5C	3	3	26,874	0.80
10	GlobalFiler™	3	3	19,340	0.67
11	Fusion 5C	3	3	17,582	0.61
12	Identifiler Plus™	3	4	16,995	0.80
13	Fusion 5C	4	4	15,765	0.80
14	Identifiler Plus™	3	3	14,446	0.87
15	NGM SElect™	3	4	13,717	0.78
16	GlobalFiler™	4	5	12,135	0.93
17	Fusion 5C	4	6	11,188	0.93
18	Fusion 5C	3	3	10,896	0.80
19	Fusion 5C	3	3	10,309	0.82
20	Identifiler Plus™	3	3	10,298	0.80

number of contributors. This was an expected result [18,19]. By way of explanation we present an example of a true five contributor mixture interpreted assuming four contributors. Fig. 3 is a stylised electropherogram for one locus (SE33) with peaks and their corresponding height. STRmix™ has modelled the minor peaks as stutters of the eight alleles all above 800 rfu. Assuming four contributors and eight alleles, each contributor must be heterozygous at this locus. One known contributor who is homozygous at this locus (genotype 18,18) is therefore excluded ($LR_{SE33} = 0$) as a contributor under the assumption of four contributors. A second individual (genotype 12,23.2) is a poor fit to the profile assuming four contributors given the large peak imbalance for these alleles resulting in a low weight and subsequent LR at this locus ($LR_{SE33} = 0.01$).

False exclusions were also observed due to human error if, for example, an incorrect reference profile was supplied. Human errors were all corrected and the LRs reassigned. Another common reason for a false exclusion was due to the lack of separation of alleles during capillary electrophoresis. This occurred when peaks that differed by one base pair (for example a 9.3/10 at TH01) were not separated sufficiently during electrophoresis and one was subsequently not designated at analysis [14]. In all identified occasions an allele corresponding with a minor contributor was ‘hidden’ within the shoulder of an allele from a major contributor. Affected loci were identified by reviewing the electropherogram, and the locus was subsequently ignored during the interpretation.

3.2. Results for experiment 1

Violin plots [20] showing the densities of $\log_{10}(LR)$ per APH range are provided in Fig. 4 through 6 for apparent three, four and five contributor mixtures, respectively. The percentage of non contributors giving $LR = 0$ is given at the bottom of each plot. The plots show the general trends for both H_p and H_d results.

Plots of $\log_{10}(LR)$ versus APH for all mixtures are given in the Supplementary material Figs. S1 through S9, plotted by apparent number of contributors. These plots are also separated into H_p true (LRs for true donors) and H_d true results (LRs for 10,000 false donors) and H_p

and H_d true combined in order to help visualise the trends. In order to facilitate comparison between plots the axis scales have been retained for the same N. For the H_p true results where apparent N differed from the true N these results are indicated with a different plotting symbol. LR results of 0 (exclusions) have been plotted at -40 on the \log_{10} scale. Normalisation of the CE platform (3130 versus 3500) had no effect on the trends present in the data and is not shown.

The vertical line of points in Fig. S8 at 50 rfu where $\log_{10}(LR) > 1$ are two siblings from a family study that included their biological father and mother. Due the complete allele sharing with both parents the APH for both siblings were calculated at half the AT, which is artificially low.

Fig. 4, Fig. 5 and Fig. 6 show the same trends as seen in previous work [14,21], with the addition of information regarding the consequence of over or underestimating the number of contributors. With increased information present within the profile (either by greater amounts of DNA, or by fewer contributors) the power to discriminate contributors from non contributors increases, and there is a divergence of the LR from neutrality. Also consistent with previous findings [18], the underestimation of the number of contributors tends to either have little effect on the LR or will tend to exclude known contributors. This occurs because genotype sets possessing unreal allele pairings are forced to be given weight within the analysis. Interestingly this exclusionary effect was reduced as mixture complexity increased to the point that there were no exclusions produced from underestimating the number of contributors in five person mixtures (Fig. S1). We surmise that this is an effect of the increased allele sharing generally seen in higher order mixtures (Fig. 2) meaning that there are increased opportunities for genotype sets to possess the genotypes of the known contributors, even when their number is underestimated.

A plot of $\log_{10}(LR)$ s for profiles generated using Identifiler™ Plus 28 cycles analysed on a 3130 or 3500 are plotted in Figs. S10 and S11 for the apparent three and four person mixtures, respectively (Supplementary material). As a visual aid we have added smoothed trend lines (LOWESS lines) for instrument type. These trend lines give a rough idea of the relationship between $\log_{10}(LR)$ and APH for different cases. Any trend line is a compromise between smoothness and error. We did not get materially different results when trying other trend lines

Peak	Height
12	892
14	116
15	1104
17	155
18	1899
22.2	186
23.2	2334
24.2	147
25.2	1386
26.2	1508
27.2	1410
30.2	89
31.2	953

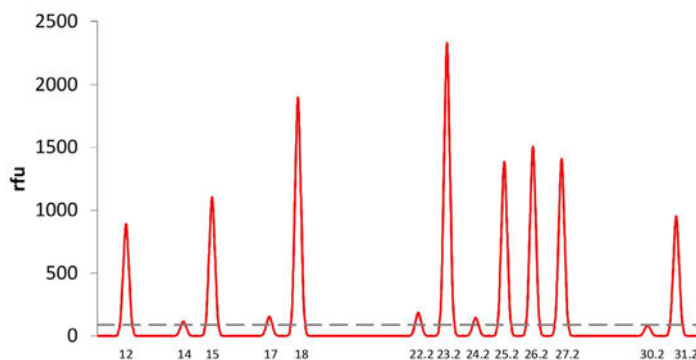


Fig. 3. Stylised locus electropherogram with tabulated peak designations and their corresponding heights for a true five person mixture interpreted assuming four contributors.

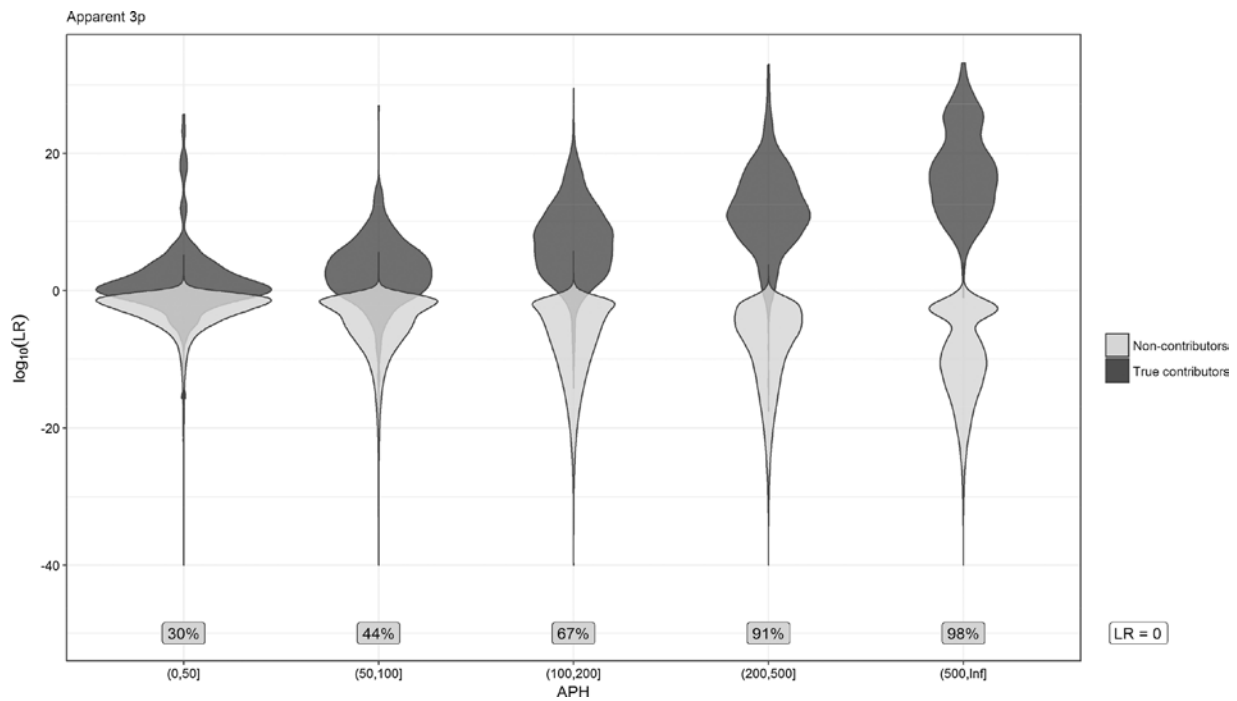


Fig. 4. Violin plot of $\log_{10}(LR)$ versus APH for apparent three contributor mixtures.

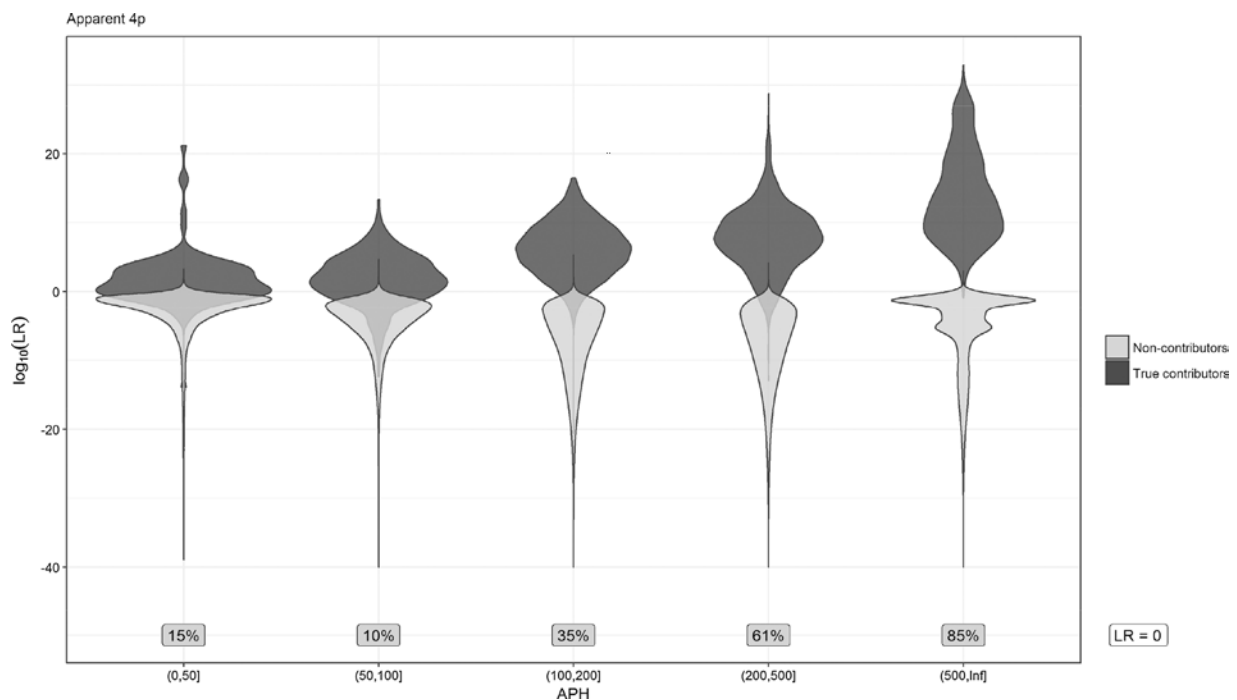


Fig. 5. Violin plot of $\log_{10}(LR)$ versus APH for apparent four contributor mixtures.

available in the ggplot2 package [22].

Applied Biosystems report a three to fourfold increase in rfu scale with the 3500 models over the older Applied Biosystems 3100 and 3130 instruments [23]. This is evidenced by a general shift in the trend lines for the 3500 to the right in Figs. S10 and S11. The lines converge at high APH where the individual contributor profiles are likely fully represented and trend to $\log_{10}(LR) = 0$ as APH decreases.

Plots of $\log_{10}(LR)$ s for true contributors identified by kit type are given in Figs. S12 and S13 for the apparent three and four person mixtures, respectively (Supplementary material). The LOWESS trend lines for kit type are modelled. These plots indicate the performance of

the difference kits over APH for submitted profiles. As the profiles analysed are not the same between the different kits they are not suitable for comparing performance of the different kits. However, they do give an indication of general trends. As an example, comparing the trend lines for Identifiler™ versus GlobalFiler™ mixtures, at higher per contributor APH the $\log_{10}(LR)$ s are higher for GlobalFiler™ profiles, most likely due to the additional loci within the GlobalFiler™ kit compared with the Identifiler™ Plus kit. $\log_{10}(LR)$ values for Identifiler™ profiles are generally higher at low contributor APH compared to GlobalFiler™ profiles, however. This could be due to the increased variability of the GlobalFiler™ profiles, all of which were analysed on

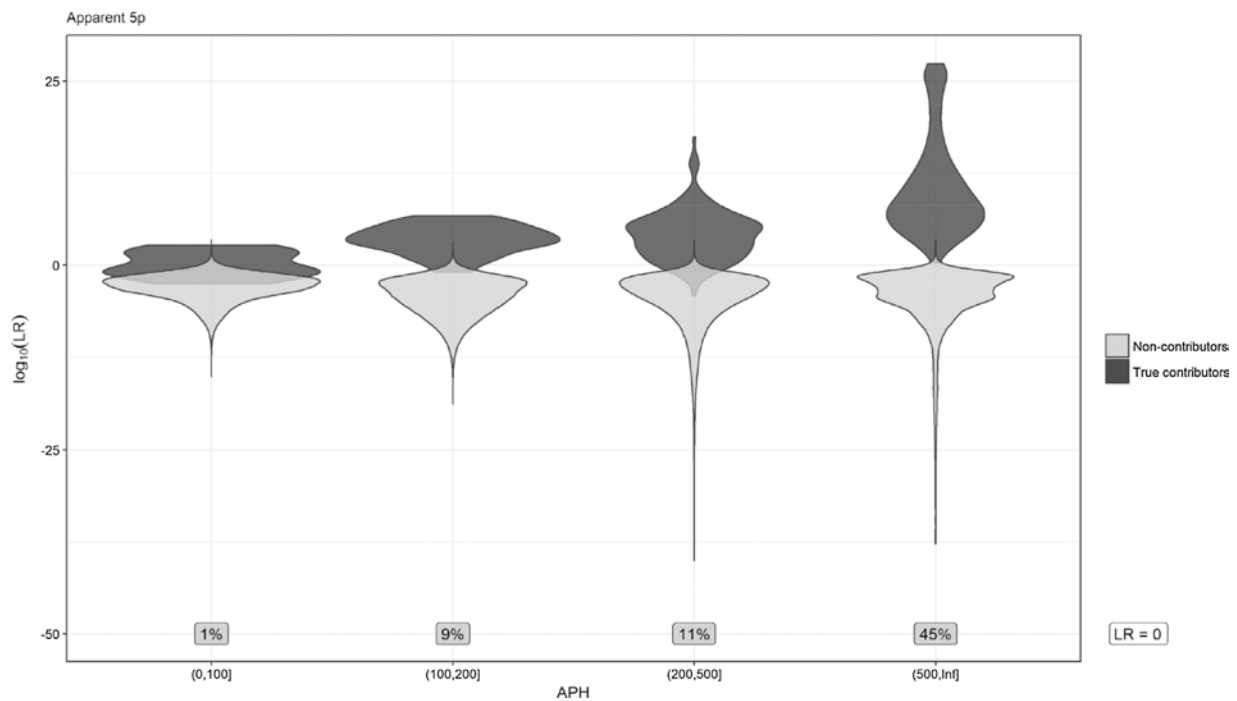


Fig. 6. Violin plot of $\log_{10}(LR)$ versus APH for apparent five contributor mixtures.

3500 instruments, in some cases with cycle numbers greater than 28 [24]. A comparison of the Fusion 5C and Fusion 6C trend lines illustrates the increase in discrimination achieved by adding the highly polymorphic STR locus SE33 resulting in generally higher $\log_{10}(LR)$ s.

3.3. Results for experiment 2

The LRs for H_p true under the assumption of N and N + 1 contributors are presented in Fig. 7. Within Fig. 7 the size of the plotting symbols is relative to the contributor's proportion of the mixture. The LRs for H_d true are summarised in Figs. 8 and 9.

The results shown in Fig. 7 demonstrate some findings that are important for DNA mixture interpretation:

1. The general result was a decrease in the LR for true contributors after the assumption of an additional contributor to the mixture. The

additional proposed contributor is interacting with the true contributors, diffusing the genotype weights, hence lowering the LR.

2. When a proposed person of interest aligns with the dominant component in a mixed DNA profile, the support for their inclusion to a mixture will not be markedly altered by an increase in the number of contributors under which the DNA profile is analysed. This is consistent with earlier findings [18].
3. Even when only donating a minor component of the total DNA, the change in LR produced by increasing the number of contributors is still not extreme. In no instances has an increase in the number of contributors seen an LR that strongly favours inclusion shift to one that favours exclusion.

We also consider the effect of contributor overestimation on H_d true tests. Fig. 8 shows the distribution of H_d true $\log_{10}(LR)$ values for three person mixtures when considered as originating from three (N) or four

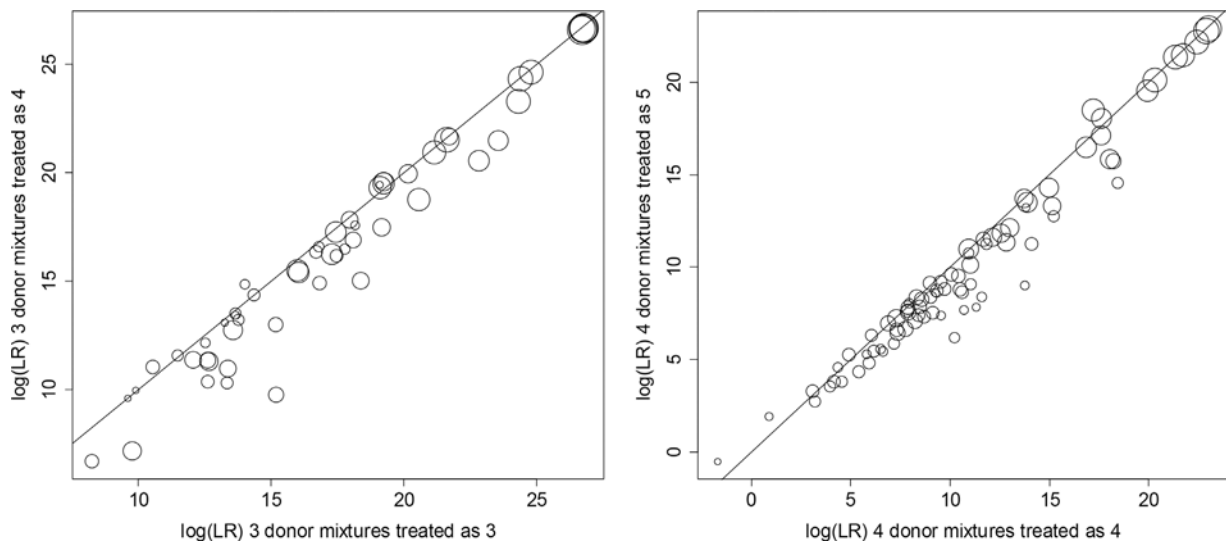


Fig. 7. The LRs for H_p true for three and four person mixtures from one laboratory under the assumption of N and N + 1 contributors. The $x = y$ line is shown. The size of the plotting symbol represents the mixture proportion of the donor.

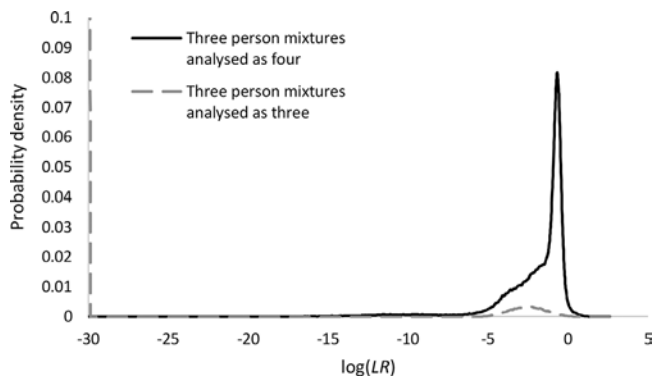


Fig. 8. The LRs for H_d true for three person mixtures from one laboratory under the assumption of N and $N + 1$. The bulk of the distribution for the three person mixtures analysed as three is at $LR = 0$ (90% of all LRs) represented by $\log_{10}(LR) = -30$.

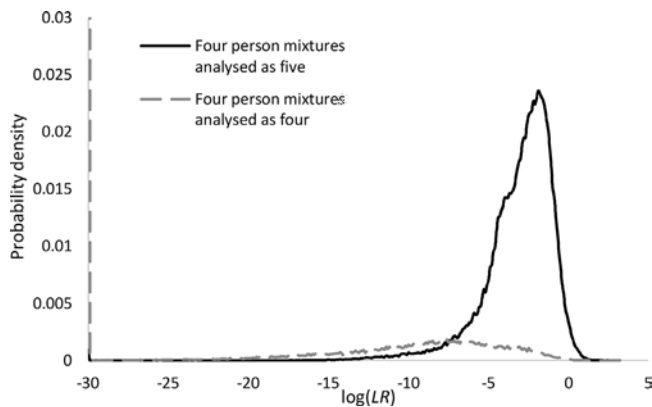


Fig. 9. The LRs for H_d true for four person mixtures from one laboratory under the assumption of N and $N + 1$. 81% of four person mixtures analysed as four resulted in $LR = 0$, represented by $\log_{10}(LR) = -30$.

($N + 1$) contributors. Fig. 9 shows the results of the same analysis but when considering four person mixtures as originating from either four (N) or five ($N + 1$) individuals. The bulk of the distribution for the three person mixtures analysed as three is at $LR = 0$ (90% of all LRs) represented by $\log_{10}(LR) = -30$ in Fig. 8. In Fig. 9, 81% of four person mixtures analysed as four resulted in $LR = 0$, again represented by $\log_{10}(LR) = -30$.

Figs. 8 and 9 show that, when analysed using the true number of contributors, the instances of H_d true comparisons that lead to outright exclusions is greatly increased. Put another way, inflating the number of contributors leads to an increase in non zero LRs. In fact, the most common occurrence from inflating the number of contributors is that during deconvolution the additional proposed contributor is assigned a very low template (near 0) and can possess any genotype (including complete dropout) with relatively even weight. This is visually seen in Figs. 8 and 9 by the peak of $\log_{10}(LR)$ s just below 0.

3.4. Allele sharing

A demonstration of the effect that allele sharing has on the LR is confounded by other factors that affect the magnitude of the LR, such as:

- The amount of DNA that the individual has donated to the sample,
- The mixture proportions of the contributors (mixtures at an even mixture proportion will tend to have lower LRs, due to the reduction in information that peak heights provide to determine genotype sets),
- Masking of minor contributors in stutter positions of major contributors.

An individual that shares 100% of alleles with the other contributors to a mixture can still have their genotype resolved completely, based on peak heights, given the right circumstances (as seen in Fig. S8 for the family set). The ability to use peak heights in this way is one of

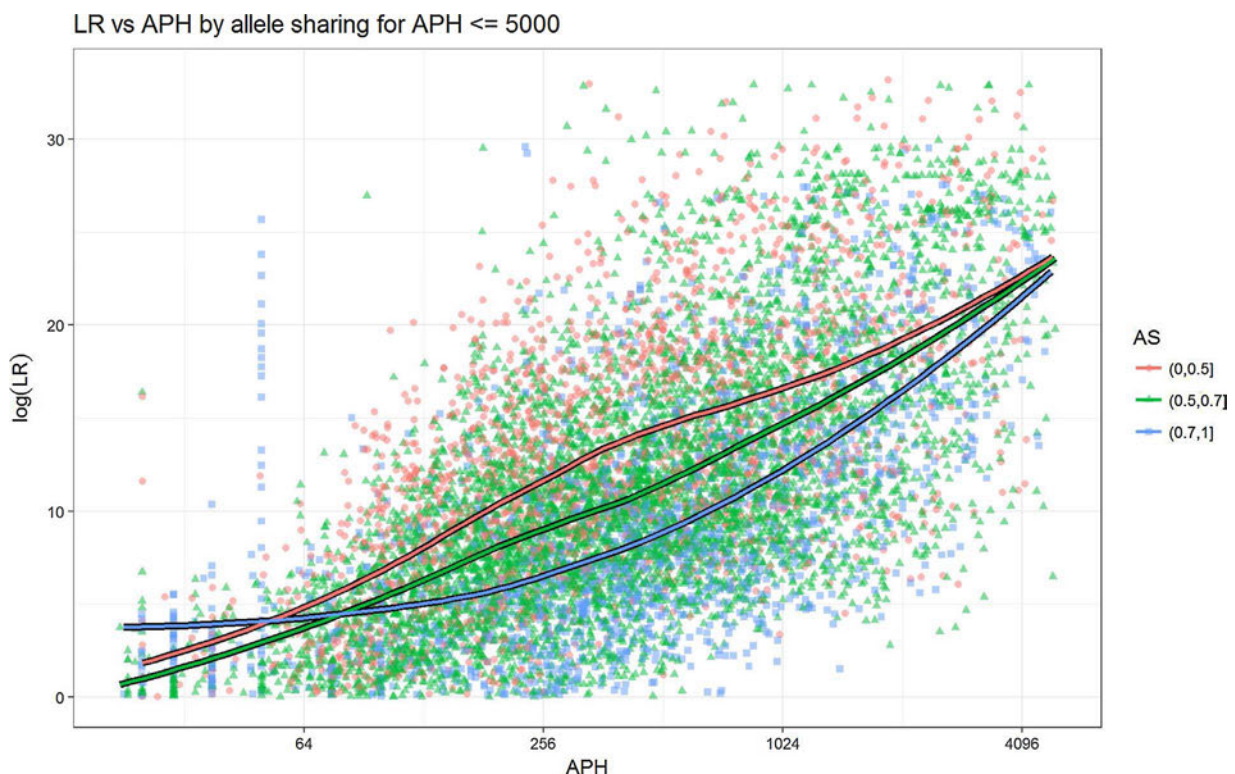


Fig. 10. The size of the $\log_{10}(LR)$ by considering differing amounts of input DNA (APH) and amount of allelic sharing (AS). The set of data points with high AS (0.7,1] are a family set (father, mother, children) where all alleles from the children are masked by the parents and therefore APH was set to half of the AT.

the main drivers for the differences in *LR*s produced between fully and semi continuous systems. In Fig. 10 we show the *LR* (on \log_{10} scale) for all data in the study, broken up into three categories of allele sharing, 0 to 0.5, 0.5–0.7 and 0.70–1.0. The lines in Fig. 10 are LOWESS lines to demonstrate the general trends of the data.

From Fig. 10, it appears that the greater the allele sharing, the less the power there is to discriminate a true contributor from a non contributor. This trend is intuitive as it would be expected that the more an individual's alleles are already accounted for by others in the mixture, the less 'need' there is for someone possessing those alleles to reasonably explain the observed peaks in the mixture. However, further experimentation shows that this apparent trend is totally confounded by the number of contributors to the mixture. Fig. 11 shows the same style of result as Fig. 10, but plotted by number of contributors. In Fig. 11 the recovered weight of evidence is plotted, that is, $\log_{10}(LR)/\log_{10}(1/RMP)$. RMP is the conditional match probability following the Balding and Nichols model [25] and a theta (F_{ST}) of 0.01. Carrying out this transformation accounts for the different profiling systems that are being combined in this meta analysis. In these plots the y axis is bounded by one demonstrating that the *LR* cannot exceed one divided by the random match probability.

The trend seen in Fig. 2 is that higher order mixtures tend to have true contributors that share more alleles (because there are more of them to potentially share), and Figs. S1–S9 demonstrate that higher order mixtures tend to have less discrimination power. Therefore, there is a correlation between allele sharing and *LR* evident in Fig. 10, particularly at low APH. In Fig. 11 this trend disappears, showing that it is an effect of number of contributors, and not allele sharing, that is the main driver to *LR* change.

In Fig. 12 we plot a density plot of $\log_{10}(LR)/\log_{10}(1/RMP)$ by the amount of allele sharing of the non contributors with the true contributors. The $\log_{10}(LR)/\log_{10}(1/RMP)$ cannot exceed one, which would indicate a fully resolved component. Inspection of Fig. 12 shows that as the fraction of shared alleles increases the $\log_{10}(LR)/\log_{10}(1/RMP)$ for the non contributor increases. As allele sharing of the non contributors

with the true contributors decreases, the $\log_{10}(LR)/\log_{10}(1/RMP)$ decreases with more observations around zero, indicated by the broadening of shape. Fig. 12 shows that non contributors are unlikely to yield large *LR*s even if they share many alleles with the true contributors. In other words, non contributors that share most of their alleles with the mixture's donors can typically still be excluded because the peak heights make their inclusion unlikely.

On the other hand, Fig. 6 shows that true contributors can yield *LR*s close to the inverse of the single source match probability even in five person mixtures. This means that at least this mixture donor's component is almost fully resolved on the basis of peak heights. This may be expected, for instance, in a 10:1:1:1:1 mixture where the major may be clearly resolved by simply 'eyeballing' the electropherogram.

4. Discussion

4.1. Performance of the system with regards to contributor number

In principle, we observe less discriminatory *LR*s for true and non contributors when the number of assigned contributors increases. This has been demonstrated previously using STRmix™ [14,21]. This does not mean that mixed DNA profiles containing more contributors are less reliable, just that they are less informative with respect to potential contributors.

The true number of contributors to a crime profile is never known. Within this work we have used the apparent number of contributors when interpreting the mixtures. Apparent N was determined by each submitting laboratory using their own validated methods. The assigned N can be fewer than the true N when individuals within a profile have "dropped out" (their alleles falling below the detection limit of the CE) and within mixtures of contributors with high amounts of allele sharing (an extreme example being mixtures of related individuals). Apparent N may be assigned a number higher than true N in the presence of artefacts, such as stutter, that are larger than expected. This assignment can be confounded in saturated profiles.

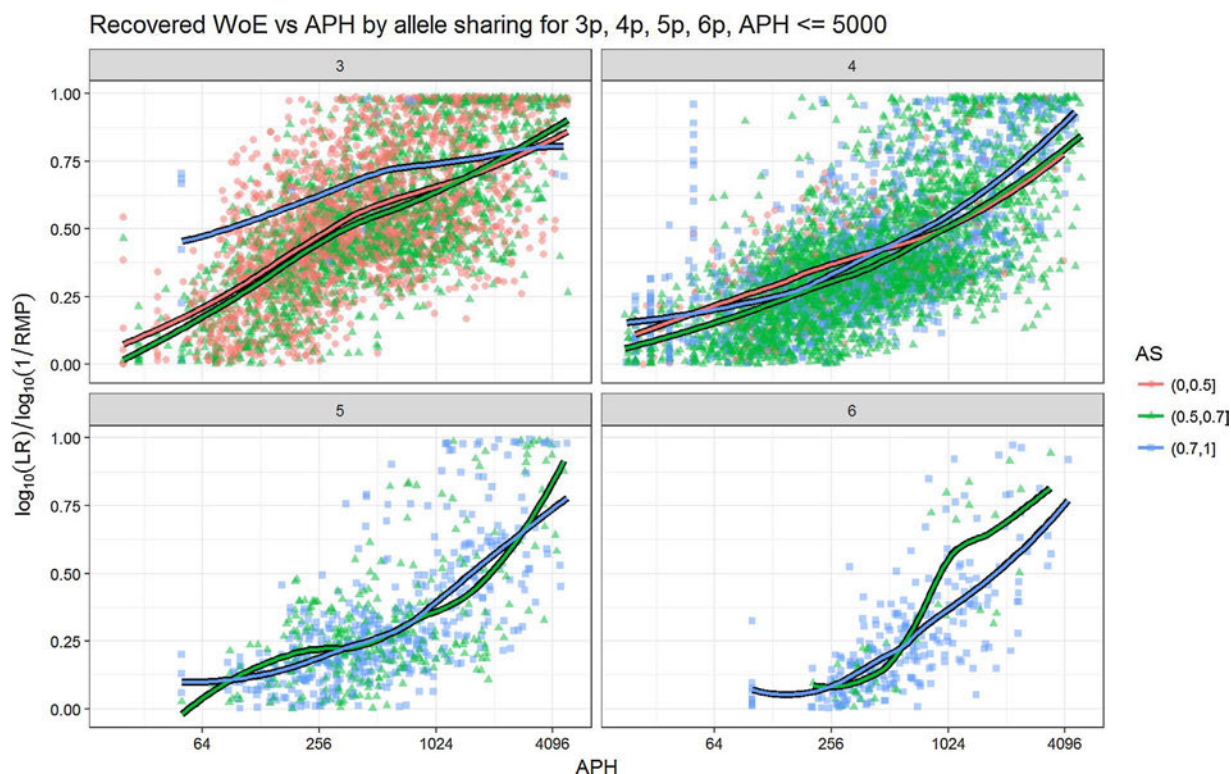


Fig. 11. The size of the recovered weight of evidence $\log_{10}(LR)/\log_{10}(1/RMP)$ by considering differing amounts of input DNA (*APH*) and amount of allelic sharing (*AS*) plotted by true number of contributors.

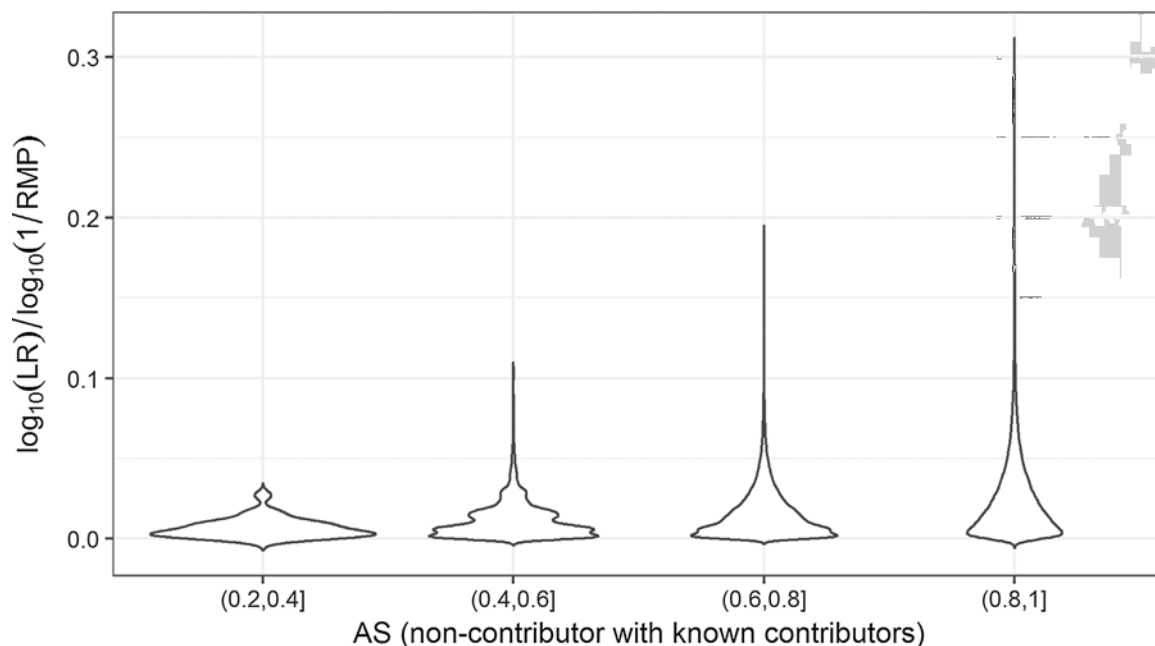


Fig. 12. Density plot of $\log_{10}(LR)/\log_{10}(1/RMP)$ by the amount of allele sharing of the non-contributors with the true contributors.

As the number of contributors to a DNA profile increases, the DNA mixture becomes more complex. Figs. S1 through S9 show LR s generated for H_p and H_d true for apparent three, four and five person mixtures plotted against APH . As the number of contributors to the mixture increases the LR s trend towards one. This holds true for both H_p and H_d true although the effect for H_d true data is less clear given the number of data. As the number of contributors to a mixture increases, so too do the potential genotype combinations that can explain the observed data. This results in an overall reduction in the weights assigned to each genotype set, as these weights are spread across more potential genotype sets. This behaviour was previously described by Taylor [21].

When overestimating the number of contributors to a mixture ($N + 1$) the LR generally decreased for true contributors. This can be explained by STRmix™ spreading the weights for the true donors across more genotype sets. For four person mixtures the magnitude of the effect on the LR for known contributors was somewhat dependent on

the proportion that the donor contributed to the mixture. The effect was greater for minor contributors to the mixture and less for major contributors (represented by more data points on the $x = y$ line within Fig. 7). Overestimating the number of contributors had little or no effect on the LR of the major contributor to the mixture, demonstrated by the largest circles sitting on the $x = y$ trend line. In these cases the additional proposed contributor was modelled as a trace contributor, sharing alleles with the true minor contributors to those mixtures and having little effect on the major. For the three person mixtures the effect was more visible across a range of mixture proportions. This was likely due to similarities in mixture proportions of the different contributors, with no obvious major contributors.

The effect of overestimation of the number of contributors was also determined for non contributors using H_d true tests. When assuming $N + 1$ the number of occurrences of non contributors resulting in non exclusionary LR s increased. During deconvolution the additional

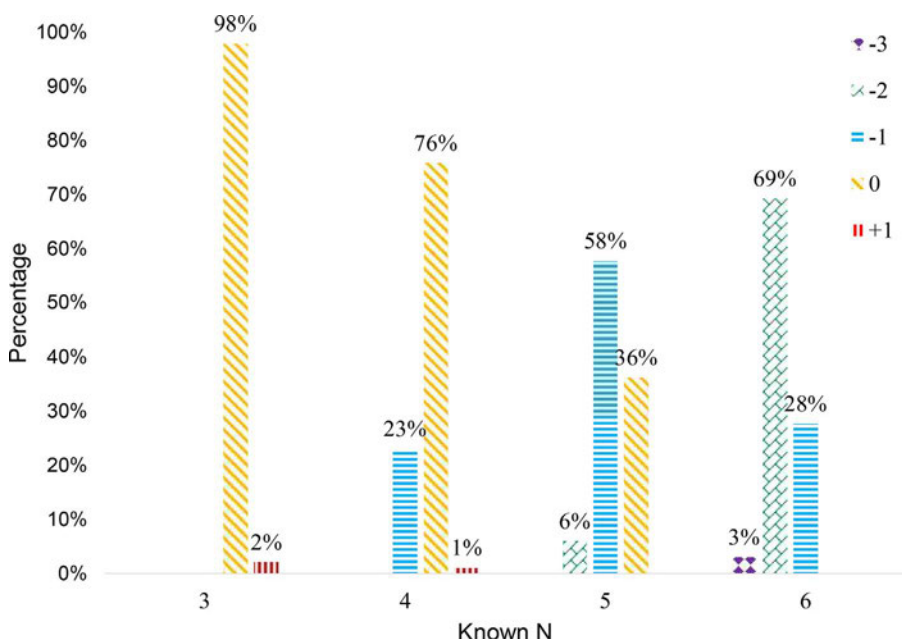


Fig. 13. Plot of percentage of mixtures showing various differences between apparent N and known N against known N . As an example, -1 indicates apparent N was one fewer than known N .

proposed contributor is assigned very low template and can possess any genotype leading to these results.

In summary, overestimation of the number of contributors generally leads to lower *LR*s for true contributors (Fig. 7) and an increase in *LR*s for non contributors (Fig. 8).

Underestimating the number of contributors can result in false exclusions of true donors. In this study, this is seen when apparent *N* is fewer than true *N*. This is demonstrated in the H_p true plots within the Supplementary material where apparent *N* that differs from known *N* are indicated with a different plotting symbol.

When assigning *N*, for false donors the only risk is overestimation, as there is a small increase in the number of very low grade false inclusions. With respect to the *LR* for true donors, you are either correct or conservative when *N* is either under or overestimated.

In Fig. 13 we provide a plot showing the level of over and under estimation of the apparent *N* compared to the known *N* in this study.

Fig. 13 shows that an underestimation of *N* was more common than an overestimation of *N*. There are three broad reasons why *N* might be underestimated:

- 1) One contributor has donated so little DNA that their presence is unseen in the DNA profile, we call this the tiny minor scenario;
- 2) Contributors are present so that one or more is completely masked by others in the profile, and in a way so that peak height does not reveal their presence. This is the hidden contributor scenario;
- 3) There is a combination of multiple low level contributors that, due to some masking and some dropout, produce a profile where the apparent number of contributors is fewer than the known number of contributors. This is the low level donors' scenario.

Each of these is discussed in turn below.

4.1.1. The tiny minor

Any profile is a result of fragments of DNA that have been aliquoted from a DNA extract and then amplified during PCR. There exists a possibility that no DNA fragments from a minor DNA donor have been sampled for PCR. We first ask what we consider to be the correct number of contributors; the number of different individual's DNA in the DNA extract, or the number of different individual's DNA in the PCR? If it is the former, then we would ask; if the individual has contributed so little DNA that the observed fluorescence in the DNA profile is not affected by their presence, then what purpose is served by considering them as a contributor? We note that many of the underestimates of number of contributors in this study arise from such situations.

4.1.2. The hidden contributor

Consider a DNA profile where multiple individuals, are contributing to a DNA profile, however they possess sufficient allelic overlap so that the DNA profile appears as a lower order mixture. The apparent number of contributors being lower than the known number of contributors relies on the DNA profile being formed in such a way that peak imbalances will not indicate the true number of contributors. For example, a combination of two individuals who are homozygous at each locus, combined in equal proportions to a DNA sample will always appear single source. However, this risk of multiple contributors being combined to meet these specifications is very remote, and artificial. It only tends to occur in mixtures of family members, such as a child and their parents donating equal amounts of DNA to a sample. The Coble et al. [26] experiment is valuable but does not take into account peak heights, and so the study does not reflect the information that peak heights provide analysts in their assignment of *N*. This is evident in the difference between the results obtained by Coble et al. and our work. For example, Coble et al. reported the probability of a known five person mixture presenting as an apparent five person mixture was less than 0.01, whereas in our study, based on human assignment, this probability is 0.36 (and noting that many of the remaining mixtures fall

into the tiny minor and low donor scenarios).

4.1.3. The low level donors' scenario

This scenario is where there are multiple low level contributors, who are present in low amounts such that they exhibit significant dropout and so in combination the apparent number of contributor is fewer than the known number of contributors. This is a scenario that could plausibly occur with reasonable probability when multiple low level contributors are present (see [16] for an exploration of this). Experimentation has shown that very low level contributors will yield *LR*s of approximately one. It is likely that when analysed under the known number of contributors, all true (and a majority of false) contributors give this neutral *LR* value. In other words, the profile does not have the information in order to distinguish true from false donors. If analysed as the apparent number of contributors then the likely outcome is an exclusion of the known contributors (and more exclusions of non contributors). The primary difference in *LR* between known and apparent number of contributors is between neutral and possibly exclusionary, which we could argue presents less risk of misleading a court.

4.1.4. Overestimating the number of contributors

Our studies show that the chance of overestimating *N* in relation to the known value is less common than underestimation and cannot be predicted so easily by simulation as in Coble et al. [26]. It requires two events to occur:

- 1) There is a stochastic event, such as a peak imbalance, high stutter or drop in, which occurs at an improbable level,
- 2) The analyst interpreting the profile feels that the out of place fluorescence has resulted in a profile that is more likely to exist if it has originated from more contributors than the known number of contributors.

Fig. 7 shows that the effect of overestimation of *N* is relatively mild on known contributors to a DNA profile. STRmix™ assigns near zero mass to the non existent contributor, leaving the other contributors relatively unchanged. The largest effect is to decrease the *LR* for minor known contributors. For non contributors, Fig. 8 shows the effect that has previously been described, i.e. that an overestimation of *N* tends to increase low level *LR*s for non contributors. In effect the experiment is showing the practical functioning of the catch all statement suggested earlier.

Our findings show that as mixture complexity increases, the ability of an analyst to designate the known number of contributor is reduced. As explained, it is actually often the apparent number of contributors that is the more appropriate value to choose for analysis. In assigning apparent number of contributors the overwhelming result is alignment with the desired trends in *LR*s with regards to profile complexity and DNA amount (i.e. those described in [21], where known number of contributors was used for all analyses) are obtained. In the rare circumstances where the known contributors were not supported as donors of DNA to the profile, this was due to one of the three under estimate conditions described above in 4.1.1 through 4.1.3 above.

4.2. Performance as a function of amount of allele sharing

Within Fig. 10 the trend is that the greater the allele sharing, the less the power to discriminate a true contributor from a non contributor. However, this relationship is dominated by the number of contributors within the mixture (as seen in Fig. 11). Higher order mixtures result in less informative *LR*s. This effect is related more to the number of contributors within a mixture than the amount of allele sharing between contributors within the mixture. There is a relationship between the number of contributors and proportion of allele sharing within a mixture. It has previously been shown that the probability of a higher order mixture appearing as having originated from one fewer individual

based on allele count alone is high [26,27]. For example, Coble et al. calculated the probability of a six contributor profile appearing as a five contributor profile based on allele count as 0.8599 for the GlobalFiler™ 24 locus multiplex [26]. The study by Coble et al. did not take into account peak height, thereby making the values in their study a worst case scenario.

4.3. Performance of the system with regards to amount of DNA

In principle, we observe less discriminatory *LR*s for true and non contributors when the *APH* (template) decreases per contributor. Again, this does not mean that mixed DNA profiles with contributors containing less DNA are unreliable, just they are less informative with respect to the true and non contributors.

PCAST describe limits on PG reliability based on mixture proportion and number of contributors. Per contributor template is more informative of *LR* than mixture proportion. With respect to mixture proportion, the limit is not the software but the hardware. For example, assuming a minor contributor's alleles within a mixture are present just above the analytical threshold of a 3130 (typically 50 rfu) and a major contributor's alleles are at the saturation limit (typically 7000 rfu), this would be maximum mixture proportion of 140:1. 2293 out of the 2825 submitted profiles had at least one component who contributed less than 20% of the sample.

5. Conclusion

In their review of published literature validating probabilistic genotyping, PCAST surmised that the limits of foundational validity extended to three person mixtures where the person of interest made up at least 20% of the profile. What was not taken into account during the PCAST review was a wealth of unpublished validation material residing in laboratories that had validated (or were in the process of validating) probabilistic genotyping software. Due to our involvement with STRmix™ we are aware of the breadth of such validation material for STRmix™ specifically, and assume that similar material must be present for other probabilistic genotyping systems. A disconnect exists between the PCAST desire for laboratories to publish their validation material in peer reviewed journals and the general resistance to such publications by the journals themselves. This is for the completely understandable reason that they are generally not novel, or, individually, of general interest to the forensic community.

PCAST has said “When further studies are published, it will likely be possible to extend the range in which scientific validity has been established to include more challenging samples. As noted above, such studies should be performed by or should include independent research groups not connected with the developers of the methods and with no stake in the outcome.”

There has already been an example of published material that extend the PCAST limits, from the Forensic Biology laboratory at the Federal Bureau of Investigation [14]. We add to that published work, by compiling the STRmix™ validation material from 31 laboratories, which allows a novel look at data spanning laboratory technology and process. PCAST highlighted four key areas that they felt additional validation would be merited:

- (1) How well does the method perform as a function of the number of contributors to the mixture? How well does it perform when the number of contributors to the mixture is *unknown*?
- (2) How does the method perform as a function of the number of alleles shared among individuals in the mixture? Relatedly, how does it perform when the mixtures include related individuals?
- (3) How well does the method perform and how does accuracy degrade as a function of the absolute and relative amounts of DNA from the various contributors?

- (4) Under what circumstances and why does the method produce results (random inclusion probabilities) that differ substantially from those produced by other methods?

We address points 1 to 3 in this study. It is unknown whether further addendums will be released by the PCAST group, or whether there are any plans for a follow up study in the future. The material we provide here demonstrates a foundational validity of, at least, the STRmix™ software method for complex, mixed DNA profiles to levels well beyond the complexity and contribution levels suggested by PCAST. The study was done in accordance with the specific manner outlined in the PCAST report.

Acknowledgements

This work was supported in part by grant 2011 DN BX K541 from the US National Institute of Justice. Points of view in this document are those of the authors and do not necessarily represent the official position or policies of their organisations. The authors would like to thank Professor James Curran for his help in creating the plots in Fig. 1.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.fsigen.2018.01.003>.

References

- [1] President's Council of Advisors on Science and Technology, PCAST Releases Report on Forensic Science in Criminal Courts, (2016).
- [2] President's council of advisors on science and technology, An Addendum to the PCAST Report on Forensic Science in Criminal Courts, (2016).
- [3] A.A. Mitchell, J. Tamariz, K. O'Connell, N. Ducasse, Z. Budimlija, M. Prinz, et al., Validation of a DNA mixture statistics tool incorporating allelic drop-out and drop-in, *Forensic Sci. Int. Genet.* 6 (2012) 749–761.
- [4] M.W. Perlin, M.M. Legler, C.E. Spencer, J.L. Smith, W.P. Allan, J.L. Belrose, Validating TrueAllele™ DNA mixture interpretation, *J. Forensic Sci.* (2011) 2011.
- [5] J.-A. Bright, D. Taylor, C.E. McGovern, S. Cooper, L. Russell, D. Abarno, et al., Developmental validation of STRmix™, expert software for the interpretation of forensic DNA profiles, *Forensic Sci. Int. Genet.* 23 (2016) 226–239.
- [6] F.M. Götz, H. Schönborn, V. Borsdorf, A.-M. Pflugbeil, D. Labudde, GenoProof Mixture 3—New software and process to resolve complex DNA mixtures, *Forensic Sci. Int. Genet. Suppl. Ser.* (2017).
- [7] S. Manabe, C. Morimoto, Y. Hamano, S. Fujimoto, K. Tamaki, Development and validation of open-source software for DNA mixture interpretation based on a quantitative continuous model, *PLoS One* 12 (2017) e0188183.
- [8] Scientific Working Group on DNA Analysis Methods (SWGDM), Guidelines for the Validation of Probabilistic Genotyping Systems, (2015).
- [9] M.D. Coble, J. Buckleton, J.M. Butler, T. Egeland, R. Fimmers, P. Gill, et al., DNA Commission of the International Society for Forensic Genetics: recommendations on the validation of software programs performing biostatistical calculations for forensic genetics applications, *Forensic Sci. Int. Genet.* 25 (2016) 191–197.
- [10] D. Taylor, J.-A. Bright, J. Buckleton, The interpretation of single source and mixed DNA profiles, *Forensic Sci. Int. Genet.* 7 (2013) 516–528.
- [11] J.-A. Bright, D. Taylor, J.M. Curran, J.S. Buckleton, Developing allelic and stutter peak height models for a continuous method of DNA interpretation, *Forensic Sci. Int. Genet.* 7 (2013) 296–304.
- [12] The New York City Office of Chief Medical Examiner, Internal Validation of STRmix™ V2.4 for Fusion NYC OCME, (2016).
- [13] District of Columbia Department of Forensic Science Forensic Science Laboratory Forensic Biology Unit. Internal Validation of STRmix™ V2.3, (2015).
- [14] T.R. Moretti, R.S. Just, S.C. Kehl, L.E. Willis, J.S. Buckleton, J.-A. Bright, et al., Internal validation of STRmix for the interpretation of single source and mixed DNA profiles, *Forensic Sci. Int. Genet.* 29 (2017) 126–144.
- [15] T.R. Moretti, L.I. Moreno, J.B. Smerick, M.L. Pignone, R. Hizon, J.S. Buckleton, et al., Population data on the expanded CODIS core STR loci for eleven populations of significance for forensic DNA analyses in the United States, *Forensic Sci. Int. Genet.* 25 (2017) 175–181.
- [16] D. Taylor, J. Buckleton, J.-A. Bright, Does the use of probabilistic genotyping change the way we should view sub-threshold data, *Aust. J. Forensic Sci.* 49 (2017) 78–92.
- [17] D. Taylor, J. Buckleton, I. Evtet, Testing likelihood ratios produced from complex DNA profiles, *Forensic Sci. Int. Genet.* 16 (2015) 165–171.
- [18] J.-A. Bright, D. Taylor, J. Curran, J. Buckleton, Searching mixed DNA profiles directly against profile databases, *Forensic Sci. Int. Genet.* 9 (2014) 102–110.
- [19] J.-A. Bright, J.M. Curran, J.S. Buckleton, The effect of the uncertainty in the number of contributors to mixed DNA profiles on profile interpretation, *Forensic Sci. Int.*

- Genet. 12 (2014) 208–214.
- [20] J.L. Hintze, R.D. Nelson, Violin plots a box plot-density trace synergism, *Am. Stat.* 52 (1998) 181–184.
- [21] D. Taylor, Using continuous DNA interpretation methods to revisit likelihood ratio behaviour, *Forensic Sci. Int. Genet.* 11 (2014) 144–153.
- [22] H. Wickham, *Ggplot2—Elegant Graphics for Data Analysis*, 2nd edition, Springer-Verlag, New York, 2016.
- [23] Applied Biosystems User Bulletin Applied Biosystems® 3500/3500xL Genetic Analyzer, Life Technologies internal report, Foster City, CA), 2011.
- [24] D. Taylor, J. Buckleton, J.-A. Bright, Factors affecting peak height variability for short tandem repeat data, *Forensic Sci. Int. Genet.* 21 (2016) 126–133.
- [25] D.J. Balding, R.A. Nichols, DNA profile match probability calculation: how to allow for population stratification, relatedness, database selection and single bands, *Forensic Sci. Int.* 64 (1994) 125–140.
- [26] M.D. Coble, J.-A. Bright, J.S. Buckleton, J.M. Curran, Uncertainty in the number of contributors in the proposed new CODIS set, *Forensic Sci. Int. Genet.* 19 (2015) 207–211.
- [27] J.S. Buckleton, J.M. Curran, P. Gill, Towards understanding the effect of uncertainty in the number of contributors to DNA stains, *Forensic Sci. Int. Genet.* 1 (2007) 20–28.

RE: Talkers on PCAST

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Mon, 18 Sep 2017 18:16:42 -0400

Thanks – will take a look...

From: Antell, Kira M (OLP)
Sent: Monday, September 18, 2017 6:11 PM
To: Hunt, Ted (ODAG) (b) (6)
Subject: Talkers on PCAST

Hi Ted,

I took a crack at putting together your talkers for the FRE → you'll note plenty of overlap with the background section I sent you. See what you think about this. Do you think you could put in a section about (b)(5) I'd also like to beef up the (b)(5)

Let me know what you think

Thanks,
K

Kira Antell
Senior Counsel
Office of Legal Policy
U.S. Department of Justice
950 Pennsylvania Avenue, NW
Washington, DC 20530
(b) (6)
(b) (6)

SJC_TPs_10122017

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Thu, 12 Oct 2017 12:31:08 -0400
Attachment SJC TP 10122017 doc (29 66 kB)

Hi Ted,

TPs for SJC staff. Pulled right from NAS. I know you will just be using these as an outline and not reading them but I wanted to include the details so we could share with Lindsay. Once you've looked them over and made any edits I'll kick them to her.

-K

TPs for CrCWG_09152017

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Fri, 15 Sep 2017 11:11:41 -0400
Attachment TP for CrCWG 09152017 doc (24 29 kB)

Hi Ted,

Attached are my draft TPs for the CrCWG meeting next week. I plan to speak for no more than 10 minutes and then kick it to you to have a genuine exchange with the group. We will be there for Betsy's discussion as well.

Thanks,
K

RE: DRAFT Remarks

From: "Crowell, James (ODAG)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Cc: "Hur, Robert (ODAG)" <(b) (6)>
Date: Mon, 18 Sep 2017 14:24:19 -0400

Good by me

From: Hunt, Ted (ODAG)
Sent: Friday, September 15, 2017 11:23 AM
To: Crowell, James (ODAG) <(b) (6)>; Hur, Robert (ODAG) <(b) (6)>
Subject: DRAFT Remarks

Jim/Rob:

Attached above are draft remarks that I've prepared for a talk I'm giving next week (Wednesday) to the Kansas Bureau of Investigation and the Kansas Attorney General's Office at the KBI's new lab in Topeka, KS.

These remarks have already been reviewed by OLP. Note that they contain a couple references to the PCAST Report, and that these are ODAG's first public comments on that Report.

Please let me know if you have any questions or comments.

Thanks,

Ted

Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave, NW
C. 20530

(b) (6)

Proposed Talkers for Call with Judge Livingston on 702

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Mon, 18 Sep 2017 17:06:01 -0400
Attachment Propo ed Talker for Call with Judge Living ton on 702 doc (22 68 kB)

Hi Ted,

See what you think about these talkers and background. If you like, you can drop your section in and then we can send to Betsy and Andrew.

-K

Kira Antell
Senior Counsel
Office of Legal Policy
U.S. Department of Justice
950 Pennsylvania Avenue, NW
Washington, DC 20530

(b) (6)
(b) (6)

FW: Talkers on PCAST for FRE

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Thu, 28 Sep 2017 17:52:21 -0400
Attachment Ted Hunt Propo ed Talker on PCAST doc (24 87 kB)

Hi Ted,

Wanted to follow up on this. I don't think you've responded. If you have it all under control and do not need anything from me, that's great but want to be helpful.

-K

From: Antell, Kira M. (OLP)
Sent: Monday, September 25, 2017 10:52 AM
To: Hunt, Ted (ODAG) <(b) (6)>
Subject: Talkers on PCAST

Hi Ted,

(b)(5)



Let me know what you think.

Thanks,
K

Kira Antell
Senior Counsel
Office of Legal Policy
U.S. Department of Justice
950 Pennsylvania Avenue, NW
Washington, DC 20530

(b) (6)
(b) (6)

RE: KBI Speech-DRAFT_KMA

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Wed, 13 Sep 2017 12:44:29 -0400

Great. Thanks very much!

From: Antell, Kira M (OLP)
Sent: Wednesday, September 13, 2017 12:25 PM
To: Hunt, Ted (ODAG) (b) (6)
Subject: KBI Speech-DRAFT_KMA

See what you think about my suggestions in redline. (b)(5)

Fwd: PCAST opinion

From: Amie Ely (b) (6) naag.org>
To: (b) (6), (b) (6) Kira M Antell (OLP), "Hunt, Ted (ODAG)" <(b) (6)>
Date: Mon, 11 Jun 2018 11:39:13 -0400
Attachment Black tone Robin on Gilligan Order and Memorandum pdf (888 05 kB)

From: Lauren Zurier <(b) (6) Rhode Island >
Sen
To: (b) (6)
Subject: PCAST opinion

Hi, all.

Excellent PCAST-related trial court opinion on DNA mixtures attached, courtesy of Jonathan Holets.

Lauren S Zurier
Special Assistant Attorney General
R I Dep't of Attorney General
150 South Main St.
Providence R I 02903

(b) (6)
(b) (6) (direct dial)
(b) (6) (fax)

STATE OF MINNESOTA
COUNTY OF RAMSEY

DISTRICT COURT
SECOND JUDICIAL DISTRICT

STATE OF MINNESOTA,

FILE NO. 62-CR-15-935

Plaintiff,

vs.

DEANDRE LASHAWN ROBINSON,

Defendant.

STATE OF MINNESOTA,

FILE NO. 62-CR-16-45

Plaintiff,

vs.

JAMONI RAEKWON BLACKSTONE,

Defendant.

ORDER AND MEMORANDUM

The above-entitled matters were consolidated for hearings before the court on the motions of Defendants Deandre Lashawn Robinson and Jamoni Raekwon Blackstone to exclude DNA evidence as lacking foundational reliability, the product of a scientific method not generally accepted under *Frye-Mack*, and inadmissible pursuant to Minn. R. Evid. 403. A hearing was held on June 26-28, 2017 and July 31, 2017. The State was represented by Assistant

County Attorney Elizabeth Lamin in the *Robinson* case. Robinson was present at all hearings¹ and was represented by attorney Aaron Haddorff. The State was represented by Assistant County Attorney Daniel Vlieger in the *Blackstone* case. Blackstone was present during the hearing on June 26, 2017; however, he requested to be excused from the remainder of the proceedings and made a valid waiver on the record. He was represented by attorney Katherine Conners.

Robinson was charged under Minn. Stat. § 624.713, subd. 1(2) for possessing a firearm on July 8, 2014, as a person ineligible for such possession due to a prior conviction for Aggravated Robbery in the First Degree. The firearm allegedly possessed by Robinson was swabbed for DNA. The DNA samples from the firearm were tested by DNA Analyst McKenzie Anderson from the Minnesota Bureau of Criminal Apprehension (BCA) and compared to a sample of Robinson's DNA. The DNA sample taken from the firearm's grip revealed a DNA profile from four or more individuals and that Robinson could not be excluded from being a contributor to the mixture, but 46.3% of the general population could be excluded. The DNA sample taken from the firearm's trigger, hammer and cylinder revealed a DNA profile from three or more individuals and that Robinson could not be excluded from being a contributor to the mixture, but 71.2% of the general population could be excluded.

Blackstone was also charged under Minn. Stat. § 624.713, subd. 1(2) for possessing a firearm on June 24, 2015, as a person ineligible for such possession due to a prior conviction for Threats of Violence. The firearm allegedly possessed by Blackstone was swabbed for DNA. The DNA samples from the firearm were tested by DNA Analyst Allison Dolenc from the BCA and compared to a sample of Blackstone's DNA. The DNA samples taken from the slide,

¹ Robinson was briefly absent from the hearing on June 28, 2017, but made a valid waiver on the record and resumed his appearance during the remainder of the proceedings.

hammer and levers of the firearm revealed a DNA mixture of five or more individuals and that DNA from the major profile matched the DNA of Blackstone. This major DNA profile would not be expected to occur more than once among unrelated individuals in the world population.

Both Defendants move to exclude the evidence of the DNA analysis performed by the scientists of the BCA. Specifically, Defendants challenge the foundational reliability of the opinions of the BCA's DNA Analysts regarding DNA testing done of samples from the recovered firearms. Defendants also contend that the opinions of the DNA Analysts are not admissible under *Frye-Mack* because the methods they used to test DNA are not generally accepted in the scientific community. Finally, Defendants contend that the opinions of the DNA Analysts are inadmissible because they are irrelevant and that any probative value of such opinions are substantially outweighed by the danger of unfair prejudice.

The State opposes the motions. The State contends that: 1) the DNA Analysts were qualified and their opinions therefore have foundational reliability; 2) the DNA testing and methods used in these cases were not novel scientific techniques and are generally accepted methods of DNA analysis; 3) the DNA testing and methods used in both cases have foundational reliability; and 4) the DNA results are relevant and that their probative value is not substantially outweighed by the danger of unfair prejudice.

The State called one witness, Marlijn Hoogendoorn, PhD, Technical Leader of the Biology Section of the BCA. The Defendants called one witness, Norah Rudin, PhD, a specially-retained expert witness and forensic consultant in the field of DNA analysis. The Defendants submitted 37 exhibits in support of their motions. The State submitted 28 exhibits in opposition to the motions. All exhibits were received into evidence by stipulation.


At the conclusion of the hearing, the parties requested transcripts of the four days of testimony. They also requested an opportunity to submit written briefs. Defendants submitted timely briefs on January 5, 2018. The State requested extensions, which were granted, and timely submitted briefs on February 16, 2018. On that date, the motions were taken under advisement.

Based upon all the files, records and proceedings herein, the arguments of counsel, and the court being fully advised, now makes the following:

Order

1. Defendant Deandre Lashawn Robinson's motion to exclude DNA evidence is **DENIED.**
2. Defendant Jamoni Raekwon Blackstone's motion to exclude DNA evidence is **DENIED.**
3. The attached Memorandum shall be incorporated into this Order.

May 4, 2018
DATE



THOMAS GILLIGAN
JUDGE OF DISTRICT COURT

Memorandum

Defendant Deandre Lashawn Robinson moves to exclude the results of DNA testing performed by BCA DNA Analyst McKenzie Anderson on a firearm he is accused of possessing. The *Robinson* case has been characterized as a “true mixture case.” Likewise, Defendant Jamoni Raekwon Blackstone moves to exclude the results of DNA testing performed by BCA DNA Analyst Allison Dolenc on a firearm he is accused of possessing. The *Blackstone* case has been characterized as a “major profile case.” Although the DNA test results in both cases have different outcomes, the results in each case involved the interpretation of complex DNA mixtures.

The Defendants do not broadly attack the underlying science of using DNA as a forensic identification tool. Nor do Defendants narrowly attack the qualifications of the DNA analysts of the BCA or the efficacy of their work. Rather, the essential basis for exclusion advanced by Robinson and Blackstone is that the BCA’s procedures for interpretation of complex DNA mixtures are not reliable, consistent or accurate. Both Defendants attack the validation studies which underlie the BCA’s procedures regarding interpretation of complex DNA mixtures. Both Defendants also contend that the BCA’s procedures and methodology don’t meet national standards, guidelines and prevailing opinions in the forensic community for the interpretation of complex DNA mixtures. Essentially, Defendants contend while the BCA is utilizing methods with an increased sensitivity of detection which result in complex DNA mixtures, the BCA’s methods and procedures do not provide a valid and reliable way to interpret those complex mixtures. Finally, Robinson and Blackstone contend that the probative value of the DNA test results is substantially outweighed by their potential for unfair prejudice. In essence, Defendants

contend that the impact of the DNA test results in a complex mixture case is “wildly inflated” and therefore inadmissible.

The State opposes the motions in both cases and contends that the DNA test results are based on sound and current science, validated scientific methodology and protocols, and were performed by an accredited laboratory. The State also contends that the DNA test results are admissible and not out of proportion, because they are simply one piece of evidence that a fact finder could consider and are also subject to rigorous cross-examination.

Overview of DNA Analysis and Interpretation

A DNA profile is the genetic constitution of an individual at defined locations, also known as loci, in the DNA. Exhibit 10, p. 4. A DNA profile derived from nuclear DNA typically consists of one or two alleles at several loci. *Id.* “When more than two actual alleles are observed in the testing results from any single locus, it can be reasonably assumed that the presence of DNA from more than one contributor is the most likely explanation.” Exhibit 73, p. 1. “A DNA mixture refers to a biological sample that originated from two or more donors and is determined after a DNA profile is generated.” Exhibit 2, p. 2. “A complex DNA mixture may contain more than two donors, one or more of the donors may have contributed a low amount of DNA template, or the sample may be somewhat degraded.” *Id.* A complex DNA mixture may come from “touch DNA,” which is DNA not linked to a bodily fluid and typically found because a person or persons handled an object and left skin cells behind.

“In current forensic investigations DNA mixtures occur commonly.” *Id.* Crime laboratories are being asked to evaluate many more complex DNA mixtures and the forensic community is utilizing methods with an increased sensitivity of detection due to improvements

in technology, which in turn, enable analysis of more challenging and complex mixtures. *Id.* “Interpreting evidence samples containing mixed DNA profiles is more complicated than the analysis of single source samples.” Exhibit 73, p. 1. Analysis of a multiple contributor sample is particularly challenging when potential contributors have several alleles in common, when stochastic variations in peak heights occur, or when technical artifacts such as stutter (an allele in a nearby position), allelic dropout (allele should be present, but cannot be seen), and degradation/inhibition occur. *Id.*

Forensic DNA analysis is the process of using identification and evaluation of biological evidence in criminal matters using DNA technologies. Exhibit 10, p. 4. “Interpretation of forensic DNA evidence is a very important part of the analytical process.” Exhibit 3, p. 1. Interpretation of forensic DNA evidence involves a comparison of evidentiary or question samples to known or reference samples. Exhibit 62, p. 1. This interpretation “requires human processing and experiences with the nuances of interpreting evidentiary and reference profiles.” Exhibit 3, p. 1. “Because mixed samples can present interpretive challenges, basic assumptions must be stated and well-defined empirical parameters must be established by any laboratory conducting forensic casework.” *Id.*

DNA labs typically use software to analyze raw data which comes from DNA test results. The software produces an electropherogram, which show peaks at the examined loci if DNA is present in a sample. A peak’s height reflects the quantity and quality of genetic information at a particular locus. The challenge for the DNA Analyst is to differentiate peaks which are actual alleles from peaks which are artifacts, which may, for example, be caused by the operation of the technology being used by the analyst. A stochastic threshold, otherwise known as a minimum interpretation threshold (MIT), reflects a value at which no dropout is detected in single source

DNA samples. A minimum detection threshold (MDT), is the point at which an analyst can confidently differentiate an allele from baseline. MITs and MDTs may vary from lab to lab or instrument to instrument. A DNA laboratory must therefore conduct validation studies which inform the assignment of these thresholds.

The combined probability of inclusion (CPI) is the most commonly used method in most of the world to assign the weight of evidence where a probative profile is obtained from an evidentiary sample. Exhibit 2, p. 2. “The CPI refers to the proportion of a given population that would be expected to be *included* as a potential contributor to an observed DNA mixture.” *Id.* (emphasis added). “The complement of the CPI is the combined probability of exclusion (CPE).” *Id.* CPE is reported as a percentage of individuals who would be *excluded* from being a potential contributor to an observed DNA mixture. “Profile interpretation and CPI calculation involves three steps: assessment of the profile, comparison with reference profiles and inclusion/exclusion determination, and calculation of the statistic.” *Id.* The CPI/CPE “does not require any assumptions or estimates of the number of contributors that comprise [a DNA] mixture.” Exhibit 3, p. 8. This method has been the subject of some criticism, because it has been applied incorrectly, particularly in complex mixture interpretation. Exhibit 2, p. 2. According to at least one published paper, “it is incumbent upon the user to evaluate a mixture based on the possible genotypes of the contributors and to consider the potential of missing data (i.e., allele dropout) based on peak height observations at other loci in the profile and the possibility of allele stacking.” *Id.*

“For a distinguishable mixed specimen with an interpretable major and/or minor contributor...a combined multi-locus random match probability calculation should be performed for the major contributor in accordance with a laboratory’s established procedures for single

source profiles and where possible for the minor contributor.” Exhibit 3, p. 11. Laboratories must have sufficiently detailed procedures to “ensure confidence in the separation of the ‘major’ versus the ‘minor’ component.” Exhibit 58, p. 5.

Scientists seem to agree that interpreting complex DNA mixtures is difficult and that the trend in DNA forensic science for the interpretation of complex mixtures is towards the use of probabilistic genotyping. That method tries to take into account the number of contributors, peak heights, degradation, template, stutter, dropout, and amplification efficiency. In the words of one prominent forensic DNA scientist: “Complex DNA mixtures, containing genetic data from more than two individuals, especially if any of the individuals are related, offer one of the largest challenges for the future of forensic DNA analysis. Probabilistic genotyping offers a way to strengthen conclusions with challenging DNA mixture results that might otherwise be declared inconclusive under a binary approach to interpretation.” Exhibit 62, pp. 6-7. There does, however, appear to be recognition that binary approaches of interpretation remain valid, but disagreement on when such approaches are appropriate.

In the meantime, many labs, including the BCA, continue to use the CPI/CPE based approaches. Exhibit 2, p. 3. Noted scientists have advocated a protocol, therefore, which will guide practitioners in the continued use of CPI/CPE based approaches. *Id.* The continued use of CPI/CPE method is dependent upon a detailed DNA mixture protocol, and upon valid MDT, MIT, and other values and ratios. Exhibit 2, pp. 4, 12. Also, according to one published paper, “it is essential that application of the CPI be performed by well-trained professionals using their judgement and knowledge...their professional education, and relevant experience.” *Id.* Interpretation “requires human processing and experience with the nuances of interpreting evidentiary and reference profiles.” Exhibit 3, p. 1. “As much as it is the responsibility of the

forensic scientist to not overstate the significance of a test result, an equally important tasking is that an analyst should not ignore defensible conclusions in a mistaken effort to be 'conservative.' Conclusions so 'conservative' that they strip away supportable elements of their meaning (i.e., grossly understate) are effectively rendered inaccurate and are no less unsuitable for reporting than an inaccurate over-statement of a conclusion." Exhibit 3, p. 12.

The Bureau of Criminal Apprehension DNA Section's Accreditation and Audit History

The BCA has a DNA Section, which performs forensic DNA analyses and did the analysis of the subject samples in this case. It is accredited by the American Society of Crime Lab Directors Laboratory Accreditation Board (ASCLD/LAB). ASCLD/LAB conducts accreditation audits of labs every five years. It also conducts audits against Quality Assurance Standards for Forensic DNA Testing Laboratories (QAS) issued by the Federal Bureau of Investigation (FBI). The QAS sets, among other things, standards for the use of validated methodologies for DNA analyses, administrative and technical review, proficiency testing, and internal and external audits. The QAS applicable in this case, was effective September 1, 2011. ASCLD/LAB audits DNA labs for QAS compliance once every two years through volunteer auditors who are DNA scientists from other labs and trained to perform such audits. On "off" years, the DNA lab must perform an internal audit against the QAS to maintain compliance. All forensic scientists at the BCA are subject to the QAS, which includes specific educational requirements, continuing education, literature review, and proficiency testing.

As additional guidance to DNA testing labs, the Scientific Working Group on DNA Analysis Methods (SWGDM) promulgates guidelines for forensic DNA labs and analysis. SWGDM is comprised of qualified working forensic lab scientists. These guidelines cover

topics such as mixture interpretation and validation procedures. The most recent interpretation guidelines applicable to these cases were promulgated in 2010. Significantly, the 2010 interpretation guidelines provided guidance on the interpretation of DNA mixtures. The guidelines recommended: “that standard operating procedures for the interpretation of DNA typing results be sufficiently detailed that other forensic DNA analysts can review, understand in full, and assess the laboratory’s policies and practices. The laboratory’s interpretation guidelines should be based on validation studies, scientific literature, and experience.” Exhibit 11, pp. 1-2. The most recent validation guidelines applicable to these cases were promulgated in 2012. The guidelines were updated “to assist laboratories in establishing reliable methods for DNA analysis and identifying limitations of the procedures.” Exhibit 57, p. 2. Further, SWGDAM indicated that the labs “must determine which validation studies are relevant to the methodology, in the context of its application, and determine the number of samples required to satisfy each study.” *Id.* Although the SWGDAM guidelines have been updated, they are not meant to be applied retroactively. *Id.*

The BCA’s DNA Section was subjected to an external ASCLD/LAB audit in 2014. The audit was conducted by qualified DNA scientists, who have taken the FBI quality assurance auditor training class. The initial audit found that the DNA Section was not in compliance with QAS standard 8.3.2. The findings indicated: “The laboratory has validated standard DNA methods using 2 and 3 person mixtures. DNA personnel are interpreting and reporting mixtures of 4 or more people. The validation is not as extensive as necessary to meet the needs of the application.” Exhibit 13 (141015), p. 91. The BCA appealed this finding to the FBI National DNA Index System (NDIS) Audit Review Panel.

In the appeal, the BCA contended that its validation and experience provided an adequate basis to interpret complex mixtures of more than three persons. The BCA performed mixture interpretation validation studies on the Identifiler kit (the same instrument used for the analyses in these cases) in 2004 and 2007. Those validations “consisted of sensitivity studies, evaluation of stochastic effects, and 2-and 3-person mixture studies” and that it had been subjected to external QAS audits and accreditation by ASCLD/LAB and found compliant. Exhibit 14, p. 3.

The BCA summarized its compliance contention as follows:

The BCA Laboratory is not using non-standard methods or applying standard methods outside of their intended scope. Our validations sufficiently support our interpretation of mixtures and our use of CPE for statistical calculations for all mixtures. Since the original validation, we have gained more than nine years of experience in analyzing mixtures with the Identifiler kit, and scientists from the BCA Laboratory have testified to our analysis results in court for thousands of cases involving mixtures.

We would like to point out that the QAS allow for a wide range of interpretations of mixtures, from not conducting any mixture interpretation to interpretation of complex DNA mixtures. The BCA Laboratory has and follows Standard Operating Procedures and has validated its methods for conducting mixture analysis. We are in compliance with QAS Standard 8.3.2 because our interpretation guidelines are based directly on our internal validations. Furthermore, there is currently no consensus in the Forensic DNA community on what constitutes the “best” method of mixture analysis, including statistical calculations. Recently there have been a number of workshops and publications addressing DNA mixture interpretation, and there is a lot of debate on this topic among practitioners. Presenting the point of view from one practitioner without acknowledging the debate on this topic is greatly misrepresenting the scientific discourse currently ongoing on this topic.

Id., p. 3. On December 11, 2014, the NDIS Custodian wrote the BCA: “A review of your audit documentation found your laboratory to be in compliance with the external audit requirements and the FBI Director’s Quality Assurance Standards. Based upon this review, the NDIS Audit Review Panel **overturned** the finding associated with Standard 8.1/8.3.2.” Exhibit 54 (Closure QAS Audit Review)(emphasis in original). The Final Assessment Report of ASCLD/LAB was issued on December 15, 2014 and found that the DNA laboratory was in conformance with all

ASCLD/LAB accreditation requirements, with the exception of a corrective action not relevant to these cases. Exhibit 54 (141215), p. 3.

Approximately six months later in 2015, ASCLD/LAB released a position statement about the interpretation of DNA profiles containing a mixture of two or more individuals. The position statement provided in part: “DNA mixture interpretation procedures must be tested on mixture profiles from known contributors representing the range of mixture types (e.g., different numbers of contributors, mixture proportions, and template quantities) to which the procedure will be applied in casework. The results of this validation must be used to define the capabilities and limitations of the procedure and to verify that it produces the expected results (e.g., inclusions and exclusions).” Exhibit 59, p. 3. Apparently, this position statement generated questions and confusion. In response to this reaction among the forensic DNA community, ASCLD/LAB issued a clarification, which indicated that the intent “was for making sure that the *current* DNA mixture protocol in use in your lab, the one you’ve already validated and the protocol your analysts have been and are using, is effective and producing accurate and reliable results for the number of mixture contributors being reported by analysts in your laboratory.” Exhibit 60, p. 1 (emphasis in original).

In response to the ASCLD/LAB position statement, the BCA completed a performance check of its mixture interpretation guidelines in February of 2016. Six BCA DNA Analysts independently analyzed DNA mixtures comprised of four and five known contributors, using its current procedures. The performance check revealed that the scientists reached the same conclusion in their interpretations. Exhibit 19, p. 3. The DNA Section was also selected for an expanded surveillance visit by ASCLD/LAB through a qualified technical assessor and an ASCLD/LAB staff inspector. During the surveillance visit, the assessors reviewed and evaluated

the DNA Sections' case records, procedures, and validations. The assessors also specifically reviewed the results of the performance check of the BCA's mixture interpretation guidelines. On July 26, 2016, ASCLD/LAB found that the DNA Section's "operations are in conformance with applicable accreditation requirements."

The BCA completed its original validation study in 2004 with two- and three-person mixtures. It did not initially use more complex mixtures, because the DNA Section did not typically analyze very complex mixtures. Over time, the BCA conducted additional validation studies with two- and three-person mixtures and ultimately four- and five-person mixtures. The DNA Section completed a complex mixture study in October of 2016 using Identifiler data generated in 2014 and 2015. Exhibit 18.

The President's Council of Advisors on Science and Technology ("PCAST") was an advisory council to the President of the United States. President Barack Obama appointed a full complement of advisors to the council.² PCAST issued a report on September 20, 2016. The report discussed different forensic disciplines, including DNA analysis. The report characterized DNA testing involving single-source and simple mixtures as foundationally valid and DNA testing involving mixtures not foundationally valid. Exhibit 61A, pp. 73, 81. The report also criticized the use of combined probability of inclusion or CPI. *Id.*, p. 82. Following its publication, the report received criticism in the forensic and law enforcement communities. The FBI, U.S. Department of Justice, ASCLD and the BCA, among others, issued position statements which responded to the PCAST report. The criticism included: 1) PCAST membership lacked

² The current President has appointed no members to this council and it no longer appears to be functioning. https://en.wikipedia.org/wiki/United_States_President%27s_Council_of_Advisors_on_Science_and_Technology

forensic science experience; 2) PCAST membership disregarded a large body of research, scientific literature, and validations conducted by subject matter experts that counter the claims in its report; and 3) input provided by forensic experts was ignored, misrepresented and misinterpreted. Exhibit 23, p. 2.

At least one prominent forensic DNA scientist submitted a critical position statement in response to the PCAST report, and stated generally: “The report lacks scientific substance. It is cloaked with a veneer of science but in actuality is an attempt to set policy.” Exhibit 28, p. 2. Moreover, he also criticized the PCAST report’s focus on validation as the sole basis for reliability:

The PCAST Report singles out validation as essentially the sole basis for reliability. Instead under a systems approach there are several components that impact an outcome, and the reliance on these several features increases validity and reliability in any one case. Quality performance is an essential component for obtaining reliable results and for reducing the chance of error. Quality assurance provides an infrastructure to promote high performance, address errors that arise, and improve processes. In addition to validation studies, there are other mechanisms such as technical review of a case that reduce error. This technical review is performed within the laboratory before issuing a report and also outside the laboratory when an expert witness is acquired by the opposing side to assess results and interpretations. The PCAST Report seems to ignore the value of these additional quality measures and the strength of the adversary system..... Notably the PCAST Report tends to dismiss experience and judgment, implying it has little value. I agree that experience and judgment standing alone should be considered with caution. However, the vast majority of forensic science disciplines work in a systems approach, i.e., many facets to the process; experience is but one factor among several to effect a quality result.

Id., p. 8.

In 2017, SWGDAM promulgated new guidelines, which are to be applied prospectively and not retroactively. Exhibit 58, p. 2. The guidelines:

are intended to be used for laboratories that will continue to employ binary approaches to interpret electrophoresis-based data. These guidelines may be applicable to probabilistic genotyping, next generation sequencing, and/or rapid DNA technology in a limited capacity, but are not intended for those technologies. It is anticipated that future

documents will address these new technologies and methodologies. These guidelines generally address the interpretation of single-source samples and mixtures of DNA from two people. The basic concepts hold true as they relate to DNA mixtures of three or more contributors, those involving stochastic-level contributors, and with mixtures containing biologically related individuals. However, there are nuances and limitations to binary interpretation of this more complex data which will be addressed.

Id.

Among other things, the guidelines provide that “[i]nterpretation guidelines for mixtures must be based on mixture studies conducted using known contributors that represent the number of contributors and the range of general mixture types for which the procedure will be used in casework...[t]he laboratory guidelines shall be sufficiently detailed to ensure confidence in the separation of the ‘major’ versus ‘minor’ components.” *Id.*, p. 5.

DNA Test Results

Although neither of the DNA Analysts from the BCA testified at the hearings, the reports from both the *Robinson* and *Blackstone* cases were received into evidence and were the subject of substantial testimony from both of the forensic experts called to testify in the case. The analysis of the admissibility of those test results begins with a discussion of the results themselves.

Robinson DNA Test Results

In *Robinson*, the Saint Paul Police Department submitted five DNA samples from the subject weapon for testing by the BCA. The BCA also received known DNA samples from suspect Desean Thomas and Robinson. The items were received and tested by the BCA in September of 2014. All procedures were performed in accordance with the DNA Section’s Standard Operating Procedures (SOP).

The SOPs for DNA analysis at the BCA generally involve the following: 1) a DNA sample is submitted to the BCA, and is logged into its system, placed in a secure vault in the DNA Section and assigned to a DNA Analyst; 2) the DNA Analyst retrieves the DNA sample from the secure vault and performs an extraction to release the contents of the cells which are in the submitted DNA sample; 3) the DNA extraction is then isolated or purified, to separate the DNA from everything else released from the cells; 4) the DNA extraction is then quantified, which involves an estimation of the quantity of the DNA in the extraction; 5) the quantified DNA extraction is normalized to obtain an optimal input amount by either dilution or concentration; and 6) polymerase chain reaction is used to create an amplified product that can be visualized with a genetic analyzer software. At this point, the DNA Analyst can visualize the actual DNA profile and interpret it, and compare it to known reference samples and then calculate statistics if appropriate. Before the DNA report is finalized, it goes through technical review by a second qualified scientist and an administrative review by a lead scientist or supervisor. DNA Analysts follow quality control processes to minimize risks of contamination, etc.

The *Robinson* items were assigned for testing by the DNA Section. They were transferred to a secure vault in the DNA Section, where the assigned scientist retrieved the samples and performed extraction, quantitation, normalization, amplification, analysis and interpretation as outlined above. BCA Analyst McKenzie Anderson tested the DNA samples and performed the analysis of the samples. Anderson is a qualified and proficiency-tested scientist in the DNA Section of the BCA. Anderson prepared a report of the results of her testing and analysis on September 25, 2014. The report was subjected to technical review by a second qualified and proficient DNA scientist from the BCA. Anderson's report was also subjected to

an administrative review by a lead scientist or supervisor for errors. Anderson used the DNA interpretation SOP found in BCA SOP BI-709. The version in place and used by Anderson for the *Robinson* DNA analysis was reviewed and subject to external audit and assessment. There is no dispute that Anderson followed the BCA's interpretation SOP.

Robinson sample number 1 contained swabbing from the grip of the subject firearm. Exhibit 66. Anderson was able to obtain 1400 picograms of DNA from the swabbing. *Id.* Anderson reported that the sample was a mixture of a minimum of four or more individuals. *Id.* The sample was separately compared to known DNA samples from Thomas and Robinson. *Id.* Thomas was excluded from being a contributor. *Id.* Robinson could not be excluded from being a possible contributor. *Id.* With regard to Robinson, Anderson reported: "Three of the 14 loci suitable for comparisons meet the BCA criteria for conducting statistical calculations," and estimated "that 46.3% of the general population can be excluded from being contributors." *Id.* This was characterized by Hoogendoorn, as a very weak statistic.

Robinson sample number 2 contained swabbing from the trigger, hammer and cylinder of the subject firearm. *Id.* Anderson was able to obtain 1500 picograms of DNA from the swabbing. *Id.* Anderson reported that the sample was a mixture of a minimum of three or more individuals. *Id.* The sample was separately compared to known DNA samples from Thomas and Robinson. *Id.* Thomas was excluded from being a contributor. *Id.* Robinson could not be excluded from being a possible contributor. *Id.* With regard to Robinson, Anderson reported: "Four of the 12 loci suitable for comparisons meet the BCA criteria for conducting statistical calculations," and estimated "that 71.2% of the general population can be excluded from being contributors." *Id.* Hoogendoorn characterized this as a weak statistic.

Robinson sample number 3 contained swabbing from the muzzle of the subject firearm. Anderson found insufficient genetic information to generate a DNA profile, so she made no comparisons to either Thomas or Robinson. *Id.* *Robinson* sample numbers 4 and 5 contained swabbings from cartridges and were not tested. *Id.*

Blackstone DNA Test Results

In *Blackstone*, the Saint Paul Police Department submitted six DNA samples from the subject weapon for testing by the BCA. The BCA also received known DNA samples from Blackstone, and suspects D'Shawn Porter, Daesan Gibson, and Destiny Scott. The items were received by the BCA in August of 2015 and tested by the BCA in October of that same year. All procedures were performed in accordance with the DNA Section's SOPs. The items were assigned for testing by the DNA Section. They were transferred to a secure vault in the DNA Section, where the assigned scientist retrieved the samples and performed extraction, quantitation, normalization, amplification, analysis and interpretation as outlined above. BCA Analyst Allison Dolenc tested the DNA samples and performed the analysis of the samples. Dolenc was a qualified and proficiency-tested scientist in the DNA Section of the BCA. Dolenc prepared a report of the results of her testing and analysis on November 12, 2015. The report was subjected to technical review by a second qualified and proficient DNA scientist from the BCA. Dolenc's report was also subjected to an administrative review by a lead scientist or supervisor for errors.

Blackstone sample number 9 contained swabbing from the slide, hammer and levers of the subject firearm. Exhibit 67. Dolenc was able to obtain 2000 picograms of DNA from the swabbing. *Id.* Dolenc reported that the sample was a mixture of a minimum of five or more

individuals. *Id.* The sample was separately compared to known DNA samples from Blackstone and Porter. *Id.* Dolenc identified a major male DNA profile, which matched Blackstone and did not match Porter. *Id.* Dolenc reported that the: “[m]ajor DNA profile would not be expected to occur more than once among unrelated individuals in the world population.” *Id.* Hoogendorn testified that it was appropriate for Dolenc to calculate random match probability, because she identified a major DNA profile. *Id.* Dolenc was unable to make any statement on the minor DNA profiles, due to insufficient genetic information. *Id.* Hoogendoorn testified that it was not possible to know how much each of the minor contributors contributed to the mixture. *Id.* This process, according to Hoogendoorn, followed the DNA Section’s interpretation SOP. Furthermore, Hoogendoorn indicated that Dolenc did not do a mixture interpretation, because a major profile was distinguished within the mixture.

Blackstone sample number 8 contained swabbing from the grip of the subject firearm. *Id.* Dolenc was able to obtain 880 picograms of DNA from the swabbing. *Id.* Dolenc reported that the sample was a mixture of a minimum of four or more individuals. *Id.* She further reported that “[t]he DNA mixture is not suitable for comparisons because no loci meet the BCA criteria for conducting statistical calculations.” *Id.*

Samples 10, 11, 12 and 13 were not examined. *Id.* Although DNA profiling was initiated on the known DNA samples from Gibson and Scott, they were not completed.

The Expert Witnesses and their Opinions

As previously stated, the State presented the testimony of Hoogendoorn and the Defendants presented the testimony of Rudin, both qualified experts in the field of forensic DNA analysis.

Marlijn Hoogendoorn, PhD

Hoogendoorn has been employed by the BCA since 2005 and has been the Technical Leader of the DNA Section since 2012. She is a forensic scientist within the BCA, has a PhD in Entomology, and is specifically trained in DNA casework. As Technical Leader of the DNA Section, Hoogendoorn oversees the technical operations of the lab, including updating procedures, approving validations, overseeing proficiency testing, and participating in reviewing and approving other scientists' qualifications. Despite her leadership position in the DNA section, she remains a qualified and proficiency-tested bench scientist for DNA casework.

In addition to her position at the BCA, Hoogendoorn is also a technical lab assessor with ASCLD/LAB. In that position, she takes part in assessments of accredited labs across the country. Hoogendoorn is also an FBI QAS auditor and has conducted seven external audits in that capacity on other labs. She is an audit review panel member with the NDIS and has done approximately five audit reviews. In that position, she takes part in the review of any findings or corrective actions that are appealed as the result of lab audits under the QAS.

Hoogendoorn testified that the BCA is an accredited and audited lab and at all times compliant with the FBI QAS, ASCLD/LAB Board Interpretations and SWGDAM guidelines. She contended that the validations done by the BCA were adequate to create and support the SOPs used by the BCA's DNA Analysts to interpret complex DNA mixtures. The validation studies evaluated, among other things: total DNA input; minor to major ratio; possible degradation; possible inhibition; extraction methods, quantification methods, MDT, MIT and the like. Hoogendoorn testified that the validations of two- and three-person mixtures applied to the

interpretation of four- and five-person mixtures. She contended that the methods used by the BCA are commonly used throughout the country and are foundationally reliable.

Hoogendoorn testified that the DNA Analysts who performed the interpretations in both *Blackstone* and *Robinson* were qualified, adequately trained and competency and proficiency tested forensic DNA scientists. Their analysis followed the SOPs, on calibrated and validated instruments. Their reports were subject to technical review by a second qualified forensic DNA scientist, who agreed with their conclusions. Their reports were also subject to a less rigorous administrative review by a lead scientist or supervisor in the DNA Section. Hoogendoorn testified that the methods used by the DNA Analysts were consistent with FBI QAS requirements and SWGDAM guidelines.

Norah Rudin, PhD

Rudin has been a forensic DNA consultant since 1991. She has a PhD in Biology. Rudin helped develop the DNA program for the California Department of Justice, where she organized and implemented validation studies, developed and wrote protocols. She also assisted other governmental agencies in California and Idaho with their DNA program development. Rudin consults for private and government labs and attorneys. Although Rudin does not have a lab, she has the capacity to interpret data run from other labs. She has written and presented on various issues concerning forensic DNA analysis. She and colleagues have worked to create Lab Retriever, an open-source software program for performing probabilistic genotyping.

Rudin contends that the methods used by the BCA, like other DNA labs, do not support reliable or consistent interpretation of complex mixtures. She points to several DNA lab scandals across the country, the reaction of ASCLD/LAB expressing concerns regarding DNA

mixture interpretation, the PCAST report's conclusions regarding problems with complex mixture interpretations and the opinions of other forensic DNA scientists such as John Butler, to underscore this opinion.

Rudin testified that the validation studies conducted by the BCA, which were the basis for the SOPs followed by the BCA here, do not support the casework done in these cases. She is of the opinion that the validations are insufficient, did not mimic casework samples, were disorganized and did not ask the right questions. She contends that validation studies of two- and three-person mixtures fail to account for the complexity or conditions of four- to five-person mixtures and are therefore unreliable. While acknowledging that the BCA did some studies using four- and five-person mixtures, Rudin contends that the BCA did not use data from those studies to create meaningful interpretation guidelines. She is of the opinion that the BCA is not in compliance with the ASCLD/LAB interpretation guidelines, because its laboratory interpretation guidelines are vague and conditional. The problem with such vague and conditional laboratory interpretation guidelines, in Rudin's assessment, is that they do not provide enough guidance to ensure that analysts from outside the BCA would understand its procedures and would be able to reach the same conclusion as DNA Analysts from the BCA.

With regard to the *Robinson* DNA profiles, Rudin testified that the CPE statistics rendered for them were not appropriate because the BCA had not done extensive validation, including on four- and five-person mixtures, prior to interpretation.

With regard to the *Blackstone* DNA profile, Rudin described it as very complex. While she agreed that one explanation for the profile was calling Blackstone as a major contributor, that

was not the only explanation for the profile. She also said that the profile did not lend itself to random match probability.

Standard for Admissibility of Expert Testimony

“Like all testimony, expert testimony must satisfy the basic requirements of the rules of evidence.” *Doe v. Archdiocese of St. Paul*, 817 N.W.2d 150, 164 (Minn. 2012). Expert testimony is not admissible if it is irrelevant. Minn. R. Evid. 402. Evidence is irrelevant if it lacks “any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence.” Minn. R. Evid. 401; *State v. Hurd*, 763 N.W.2d 17, 30 (Minn. 2009). Relevant evidence, however, may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury. Minn. R. Evid. 403; *State v. Anderson*, 789 N.W.2d 227, 235 (Minn. 2010).

In addition to these basic requirements, expert testimony is inadmissible unless it satisfies the requirements of Minn. R. Evid. 702, which provides:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise. *The opinion must have foundational reliability.* In addition, if the opinion or evidence involves novel scientific theory, the proponent must establish that the underlying scientific evidence is generally accepted in the relevant scientific community.

Doe, 817 N.W.2d at 164 (quoting Minn. R. Evid. 702)(emphasis added). “[E]xpert testimony is only admissible under Minn. R. Evid. 702 if the proponent shows that the testimony passes a four-part test: (1) The witness must qualify as an expert; (2) the expert's opinion must have foundational reliability; (3) the expert testimony must be helpful to the trier of fact; and (4) if the

testimony involves a novel scientific theory, it must satisfy the *Frye–Mack* standard. *Doe*, 817 N.W.2d at 164 (quoted source omitted).

“Under Rule 702’s current four-part test, courts may be required to consider foundational reliability in two contexts. First, all experts’ opinions must have foundational reliability before they can be admitted. Minn. R. Evid. 702. Second, if the *Frye–Mack* standard applies, the particular scientific evidence in each case must be shown to have foundational reliability, which requires the proponent of a test to establish that the test itself is reliable and that its administration in the particular instance conformed to the procedure necessary to ensure reliability. Rule 702 does not define, generally, what foundational reliability means.” *Doe*, 817 N.W.2d at 165 (quoted sources, internal edits and quotations omitted). “But, at a minimum, foundational reliability must require that the theory forming the basis for the expert’s opinion or test is reliable.” *Id.* at 166.

The *Frye–Mack* standard is comprised of two prongs, the first based on *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923) and the second on *State v. Mack*, 292 N.W.2d 764 (Minn. 1980). “Under *Frye*, the proponent of novel scientific evidence is required to show that the scientific principle or test about which an expert is to testify is generally accepted within the relevant scientific community. Under *Mack*, the proponent of particular evidence derived from the application of the scientific principle or test must establish that the test itself is reliable and that its administration in the particular instance conformed to the procedure necessary to ensure reliability. The trial court determines whether the *Frye–Mack* standard has been satisfied by means of a pretrial hearing. When the scientific technique that produces the evidence is no longer novel or emerging, then the pretrial hearing should focus on the second prong of the *Frye–*

Mack standard.” *State v. Dixon*, 822 N.W.2d 664, 671 (Minn. Ct. App. 2012)(internal quotations and quoted sources omitted).

Legal Analysis

Under *Doe*, the test for admissibility of expert opinions under Minn. R. Evid. 702 is that the expert must be qualified, the opinions of the expert must have foundational reliability, the opinions must be helpful to the trier of fact and must satisfy the *Frye-Mack* standard if the expert’s testimony involves a novel scientific theory.

Here, the Defendants do not question that the State’s experts, Hoogendoorn, Anderson or Dolenc are qualified experts in the area of forensic DNA testing, analysis and interpretation. The Defendants have also not suggested that opinions concerning the testing, analysis, interpretation and results of the DNA testing done in both cases, if reliable, would be helpful to the trier of fact. Defendants’ contentions are focused therefore, on the reliability of the BCA’s method of analysis and interpretation of complex DNA mixtures and their general acceptance in the scientific community under the *Frye-Mack* standard.

Frye-Mack Admissibility

Although the bulk of the Defendants’ concerns deal with reliability and are therefore more properly aligned with the *Mack* prong of the *Frye-Mack* standard, Defendants also contend that the DNA mixture interpretation evidence does not pass the *Frye* prong of the standard. Defendants contend that “[t]here is simply no general acceptance in the scientific community for how to interpret complex DNA mixtures.” Defendants point out that the interpretation of complex mixtures varies greatly from lab to lab. Defendants use the MIX13 study as an example of interlaboratory variation in interpreting and weighting complex DNA mixtures. *See Exhibits*

71 and 72.³ According to Rudin, the study is “empirical proof of the concerns that the forensic community had been talking about for the past ten years about complex mixture interpretation.”

The problem with this argument, however, is that Defendants have simply ignored the *Frye* threshold; namely, that the expert testimony must involve a “novel scientific theory.” *Doe*, 817 N.W.2d at 164. There is no novel science here. In fact, the gist of the testimony and the back and forth of the scientific papers, commentary and other exhibits in this matter, demonstrate that the increased sensitivity of detection due to improvements in technology is enabling the analysis of more challenging and complex mixtures. The difficulty is that traditional methods and protocols for interpretation of these complex samples have presented challenges for forensic DNA scientists. The fact that there may be a debate between Hoogendoorn and Rudin, or Bieber and Butler, or PCAST and Budowle, may suggest a controversy over how complex mixtures should best be interpreted and weighted, but does not demonstrate that there is novel science at issue. The fact that there may be a wide range of variation within and between other laboratories regarding complex mixtures and that there have been problems with certain forensic DNA labs in other states, may shed light on reliability, but not whether interpreting complex DNA mixtures is novel science. *See, e.g.*, Exhibit 57, p. 4 (“The application of existing technology to the analysis of forensic samples does not necessarily create a new technology or methodology.”). It appears that there is general agreement that interpretation of complex mixtures, using binary methods of interpretation and using CPI/CPE is possible and acceptable, if done in an accredited lab, by an appropriately trained, competent and proficient forensic DNA scientist, according to validated protocols or SOPs that are consistent with FBI QAS/SWIGDAM guidelines. Any controversy

³ The study was not submitted into evidence; however, Defendants introduced two presentations on the results of the study.

identified by Defendants goes to reliability, as will be discussed in detail below, not novel science.

Foundational Reliability

Accreditation and Compliance with Standards and Guidelines

There was considerable testimony and evidence submitted in these cases regarding the FBI QAS, SWGDAM guidelines, ASCLD/LAB and the auditing and accreditation process. There is no question that the BCA has been, at all relevant times, accredited by ASCLD/LAB and is in compliance with the FBI QAS. There is also no question that the BCA has met all internal and external audits and surveillance studies. Rudin contends, however, that the audits and accreditations themselves are capricious. She holds out the fact that accredited labs have been the subject of scandal and have had difficulty interpreting complex DNA mixtures for a variety of reasons, as support for her opinion.

Rudin also calls into question whether the BCA is really in compliance, despite imprimaturs of compliance by various interested organizations, with relevant standards and guidelines for the interpretation of complex mixtures. By way of example, Rudin focuses on the results of the external ASCLD/LAB audit in 2014, which found initially that the DNA Section was not in compliance with QAS standard 8.3.2. The findings indicated: “The laboratory has validated standard DNA methods using 2 and 3 person mixtures. DNA personnel are interpreting and reporting mixtures of 4 or more people. The validation is not as extensive as necessary to meet the needs of the application.” Exhibit 13 (141015), p. 91. Though Rudin agrees with this initial finding, the fact that it was made during an audit undercuts Rudin’s criticism of capriciousness. The auditing and accreditation processes, from all of the evidence

available in this case, show that the BCA is subject to rigorous outside scrutiny, rather than a rubber stamp by unqualified, self-interested assessors. Moreover, and important in this case, the initial finding was overturned after the BCA appealed the finding to the FBI National DNA Index System (NDIS) Audit Review Panel. This process provided another level of scrutiny and review, and forced the BCA to satisfy the audit review panel that the initial finding was not supported and that its validated methods and interpretations of complex DNA mixtures were in compliance. The BCA was successful in its appeal and the initial finding was overturned. The auditing and accreditation process reinforces, rather than undermines, the reliability of the BCA's analysis and interpretation of complex DNA mixtures.

Validation

Rudin is critical of the validation work that the BCA has done at various stages to support its interpretation of complex DNA mixtures. She contends that the validation studies were disorganized, did not “ask the right questions,” did not reflect actual casework, and were insufficient in number and complexity. SWGDAM defines validation as “a process by which a procedure is evaluated to determine its efficacy and reliability for forensic casework and/or database analysis.” Exhibit 57, p. 3. The crux of Rudin's criticism of the BCA's validation studies appears to be in its internal validation, which according to SWGDAM “is an accumulation of test data within the laboratory to demonstrate that established methods and procedures perform as expected in the laboratory. Prior to using a procedure for forensic applications, a laboratory shall conduct internal validation studies...[which] should be sufficiently documented and summarized.” Exhibit 57, p. 4. Guideline 2.2.2.2 provides that: “[q]uality assurance parameters and interpretation guidelines shall be derived from internal validation studies. For example, lower template DNA may cause extreme heterozygote

imbalance; as such, empirical heterozygote peak-height ratio data could be used to formulate mixture interpretation guidelines and determine the appropriate ratio by which two peaks are determined to be heterozygotes. In addition to establishing an analytical threshold, results from sensitivity studies could be used to determine the extent and parameters of quality control tests that reagents require prior to their being used in actual casework.” Exhibit 57, p. 5.

As Hoogendoorn testified, the BCA has done internal validations on the Identifiler kit and its adjacent analyzers, in 2004, 2007 and 2014. It also gained nearly a decade of experience in analyzing mixtures with the Identifiler kit. Through the validations, consisting of sensitivity studies, evaluation of stochastic effects, 2- and 3-person mixture studies, the BCA was able to determine, among other things as required by SWGDAM, minimum interpretation thresholds, stochastic thresholds, and peak height ratios. Two documents provide the most comprehensive summaries of the internal validation work by the BCA and why such validations support the lab’s interpretation protocols. The first is the appeal from the external 2014 audit’s initial finding concerning the sufficiency of the BCA’s validated methods for DNA testing. Exhibit 14. The initial finding was that the BCA’s mixture interpretation methods were not supported by validation extensive enough to meet the needs of interpreting and reporting mixtures of four or more people. *Id.* at p. 1. Rudin agrees with the initial finding, which essentially encapsulates her overall assessment of the insufficiency of the validation studies.

Hoogendoorn authored the appeal of the initial findings, which included the following response:

Various two-and three person mixtures in different ratios were analyzed as part of the internal validation studies for the Identifiler kit, in addition to extensive sensitivity studies and limit of detection studies to determine a minimum detection threshold and a stochastic threshold for data interpretation. In our validation studies we also evaluated

other factors such as total DNA input, minor to major ratio, possible degradation, or possible inhibition, since these factors can have an effect on the interpretation of mixtures which may be greater than considering simply the number of contributors. The studies performed by the BCA Laboratory are typical of what is done by many Forensic DNA laboratories and sufficiently support the mixture interpretation and statistical calculation procedures in place at the BCA Laboratory. In addition to our validation data, we also have used our experience over time to fine-tune our interpretation of mixtures, such as increasing our DNA input for certain sample types.

* * *

In the ten years since our initial validation of Identifiler, we have conducted several more validation studies that support the findings from our initial validation of this kit. Our protocols for interpretation of mixtures have evolved as our Laboratory started accepting more “touch DNA” –like items and started encountering more complex mixtures. As part of their training, scientists at the BCA Laboratory analyze adjudicated cases across the spectrum of what is typically submitted to our laboratory, including cases involving mixtures of DNA from four and five contributors. In addition, scientists are also trained on how to explain the results of our testing in court. This includes explaining all the complexities of mixture interpretation, including statistical analysis, allele sharing, stochastic effects, and the possibility of drop-out.

* * *

The BCA Laboratory is not using non-standard methods or applying standard methods outside of their intended scope. Our validations sufficiently support our interpretation of mixtures and our use of CPE for statistical calculations for all mixtures. Since the original validation, we have gained more than nine years of experience in analyzing mixtures with the Identifiler kit, and scientists from the BCA Laboratory have testified to our analysis results in court for thousands of cases involving mixtures.

* * *

The BCA Laboratory has and follows Standard Operating Procedures and has validated its methods for conducting mixture analysis. We are in compliance with QAS Standard 8.3.2 because our interpretation guidelines are based directly on our internal validations. Furthermore, there is currently no consensus in the Forensic DNA community on what constitutes the “best” method of mixture analysis, including statistical calculations. Recently there have been a number of workshops and publications addressing DNA mixture interpretation, and there is a lot of debate on this topic among practitioners. Presenting the point of view from one practitioner without acknowledging the debate on this topic is greatly misrepresenting the scientific discourse currently ongoing on this topic.

Exhibit 14, pp. 1-3.

As indicated above, the NDIS Audit Review Panel of the FBI accepted the explanation provided by the BCA and overturned the initial audit finding and determined that the BCA was “in compliance with external audit requirements and the FBI Director’s Quality Assurance Standards.” Exhibit 15. The reasonable conclusion to be drawn, therefore, is that the BCA’s mixture interpretation methods were supported by validation extensive enough to meet the needs of interpreting and reporting mixtures of four or more people.

The second summary offered by the BCA of its internal validation work and why such validations support the lab’s interpretation protocols was authored by Hoogendoorn in February of 2016, in response to the 2015 ASCLD/LAB position statement and its clarifying supplement. Exhibit 19. Much of the summary is identical or similar to the NDIS Audit Review Panel appeal, but also includes the results of the performance check done by the BCA to verify its current DNA mixture protocol performance. Exhibit 9, p. 2. During the performance check, the BCA had six of its qualified forensic DNA scientists (though with varying levels of experience) interpret the same four complex mixtures, which were created as part of an ongoing validation study for new amplification kits. Exhibit 19, p. 3. The scientists were instructed to use current interpretation guidelines. *Id.* The input amounts of DNA were typical to what would be expected for casework samples with complex mixtures. *Id.* The scientists interpreted three samples with four contributors and one sample with five contributors. *Id.* The results of their analysis were then evaluated for consistency and to determine whether their known contributor profiles would be excluded. *Id.* The summary concluded: “All six scientists reported the same interpretation of all mixtures.”

The performance check was done in response to ASCLD/LAB’s directive to labs to ensure that “the *current* DNA mixture protocol in use in your lab, the one you’ve already

validated and the protocol your analysts have been and are using, is effective and producing accurate and reliable results for the number of mixture contributors being reported by analysts in your laboratory.” Exhibit 9, p. 1 (emphasis in original). The BCA’s performance check, shows several things. First, it demonstrates that it is responsive and timely to the guidance provided by its accrediting body. Second, it demonstrates that ASCLD/LAB had a current protocol, which was based on validation studies, which scientists of varying levels of experience could understand and apply. Third, it demonstrates that the BCA was in the process of validating even more complex 4- and 5-person mixtures (which were completed later in 2016). And finally, that six qualified scientists of varying degrees of experience, could reach the same interpretation. This performance check undercuts Rudin’s assessment and criticism of the BCA’s validation studies. The performance check demonstrates that the validations and the protocols based on them, produce accurate and reliable results in the interpretation of complex mixtures.

Rudin is also critical of the BCA’s conclusions from the validation studies, which provide the basis for interpretation protocols for complex mixtures. Rudin’s criticism is that they are too vague, too conditional, don’t account for the number of contributors to the mixture, and therefore fail to provide guidelines which produce consistent, reliable results. The thrust of the Defendants’ contentions in this regard are that the conclusions are insufficient “to enable different analysts in the same laboratory to reach the same conclusion; and a competent person from outside the laboratory using the same procedure to understand how the conclusion was reached.” Exhibit 8, p. 3. As indicated above, the performance check demonstrates that the protocols developed in the BCA for complex mixture interpretation allowed different analysts in the same lab to reach the same results. Moreover, as indicated above, the outside audits by ASCLD/LAB over the course of time, including the expanded site visit in 2016, which examined

quality control records, case files, and the performance check completed earlier that year, found that the BCA was in compliance. If there was concern about the validation study conclusions, or the complex mixture interpretation protocols, presumably the qualified scientists from the other labs or governmental organizations who participated in the audits, appeals or site visits, would have flagged such concerns.⁴

Complex Mixture Interpretation in Robinson and Blackstone

Defendants also advance several arguments that are unique to their cases. *Robinson* highlighted the BCA's continued use of CPE (the proportion of a given population that would be expected to be excluded as a potential contributor to an observed DNA mixture), to complex mixtures. He contends that CPE "is becoming outdated and has serious limitations when it comes to interpreting complex mixtures." Rudin contends that CPE cannot be used when dropout occurs, because individuals who might have DNA in the evidentiary sample may be erroneously excluded, which may inflate the statistic. Rudin agrees that CPI/CPE is still a good statistic if applied correctly. She contends, however, that the BCA is "incautious" and is "over-interpreting" its samples. She states that the BCA is applying CPI/CPE on DNA samples "for which perhaps it is not the best kind of statistic." Basically, Rudin contends that if a lab is going to continue to use CPI/CPE, it must develop a stochastic threshold to account for dropout. Her contention is that the BCA has not created a valid stochastic threshold, because she could not determine its basis and because she contends that Hoogendoorn never established how to apply it appropriately.

⁴ Obviously, the 2014 ASCLD/LAB audit flagged a concern; however, it was appealed and overturned.

CPI/CPE is the most commonly used method in most of the world to assign the weight of evidence where a probative profile is obtained from an evidentiary sample. Many labs, including the BCA, continue to use the CPI/CPE based approaches. Exhibit 2, p. 3. Noted scientists have advocated a protocol, to guide practitioners in the continued use of CPI/CPE based approaches. *Id.* The continued use of CPI/CPE method is dependent upon a detailed DNA mixture protocol, and upon valid MDT, MIT, and other values and ratios. Exhibit 2, pp. 4, 12. Also, according to one published paper, “it is essential that application of the CPI be performed by well-trained professionals using their judgement and knowledge...their professional education, and relevant experience.” *Id.* Interpretation “requires human processing and experience with the nuances of interpreting evidentiary and reference profiles.” Exhibit 3, p. 1. “As much as it is the responsibility of the forensic scientist to not overstate the significance of a test result, an equally important tasking is that an analyst should not ignore defensible conclusion in a mistaken effort to be ‘conservative.’ Conclusions so ‘conservative’ that they strip away supportable elements of their meaning (i.e., grossly understate) are effectively rendered inaccurate and are no less unsuitable for reporting than an inaccurate over-statement of a conclusion.” Exhibit 3, p. 12.

The crux of the dispute in this regard, is Rudin’s contention that the stochastic threshold used by the BCA is not appropriate for the complex mixtures being interpreted by it, and Hoogendoorn says it is. Hoogendoorn summarized the perspective of the BCA as follows:

The BCA Laboratory conducts statistical analyses, using the Combined Probability of Exclusion (CPE) for mixtures. This statistical method does not make an assumption on the number of contributors to the mixture. It simply considers which alleles are present and the frequencies of these alleles. In the CODIS PopStats program, which is widely used by DNA laboratories to calculate statistics in forensic DNA, up to 8 alleles per locus can be entered for statistical calculations for mixtures. Because the method of CPE does not make an assumption to the number of contributors in a mixture, and a definitive number of contributors cannot be ascertained from a mixture, validation of the method with two and three person mixtures, in addition to sensitivity studies, is sufficient for the

purposes of this method. In general, it is not feasible to address every possible scenario or sample type in every validation. The purpose of validations is to establish reasonable criteria under which DNA analysis can be performed.

She also echoes, what appears that many scientists recognize, which is that experience matters:

And I should note that [the stochastic threshold] is not just applied blindly, so if there is a locus that has much fewer peaks than you would expect to see in a mixture of that complexity, or if there [are] signs of degradation at that locus even if the peaks that are there are above stochastic threshold, the scientist may still choose to exclude it from analysis or comparison.

Trans., p. 166-167. *See also* Exhibit 2, p. 4, 12 (well-trained professionals must apply CPI using their education, training, judgment and knowledge) and Exhibit 3, p. 1 (interpretation “requires human processing and experience with the nuances of interpreting evidentiary and reference profiles.”).

Rudin contends that the BCA is incautious in its use of CPE and risks overstating the significance of a test result. It is not clear, however, why the stochastic threshold set by the BCA and applied in the *Robinson* case overstates the significance of the test results. The results were interpreted by an experienced forensic DNA Analyst, using her experience, training, judgment and knowledge. The results in *Robinson* are admittedly weak, so it is rather difficult to understand why they risk overstatement. As Budowle concluded: “As much as it is the responsibility of the forensic scientist to not overstate the significance of a test result, an equally important tasking is that an analyst should not ignore defensible conclusion in a mistaken effort to be ‘conservative.’” Exhibit 3, p. 12.

Blackstone contends that the mixture interpretation done in his case and calling a major DNA profile was unreliable. He contends that the method of interpretation is contrary to 2017 SWGDAM interpretation guidelines; however, those guidelines are explicitly not retroactive and

do not apply to his case. In any event, the focus of Rudin’s criticism appears to be on two allelic peaks that the BCA Analyst called as a major profile, matching Blackstone’s profile. Rudin says: “[e]ven though it is very tempting to say those two large peaks can be obligately paired as coming from the same person and that profile is, the whole profile, is from a single person, given the number of possible contributors, I think that is unsafe. It is certainly one possibility but it is not the only possibility...” Trans., pp. 502-503.

The problem with this contention, however, is that the DNA Analyst used 14 of 15 loci, not two, to distinguish a major profile. She was also trained to recognize stacking and allelic dropout. As Hoogendoorn testified with regard to the possibility raised by Rudin: “Well, we don’t just look at peak heights; we look at the ratios across the whole profile. So it would be very unlikely that you get peak heights and peak-height ratios that are consistent with a single contributor across the whole profile and then at one locus, all of the sudden, you have two different homozygous contributors that are that tall. So I would say that that is highly unlikely.” Trans., p. 361. Accordingly, despite the fact that it might be possible that there are other explanations for the peak heights interpreted by the DNA Analyst, it appears highly unlikely. In the end, the evidence submitted in the *Blackstone* case does not support a contention that calling a major DNA profile was either “dangerous” or “unsafe.”

Experts in the Broader Forensic DNA Community

The parties also engaged in a battle over which authoritative expert or group should direct the inquiry regarding the efficacy and reliability of the interpretation of complex DNA mixtures. On the one hand, Defendants offer John Butler (“basically *the* authority on DNA testing) and PCAST. On the other hand, the State offers Frederick Bieber and Bruce Budowle and those

individuals and entities which objected to the PCAST report. In the end, however, this court does not have to pick one side (to the extent that there is a definitive side) or the other. There appears to be agreement, among those qualified to weigh in, including the testifying experts in this case that: 1) technological advances in detecting DNA have created more complex DNA mixtures; 2) interpretation of evidence samples containing mixed DNA profiles is more complicated and challenging than the analysis of single source samples; 3) binary methods of interpretation have limitations; 4) the trend is toward methods of probabilistic genotyping; 5) it is incumbent upon laboratories conducting forensic casework to validate their instruments and methods, in a well-defined and reproducible way, and consistent with FBI QAS and SWGDAM guidelines; 6) interpretation and analysis of complex DNA mixtures must be done by trained, qualified and proficient scientists; and 7) CPI/CPE remains a viable and commonly used method to assign the weight of evidence from a probative DNA profile obtained from an evidentiary sample.

Although Defendants contend that Butler has concluded that: “complex mixture interpretation does not produce reliable, consistent, and accurate results.” This court has been unable to find such a conclusion in Exhibit 62, or any other document authored by him. Butler notes the challenges presented by complex DNA mixtures and is of the opinion that they: “offer one of the largest challenges for the future of forensic DNA analysis.” Exhibit 62, p. 6. He also observes that: “[p]robabilistic genotyping offers a way to strengthen conclusions with challenging DNA mixture results that might otherwise be declared inconclusive under a binary approach to interpretation.” *Id.* at 6-7. As indicated above, neither of these concepts is disputed. While the trend is toward probabilistic genotyping, binary approaches to interpretation of

complex mixtures are still valid and accepted methods, if properly validated and done by qualified scientists in accredited labs.

While there are obviously differences in opinions between forensic DNA scientists, they also endorse each other's work. For example, Butler was a co-author with Bieber, Budowle and others in an article regarding the evaluation of DNA mixture evidence and using CPI/CPE. Exhibit 2. The abstract's conclusion is: "Guidance and details of a DNA mixture interpretation protocol is provided for application of the CPI/CPE method in the analysis of more complex forensic DNA mixtures. This description, in turn, should help reduce the variability of interpretation with application of this methodology and thereby improve the quality of DNA mixture interpretation throughout the forensic community." *Id.* at 1. This reinforces the concept that, under appropriate protocols and implementation, interpretation of complex DNA mixtures and weighing with CPI/CPE can be done appropriately and reliably. This does not support the argument of Defendants that "there is no reliable, consistent, or accurate method for interpreting complex DNA mixtures."

The PCAST report found that: "DNA analysis of complex mixtures based on CPI-based approaches has been inadequately specified, subjective method that has the potential to lead to erroneous results. As such, it is not foundationally valid." Exhibit 61A, p. 82. While this is a strong pronouncement, PCAST qualified this finding, apparently because it had not had the time to assess the Bieber, *et al.* article which might have impacted its finding, and allowed: "If, for a limited time, courts choose to admit results based on the application of CPI, validity as applied would require that, at a minimum, they be consistent with the rules specified in the paper." *Id.* See also Exhibits 2 and 61B, p. 8. Accordingly, by its own exception, PCAST allowed for the admission of results based on CPI/CPE "for a limited time" under certain circumstances. Such a

finding, even with the exception, is not particularly persuasive or helpful here. The PCAST report has drawn substantial criticism from a variety of stakeholders. *See, e.g.*, Exhibits 27-28. PCAST is no longer in existence, which may be the result of political and not scientific considerations. Even if it was still around, without more definitive and substantiated guidance, it does not seem to carry the weight or value advocated by Defendants.

In the end, this court is satisfied, that the BCA is an audited and accredited lab, with experienced, trained, proficient and qualified scientists, who conducted interpretation of complex DNA mixtures in the *Robinson* and *Blackstone* cases, based upon validated protocols, and reliable results.

403 Balancing Test

Both Robinson and Blackstone contend that the anticipated expert opinions of the DNA Analysts in their respective cases should be excluded because their testimony is irrelevant and even if relevant, the probative value of the opinions is outweighed by the potential for unfair prejudice.

Robinson anticipates that Anderson would testify at trial that, for sample 1 Robinson could not be excluded from being a contributor to the mixture, but 46.3% of the population could be excluded and that, for sample 2 Robinson could not be excluded from being a contributor to the mixture, but 71.2% of the general population could be excluded. He contends that “DNA evidence does not have significant probative value unless the percentage of the population excluded from the sample is large enough to allow the factfinder to reliably conclude that the suspect’s DNA is in the sample.” Because the statistics with regard to both samples have been described as “weak” associations, Robinson contends further that the statistics are irrelevant and

outweighed by the danger of unfair prejudice. Robinson also argues that the statistics are also unfairly prejudicial because once a jury hears “the word ‘DNA,’ they stop listening and assign unfounded weight to that evidence,” despite the fact that the statistic has low or no probative value.

Blackstone anticipates that Dolenc would testify at trial that his DNA profile matches the major profile taken from the sample on the seized weapon and that the profile would not be expected to occur more than once in the world population. As such, Blackstone contends that the testimony of Dolenc should not be admitted under Minn. R. Evid. 403 because it “wildly inflates the probative value of the evidence in this case,” it “is a gross mischaracterization of the evidence as it should have been interpreted,” and because of the inherent power of DNA evidence.

Minn. R. Evid. 401 defines relevant evidence as “evidence having *any tendency* to make the existence of *any fact* that is of consequence to the determination of the action *more probable or less probable* than it would be without the evidence.” (emphasis added). *See also State v. Carlson*, 268 N.W.2d 553, 559 (Minn. 1978)(evidence is relevant if it “in some degree advances the inquiry”).

The central issue in these matters is whether the Defendants knowingly possessed a firearm. The samples taken from the firearm tested in the *Robinson* case have a weak association to Robinson’s DNA profile and contain DNA from a minimum of three people. Nonetheless, the samples have at least some tendency to make Robinson’s knowing possession of the subject firearm more probable than it would be without the DNA evidence. The sample taken from the firearm tested in the *Blackstone* case shows that Blackstone’s DNA profile is the most significant

among at least five others. Again, the sample has at least some tendency to make Blackstone's knowing possession of the subject firearm more probable than it would be without the DNA evidence.

Relevant evidence “may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice.” Minn. R. Evid. 403. “[T]he application of Rule 403 must be cautious and sparing...It is not designed to permit the court to ‘even out’ the weight of the evidence, to mitigate a crime, or to make a contest where there is little or none.” *U.S. v. McCrae*, 593 F.2d 700, 707 (5th Cir. 1979). It is not proper for the judge, under the guise of enforcing Rule 403 to engage in “damage control” by excluding evidence harmful to a party's case, because such “damage,” if fairly inflicted, is the point of effective advocacy. *See State v. Ferguson*, 581 N.W.2d 824, 834 (Minn. 1998).

Without question, DNA evidence is frequently referenced in popular culture and news commentary and typically presented in such a way that it is seen as unassailable proof of either guilt or innocence. However, as the testimony in the four day hearing held in this case reveals, context is critical. The association between the Robinson DNA profile and the samples taken from the subject firearm is admittedly weak. Sample 1 revealed that 53.7 % of the population cannot not be excluded from being possible contributors. In other words, more people are included as potential contributors to the DNA mixture than excluded. Sample 2 revealed that almost 30 % of the population that would be included as potential contributors to the DNA mixture. The results in *Blackstone* revealed that his DNA profile was a match to the major DNA profile in sample 9, among a mixture of a minimum of five or more people. The DNA evidence in both *Robinson* and *Blackstone* is certainly not dispositive. In context, and especially in light of the anticipated rigorous and informed cross-examination from experienced defense counsel

and expert testimony from Rudin, there is a very low risk of unfair prejudice. The probative value of the DNA evidence in these cases is not substantially outweighed by the danger of unfair prejudice.

Since this court has already made the determination that the DNA interpretation in both cases has foundational reliability and is helpful and therefore relevant, no further discussion is necessary regarding Defendants' Rule 401 arguments.

For all of these reasons, Defendants' motions to exclude DNA evidence as lacking foundational reliability, the product of a scientific method not generally accepted under *Frye-Mack*, and inadmissible pursuant to Minn. R. Evid. 403 are denied. A status conference in both cases shall be set for June 6, 2018 at 1:30 p.m. at the Ramsey County Courthouse, 15 Kellogg Blvd. W., St. Paul, MN 55012.

TAG

FW: Agenda book materials

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Wed, 03 Oct 2018 16:49:13 -0400
Attachment agenda fall 2018 doc (17.46 kB); memo to committee on roundtable discussion fall 2018 doc (28.53 kB); minutes spring 2018 meeting.docx (75.53 kB); Report of Rule 702 subcommittee to the Advisory Committee.docx (29.25 kB); memo to subcommittee on forensics and overstatement September 2018.docx (139.74 kB); Memorandum to Rule 702 subcommittee on admissibility and weight.docx (55.12 kB)

Hi Ted,

Attached are the FRE meeting materials on forensics.

Thank ,
Kira

ADVISORY COMMITTEE ON EVIDENCE RULES

AGENDA FOR COMMITTEE MEETING

Denver, Colorado

October 19, 2018

I. Roundtable Discussion on Agenda Items

The Committee has invited nine distinguished guests to a roundtable discussion with Committee members on the Committee's current agenda items: 1) Rule 702 and forensic evidence; 2) Rule 702 on emphasizing that sufficiency of basis and reliability of methodology are questions for the court under Rule 104(a); 3) Rule 106; and (time permitting) 4) a new agenda item regarding Rule 615. This roundtable discussion will take place before the formal Committee meeting. The Committee will then discuss the agenda items at the meeting in light of the roundtable discussion. A background memo regarding the roundtable discussion, with bios for the participants, is included behind Tab 1.

II. Committee Meeting --- Opening Business

Opening business includes:

- Approval of the minutes of the Spring, 2018 meeting.
- Report on the June, 2018 meeting of the Standing Committee.
- Welcome to new member Kathy Nester.

III. Rule 702

Judge Livingston has established a Subcommittee to research and consider two issues regarding Rule 702: 1) How and whether the Committee should address recent challenges to forensic expert testimony, as discussed in the reports by PCAST and the National Academy of Sciences; and 2) Whether Rule 702 should be amended to specify that the admissibility requirements set forth in the rule (most especially sufficiency of basis and reliability of application) are matters that must be decided by the court a preponderance of the evidence under Rule 104(a).

The Subcommittee has been reviewing a number of changes and suggestions. Judge

Schroeder, the Chair of the Rule 702 Subcommittee, has submitted a report on the Subcommittee's progress. That report is included behind Tab III. The Reporter's memos regarding each of the Rule 702 questions are appended to Judge Schroeder's report.

IV. Rule 106

Judge Paul Grimm has asked the Committee to consider a proposal to amend Rule 106, the rule of completeness, for two purposes: 1. to specify that completing evidence is not barred by the hearsay rule; and 2. to extend its coverage to oral statements. The Committee has discussed the proposal at the last two meetings and will continue review at this meeting. The Reporter's memorandum on the subject is behind Tab 4.

V. Rule 615

Judge John Woodcock, a former member of the Committee, has asked the Committee to consider possible changes to Rule 615, the rule on excluding witnesses from trial until they testify. The suggested changes are: 1) placing exclusion within the court's discretion; 2) imposing a timing requirement for a Rule 615 motion; and 3) adding a provision explicitly stating that experts are exempt from a sequestration order. The Reporter's research on Rule 615 in response to these suggestions uncovered another question for the Committee's consideration, on which courts are divided: whether the Rule should be amended to provide that a Rule 615 order extends to prohibiting discussions with prospective jurors *outside* the courtroom. The Reporter's memorandum on Rule 615 is behind Tab 5.

VI. A Roadmap on Impeachment and Rehabilitation

Maryland Rule of Evidence 616 is a unique rule. It is a "roadmap" to guide judges and practitioners on the rules that are pertinent to all forms of impeachment and rehabilitation. The Maryland drafters thought that a roadmap would be useful because Article 6 is silent as to many of the rules on impeachment. A member of the public suggests that the Committee consider proposing an amendment along the lines of Maryland Rule 616. The Reporter's memo on the subject is behind Tab 6.

VII. Rule 404(b)

The Committee's proposed amendment to Rule 404(b) was unanimously approved by the Standing Committee for release for public comment. The public comment period is August 15-February 15. The Reporter has prepared a memo which sets forth the amendment and discusses all

the comments submitted as of the date the Agenda Book is posted. That memo is behind Tab 7. Any comment received in the interim between the release of the Agenda Book and the day of the meeting will be discussed in a supplementary memo to be distributed at the Committee meeting.

VIII. *Crawford* Outline

The Reporter's updated outline on cases applying the Supreme Court's Confrontation Clause jurisprudence is behind Tab 8.

{ SEQ CHAPTER \h \r 1}FORDHAM

University School of Law

Lincoln Center, 150 West 62nd Street, New York, NY 10023-7485

Daniel J. Capra
Philip Reed Professor of Law

Phone: 212-636-6855
e-mail: dcapra@law.fordham.edu

Memorandum To: Advisory Committee on Evidence Rules
From: Daniel J. Capra, Reporter
Re: Roundtable Discussion at Fall Meeting
Date: October 1, 2018

The Committee has invited a small group of experts to participate in roundtable discussion regarding the major agenda items for the Fall meeting. This discussion, among participants and Committee members, will take place on the morning of the Fall meeting. The agenda items are:

1. Whether to propose an amendment to Rule 702 to prohibit experts from overstating their opinion --- a proposal that began as a way to address forensic expert testimony and might be expanded to cover all experts.
2. Whether to propose an amendment to Rule 702 to specify that the admissibility requirements in the rule are to be determined by the court under Rule 104(a).
3. Whether to propose an amendment to Rule 106 to allow completing hearsay to be admitted over a hearsay objection.
4. A new item (which will be discussed if time permits): whether to propose an amendment to Rule 615, to: a) provide that sequestration orders are discretionary rather than mandatory; b) impose a timing requirement on sequestration motions; c) specify that experts are excepted from exclusion; and/or d) specify that a Rule 615 order extends to preclude prospective witnesses from obtaining trial testimony outside the court.

The roundtable discussion will not consist of formal presentations. The idea is to have an interchange among the participants and Committee members regarding these agenda items. The goal is for the Committee to obtain information that will help it to decide whether to pursue any or all of these agenda items, and if so, what a possible amendment should look like.¹

¹ A transcript of the roundtable discussion will be published in a forthcoming edition of the Fordham Law Review.

The background memos for the roundtable discussion can be found behind the tabs for each of the agenda items.

Bios of Roundtable Participants

Hon. Phillip A. Brimmer

Judge Philip A. Brimmer is a district judge for the United States District Court for the District of Colorado. He was appointed in 2008. He graduated from Harvard College in 1981 and Yale Law School in 1985. He was a law clerk for the Honorable Zita L. Weinshienk of the United States District Court for the District of Colorado from 1985 to 1987, after which time he joined the Denver office of Kirkland & Ellis. At Kirkland & Ellis, his practice areas included toxic torts, environmental insurance coverage disputes, and general commercial litigation. From 1994 to 2001, he was a deputy district attorney with the Denver District Attorney's Office. He was an Assistant United States Attorney for the District of Colorado from 2001 to 2008, serving as chief of the Major Crimes section and later as chief of the Special Prosecutions section. As a prosecutor with the Denver District Attorney's Office and the United States Attorney's Office, he tried over 100 criminal cases.

Hon. James O. Browning

Judge Browning is a district judge for the United States District Court for the District of New Mexico. He was nominated by President George W. Bush and appointed in 2003. He received a Bachelor of Arts degree from Yale University in political science in 1978, graduating magna cum laude. He earned his J.D. from the University of Virginia Law School in 1981, where he was Editor in Chief of the Virginia Law Review. After law school, Judge Browning served as law clerk to Judge Collins J. Seitz on the United States Court of Appeals for the Third Circuit from 1981 to 1982, and then clerked for Justice Lewis F. Powell of the Supreme Court of the United States from 1982 to 1983. After finishing his judicial clerkships, Judge Browning returned to New Mexico and began working at the law firm Rodey, Dickason, Sloan, Akin, & Robb. He was a Deputy attorney general of New Mexico Department of Justice from 1987 to 1988. Afterwards, he returned to private practice at Rodey, Dickason, Sloan, Akin, & Robb. In 1990, he formed his own law firm, Browning & Peifer, P.A. He continued to practice at Browning & Peifer until his appointment to the federal bench in 2003.

Eric G. Lasker, Esq.

Mr. Lasker is a partner in the Washington, D.C. law firm Hollingsworth LLP, where he litigates a wide variety of complex civil matters, with a current focus on toxic torts, environmental litigation, and pharmaceutical products liability. Mr. Lasker has represented clients in toxics/environmental matters involving herbicides, asbestos, lead paint, nonionizing radiation, PCBs, and chemical solvents and in pharmaceutical and medical device products liability claims involving antipsychotics, antifungals, antiepileptics, cancer medications, cough/cold treatments, intraocular and contact lenses, and obstetrical drugs. His practice focuses on matters at the intersection of science and law, and he accordingly has both litigated and published extensively on expert admissibility under Rule 702 and Daubert. Mr. Lasker has been recognized for his work as an American Lawyer “Litigator of the Week,” a Bloomberg News “Rainmaker,” a recipient of the 2012 George W. Yancey Memorial Award and the 2014 Burton Award for excellence in legal writing, and as one of Law360’s five Products Liability MVPs for 2013.

Along with George Mason University law professor David Bernstein, Mr. Lasker authored “Defending *Daubert*: It’s Time to Amend Federal Rule of Evidence 702,” 57:1 William & Mary L. Rev. (2015). In this article, Mr. Lasker reviews the drafting history of the 2000 amendments to Rule 702 and compares the drafters’ intent with how Rule 702 is being applied in federal district courts and federal courts of appeal. Mr. Lasker concludes that many courts have departed from this drafting intent and recommends that Rule 702 be amended to address this concern.

Professor Christopher Mueller

Christopher Mueller is the Henry S. Lindsley Professor of Law at the University of Colorado Law School, where he has taught since 1985. His scholarship focuses on Evidence, Civil Procedure, and Complex Litigation. Professor Mueller has written on privileges, hearsay, character evidence, expert testimony, plea bargaining, cross-examination, presumptions, and impeachment of jury verdicts. He is a former Evidence chair of the Section on Evidence of the American Association of Law Schools. He serves on the Colorado Civil Rules and Evidence Committees and is a life member of the American Law Institute. He has taught at the law schools of the University of Illinois, Emory, and the University of Wyoming. On graduation from law school, he practiced law with Pillsbury, Madison & Sutro in San Francisco.

Professor Mueller has collaborated for many years with Laird C. Kirkpatrick (George Washington University Law) on the five-volume treatise *Federal Evidence*, now in its fourth edition (Thompson/West 2013), a work that has been cited by the Supreme Court 17 times. He and Professor Kirkpatrick collaborate with Professors Liesa Richter (Oklahoma Law) and Charles Rose III (Stetson Law) on a one-volume treatise entitled *Evidence: Doctrine and Practice* (Wolters

Kluwer, fifth edition 2018). Professor Mueller is also the author of a coursebook in Civil Procedure entitled Twenty-First Century Procedure (Wolters Kluwer 2nd ed. 2017).

Hon. Kathleen M. O'Malley

Kathleen M. O'Malley was appointed to the United States Court of Appeals for the Federal Circuit by President Barack Obama in 2010. Prior to her elevation to the Federal Circuit, Judge O'Malley was appointed to the United States District Court for the Northern District of Ohio by President William J. Clinton on October 12, 1994.

Judge O'Malley served as First Assistant Attorney General and Chief of Staff for Ohio Attorney General Lee Fisher from 1992-1994, and Chief Counsel to Attorney General Fisher from 1991-1992. From 1985-1991, she worked for Porter, Wright, Morris & Arthur, where she became a partner. From 1983-1984, she was an associate at Jones, Day, Reavis and Pogue.

During her sixteen years on the district court bench, Judge O'Malley presided over in excess of 100 patent and trademark cases and sat by designation on the United States Circuit Court for the Federal Circuit. As an educator, Judge O'Malley has regularly taught a course on Patent Litigation at Case Western Reserve University Law School; she is a member of the faculty of the Berkeley Center for Law & Technology's program designed to educate Federal Judges regarding the handling of intellectual property cases. Judge O'Malley serves as a board member of the Sedona Conference; as the judicial liaison to the Local Patent Rules Committee for the Northern District of Ohio; and as an advisor to national organizations publishing treatises on patent litigation (Anatomy of a Patent Case, Complex Litigation Committee of the American College of Trial Lawyers; Patent Case Management Judicial Guide, Berkeley Center for Law & Technology).

Judge O'Malley began her legal career as a law clerk to the Honorable Nathaniel R. Jones, Sixth Circuit Court of Appeals in 1982-1983. She received her J.D. degree from Case Western Reserve University School of Law, Order of the Coif, in 1982, where she served on Law Review and was a member of the National Mock Trial Team. Judge O'Malley attended Kenyon College in Gambier, Ohio where she graduated magna cum laude and Phi Beta Kappa in 1979.

Paul L. Shechtman, Esq.

WORK EXPERIENCE:

May 2016 – Present: Bracewell LLP, Partner

October 2011 - May 2016: Zuckerman Spaeder, LLP, Partner

February 1997 - September 2011: Stillman, Friedman & Shechtman, P.C., Partner

June 2018 – Present: New York State Bar Association Task Force on Wrongful Convictions

June 2017 – Present: Member, National Conference of Bar Examiners Evidence Drafting Committee

May 2017 – Present: New York State Justice Task Force

October 2010 - November 2017: Member, New York State Permanent Sentencing Commission

September 2010 - September 2016: Member, Judicial Conference Advisory Committee on Evidence Rules

February 2006 - December 2006: Chair, New York State Commission on Lobbying

May 1998 - December 2006: Chair, New York State Ethics Commission

January 1988 – Present: Adjunct Professor, Columbia Law School, (Criminal Procedure and Evidence) (1990 & 1992: award for outstanding teaching)

January 1998 - December 2006: Chair, New York State Judicial Screening Committee

April 1995 - February 1997: Director of Criminal Justice and Commissioner of the Division of Criminal Justice Services for New York State

February 1994 - April 1995: Chief, Criminal Division, United States Attorney’s Office, Southern District of New York

June 1987 - February 1994: Counsel to the District Attorney, New York County District Attorney’s Office

June 1986 - May 1987: Associate Independent Counsel, Investigation of Michael Deaver

July 1985 - June 1987: Assistant Professor, University of Pennsylvania Law School (1987: award for outstanding teaching)

March 1981 - July 1985: Chief Appellate Attorney and Chief, General Crimes Unit, United States Attorney’s Office, Southern District of New York

July 1979 - July 1980: Law Clerk to Hon. Warren E. Burger, Chief Justice of the United States Supreme Court

September 1978 - June 1979: Law Clerk to Hon. Louis H. Pollack, United States District Court, Eastern District of Pennsylvania

ACADEMIC BACKGROUND:

1975-1978 Harvard Law School, magna cum laude
 1971-1973 Oxford University, masters degree in economics
 1967-1971 Swarthmore College, B.A. in economics, high honors

Judith A. Smith, Esq.

Judy Smith is an Assistant United States Attorney in Colorado and Chief of the Colorado office’s Cybercrime and National Security Section where she supervises and prosecutes cyber, national security, and child exploitation cases. She has been a prosecutor for 15 years. Ms. Smith’s legal experience includes working at the law firm Gibson, Dunn & Crutcher and serving

as a Deputy District Attorney in the Denver District Attorney's Office. Ms. Smith received her bachelor and law degrees from the University of Colorado. She obtained her Master of Laws from Columbia Law School while teaching legal research, writing, and appellate advocacy there.

Aimee H. Wagstaff, Esq.

In 2010, Aimee became a founding partner of Andrus Wagstaff. The vast majority of Aimee's litigation is done through national mass tort consolidations, usually multidistrict litigations (MDLs) or Judicial Council Coordinated Proceedings (JCCPs). Aimee has been appointed by federal and state court Judges across the country to co-lead four national litigations, representing tens of thousands of injured claimants.

In 2016, Judge Chhabria appointed Aimee to serve as national Co-Lead counsel of MDL 2741- In Re: Roundup Products Liability Litigation, in the United States District Court for the Northern District of California. In 2015, Aimee made MDL history when Judge Kathryn H. Vratil appointed her to serve as Co-Lead counsel of the first ever majority women MDL plaintiffs' steering committee (PSC) – MDL 2652: In Re: Ethicon, Inc., Power Morcellator Products Liability Litigation, in the United States District Court for the District of Kansas. Recently, Judge Highberger appointed Aimee to serve on the Plaintiffs' Steering Committee of JCCP 4775: In Re Risperdal Product Liability Case, in Los Angeles County, California. Additionally, Chief Judge Joseph R. Goodwin, of the United States District Court for the Southern District of West Virginia, appointed Aimee to serve on the Plaintiffs' Steering Committee of: (1) MDL 2187: In Re C.R. Bard, Inc, Pelvic Repair System Products Liability Litigation; (2) MDL 2325: In Re American Medical Systems, Inc. Pelvic Repair System Products Liability Litigation Repair; (3) MDL 2326: In Re Boston Scientific Corporation, Pelvic Repair System products Liability Litigation; (4) MDL 2327: In Re Ethicon, Inc, Pelvic Repair System Products Liability Litigation; (5) MDL 2387: In Re Coloplast Corp. Pelvic Support Systems Product Liability Litigation; (6) MDL 2440: In Re Cook Medical, Inc. Pelvic Repair System Product Liability Litigation; and (7) MDL: 2511 In Re Neomedic Pelvic Repair System Product Liability Litigation (collectively, transvaginal mesh (TVM) MDLs). Judge Goodwin also appointed Aimee to serve on the eight-member national executive committee overseeing the TVM MDLs and to serve as national co-lead of MDL 2326 against Boston Scientific Corporation.

Aimee earned her undergraduate degree in Marine Science and Communications from the University of San Diego. She earned her law degree from University of Denver Sturm College of Law.

Rick Williamson, Esq.

1991- present: Assistant Federal Public Defender, First Assistant.

Office of the Federal Public Defender, Districts of Colorado and Wyoming.

1981-1991 Private practice, San Diego.

1972-1981 Trial Attorney, Chief Trial Attorney, Federal Defenders of San Diego, Inc.

Law School: University of San Diego, graduated cum laude 1972.

Undergrad: University of California, San Diego, graduated 1969.

Agenda_Forensics and bitemarks Briefing_02092018_DRAFT

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Fri, 09 Feb 2018 09:11:53 -0500
Attachment Agenda Foren ic and bitemark Briefing 02092018 DRAFT doc (24 41 kB)

Ted,

I think we should use this for the DAG briefing and I think you should use it for the AG briefing. Feel free to make edits and push back. It needs to stay short. Please call after you've reviewed.

Thanks,
K

Agenda_Forensics and Bitemarks Briefing_02092018

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Fri, 09 Feb 2018 10:01:41 -0500
Attachment Agenda Foren ic and Bitemark Briefing 02092018 doc (24 42 kB)

Hi Ted,

Attached is the agenda we discussed with the edit as to the start time. Feel free to make any edits before you share.

Thanks,
Kira

Agenda_Forensics and bitemarks Briefing_02092018_DRAFT

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Fri, 09 Feb 2018 09:11:53 -0500
Attachment Agenda Foren ic and bitemark Briefing 02092018 DRAFT doc (24 41 kB)

Ted,

I think we should use this for the DAG briefing and I think you should use it for the AG briefing. Feel free to make edits and push back. It needs to stay short. Please call after you've reviewed.

Thanks,
K

DAG Meeting-Feb 12 9:10 a.m.

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Murphy, Marcia (ODAG)" <(b) (6)>
Date: Fri, 09 Feb 2018 13:30:34 -0500
Attachment Briefing Document for Forensic Bitemark Discussion doc (24.5 kB)

Marcy,

Attached is a short briefing document for the DAG's review in preparation for our 9:10 a.m. meeting on Monday.

Thanks,

Ted

Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave. NW
Washington, DC 20530

(b) (6)
(u) (v)

Bitemark Meeting

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Morrissey, Brian (OAG)" <(b) (6)>
Date: Mon, 12 Feb 2018 17:47:20 -0500
Attachment Forensic and Bitemark Briefing Outline doc (24.86 kB)

Brian,

Attached is a 2-page outline put together by Kira – with some of my thoughts added – about the strategy behind the bitemark proposal as some additional background before we meet tomorrow.

Ted

Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave. NW
C 20530

(b) (6)
(b) (6)

Goldsmith Proposed Talkers for FRE

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Thu, 28 Sep 2017 18:16:30 -0400
Attachment Gold mith Propo ed Talker for FRE doc (27 55 kB)

Hi Ted,

Attached are my thoughts on what Andrew should address at the FRE conference. What do you think about this? I welcome your thoughts before I send them to him.

-K

PCAST & FRE

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: Amie Ely (b) (6) naag.org>, "Hunt, Ted (ODAG)" <(b) (6)>
Date: Mon, 02 Oct 2017 10:27:11 -0400
Attachment Unnamed Attachment (3 79 kB)

(b) (6)

You can ask the guards the best way to find the OLP suite. We are on the (b) (6). If you have any issues entering the building or finding the room, please contact me by cell phone at (b) (6) or via email at (b) (6).

From: Amie Ely (b) (6) naag.org]
Sent: Monday, October 2, 2017 10:21 AM
To: Antell, Kira M. (OLP) <(b) (6)>
Subject: Re: PCAST & FRE

Thursday at 4 would work for me, thanks. Your office or mine?

From: Antell, Kira M. (OLP) <(b) (6)>
Sent: Monday, October 2, 2017 10:08:07 AM
To: Amie Ely
Subject: RE: PCAST & FRE

Hi Amie,

That sounds great. We would love to catch you on the FRE 702 efforts. How about Thursday at 3:30 or 4:00?

Thanks,
Kira

From: Amie Ely (b) (6) naag.org]
Sent: Friday, September 29, 2017 10:43 AM
To: Antell, Kira M. (OLP) <(b) (6)>
Subject: PCAST & FRE

Hi Kira!

I hope you're well. I'll be in DC for a few days next week; would be happy to sit down with you and/or Ted on Tuesday morning, or late Tuesday or Thursday afternoon.

I've also heard some murmuring about attempts to engraft the PCAST report onto FRE 702—is that really in the works? Would love to learn more, as there are some folks in the AG community who have been following the PCAST issues pretty closely.

Best,
Amie

Amie Ely
Director, NAGTRI Center for Ethic & Public Integrity
National Association of Attorney General
1850 M Street NW, 12th Floor
Washington, DC 20036
Desk: (b) (6)
Cell: (b) (6)
Email: (b) (6) naag.org

BEGIN:VTIMEZONE
TZID:Eastern Standard Time
BEGIN:STANDARD
DTSTART:16010101T020000
TZOFFSETFROM:-0400
TZOFFSETO:-0500
RRULE:FREQ=YEARLY;INTERVAL=1;BYDAY=1SU;BYMONTH=11
END:STANDARD
BEGIN:DAYLIGHT
DTSTART:16010101T020000
TZOFFSETFROM:-0500
TZOFFSETO:-0400
RRULE:FREQ=YEARLY;INTERVAL=1;BYDAY=2SU;BYMONTH=3
END:DAYLIGHT
END:VTIMEZONE

PCAST & FRE

Where: RFK Building, 950 Pennsylvania Avenue NW, (b) (6)
When: Thu Oct 05 16:00:00 2017 -04:00
Until: Thu Oct 05 16:45:00 2017 -04:00
Organizer: Common Name Antell, Kira M (OLP) MAILTO:(b) (6)
Required Attendees: ROLE=REQ-PARTICIPANT PARTSTAT=NEEDS-ACTION RSVP=TRUE Common Name=Amie Ely MAILTO:(b) (6)@naag.org
ROLE=REQ-PARTICIPANT PARTSTAT=NEEDS-ACTION RSVP=TRUE Common Name=Hunt, Ted (ODAG) MAILTO:(b) (6)

Duplicative Material see bates stamp 20220314-09446

Revised TPs

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Thu, 19 Oct 2017 17:47:57 -0400
Attachment Ted Hunt Proposed Talker on PCAST v4 pdf (230.25 kB); Ted Hunt Proposed Talker on PCAST_v4.docx (23.26 kB)

Some thoughts on your TPs Edits in redline and PDF so you can see it

Kira Antell
Senior Counsel
Office of Legal Policy
U.S. Department of Justice
950 Pennsylvania Avenue, NW
Washington, DC 20530

(b) (6)
(b) (6)

Re: Comment for story about forensic science for The Nation

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Fri, 10 Nov 2017 11:29:58 -0500

Thanks! I suggest sending to Lauren Ehram and CC me and Andrew Hudson.

Sent from my iPhone

On Nov 10, 2017, at 10:43 AM, Hunt, Ted (ODAG) <(b) (6)> wrote:

FYSA

Begin forwarded message

From: Tim Requarth <(b) (6)>
Date: November 10, 2017, 11:29 AM PST
To: (b) (6)
Subject: Comment for story about forensic science for The Nation

Dear Mr. Hunt,

I'm a freelance writer on a signment with The Nation for a feature length story on forensic science. As you know, some aspects of forensic science have been recently criticized (e.g., in the 2016 PCAST report), although not always convincingly. As the DOJ's Senior Advisor on Forensics, I'm especially interested to hear your perspective on this issue, and what your plans are at the DOJ moving forward.

Would you be available to speak over the phone for comment?

A little more about me: I mainly write about science, but I've more recently been interested in how science impact criminal justice. You can read e ample of my writing on the web site below, if you'd like. You might particularly be interested in a [recent story I wrote](#) for The New York Times--it's not about forensic science, but a neuroscience-inspired court being piloted by the San Francisco DA's office.

Thank you,

--
Tim Requarth
Science journalist
Cell: (b) (6)
(b) (6)

FW: Comment for story about forensic science for The Nation

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Ehrsam, Lauren (OPA)" <(b) (6)>, "Hudson, Andrew (OLP)" <(b) (6)>
Cc: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Fri, 10 Nov 2017 11:49:28 -0500

Lauren and Drew,

See the below request for comment. I have not responded, and will talk to you about this on Monday.

Ted

From: Tim Requarth [mailto:(b) (6)]
Sent: Friday, November
To: Hunt, Ted (ODAG) <(b) (6)>
Subject: Comment for story about forensic science for The Nation

Duplicative Material see bates stamp 20220314-09790

Re: Comment for story about forensic science for The Nation

From: Tim Requarth <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Tue, 14 Nov 2017 09:27:34 -0500

Thanks, Ted. I look forward to hearing from OPA.

On Mon, Nov 13, 2017 at 3:40 PM, Hunt, Ted (ODAG) <(b) (6)> wrote:

Hi Tim,

Thanks for your message. I've reached out to DOJ OPA, per Department policy, before responding to your request. Will be back in touch with you soon.

Thanks,

Ted

From: Tim Requarth [mailto:(b) (6)]
Sent: Friday, November 10, 2017 9:29 AM
To: Hunt, Ted (ODAG) <(b) (6)>
Subject: Comment for story about forensic science for The Nation

Duplicative Material see bates stamp 20220314-09790

Re: Comment for story about forensic science for The Nation

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Tue, 28 Nov 2017 18:32:17 -0500

Will do. Look forward to discussing.

Sent from my iPhone

On Nov 28, 2017, at 6:30 PM, Hunt, Ted (ODAG) <(b) (6)> wrote:

|
FYI. Take a look and we can discuss this tomorrow.

Thx.

Ted

From: Ehram, Lauren (OPA)
Sent: Tuesday, November 28, 2017 5:58 PM
To: Hunt, Ted (ODAG) <(b) (6)>
Cc: Hudson, Andrew (OLP) <(b) (6)>
Subject: FW: Comment for story about forensic science for The Nation

Ted,

(b)(5)



Thank you,

Lauren

From: Tim Requarth [mailto:(b) (6)]
Sent: Monday, November 27, 2017 11:44 AM
To: Ehram, Lauren (OPA) <(b) (6)>
Cc: Hudson, Andrew (OLP) <(b) (6)>
Subject: Re: Comment for story about forensic science for The Nation

Hi Lauren,

Please find my question below. First a little preamble. There have been a many recent criticism from scientific group and the mainstream media of forensic science methods, but the conversation around forensic science seems to be rife

with misunderstandings. My purpose in reaching out to Mr. Hunt is to give him the opportunity to respond directly to those criticisms as head of the new Forensic Science Working Group. In the course of hearing how he would respond to some of these concerns, I'd like to better understand how he thinks about possible reforms.

The questions below reflect the criticisms I've read in recent scientific reports (NAS, PCAST, AAAS), seen reported of other media outlets, and heard repeated by forensic experts, lawyers, and scientists in the course of my own reporting.

Thank you again for taking the time to look over these, and for considering an interview with Mr. Hunt.

1. In response to the 2016 PCAST report on forensic science, the DOJ said it would "not be adopting the recommendations related to the admissibility of forensic science evidence." As head of the new Forensic Science Working Group will you continue support this policy, and/or how will you address the fact that multiple scientific bodies (PCAST, NRC, AAAS), have concluded that many forensic methods -- including latent fingerprint, firearms/toolmarks, and bitemarks -- either lack scientific validity or have not yet been scientifically validated?
2. The 2009 NAS report suggested that the DOJ should not be the home of forensic science reform, even if advised by outside stakeholders, citing a strong potential for bias, despite well-meaning intentions. How would you respond to this?
3. A DOJ press release dated August 7, 2017 states: "The Department stands with the forensic science community and against efforts by some to reject reliable and admissible forensic evidence." What is the DOJ's definition of "reliable" and how is it determined?
4. Given the DOJ's statement that it "stands with the forensic science community" what steps will the Forensic Science Working Group take to ensure that it will consider potential criticisms of forensic theories or practices -- which may or may not undermine entire fields of forensic science (CBLA is one past example) -- in an unbiased manner?
5. Given the adversarial nature of the American justice system and your experience as a prosecutor, what factors do you think might lead prosecutors to resist attempts to limit the types of forensic evidence admissible in court and/or attempts to soften the language of certainty allowed in forensic testimony? What factors might encourage prosecutors to support such reforms?
6. The NCFCS proposed a "Statistical Statements in Forensic Testimony," which you ultimately voted against. At NCFCS meeting #13 (April 2017), you remarked that you were concerned the statistical views document would suggest a fingerprint examiner or toolmark examiner should not be able to say "I have identified this known print to this questioned print...that a firearms examiner shouldn't be allowed to say that this shell casing was fire from this gun." Some forensic experts, along with respected scientists, have said that scientific evidence does not support such "absolute" or even "practical" claims of a match. Rather, they state that examiners giving testimony in court should present the chances that their assessment could be right/wrong, based on sources of potential error or uncertainty in their field. For fields where reliable numbers are not available, the suggestion is that forensic expert witnesses indicate an absence of studies. Why do you oppose adding that language to testimony?
7. The Jan 2017 issue of the United States Attorneys' Bulletin states: "In April 2015, FBI, IP, and NACDL issued a joint press release in which the FBI acknowledged that at least 90 percent of trial transcripts analyzed as part of the MHCA review contained erroneous statements. The FBI found that 26 of 28 FBI agent/analysts provided either testimony with erroneous statements or submitted laboratory reports with erroneous statements. The review found that the overstated forensic matches favored prosecutors in over 95 percent of the trials reviewed." How will the new Forensic Science Working Group in the DOJ improve forensic expert testimony and work to prevent biased and/or erroneous testimony that tends to favor prosecutors?

On Wed, Nov 22, 2017 at 3:35 PM, Tim Requarth <(b) (6)> wrote

Thanks for considering it. I'll have those questions over to you later today or during the weekend. Have a great Thanksgiving!

On Tue, Nov 21, 2017 at 9 10 AM, Ehr am, Lauren (OPA) <(b) (6)> wrote

Hi Tim,

Happy to take a look at questions if you want to send and go from there.

Lauren

From: Tim Requarth [mailto:(b) (6)]
Sent: Monday, November 20, 2017 9:17 PM

To: Ehr am, Lauren (OPA) <(b) (6)>

Cc: Hudson, Andrew (OLP) <(b) (6)>
Subject: Re: Comment for story about forensic science for The Nation

Hi Lauren,

Thank you so much for offering to take the time to put together some responses. I do appreciate it. If it's at all possible, however, I'd be grateful for the opportunity to speak with Mr. Hunt directly. I'm genuinely interested in how he plans to address improving forensic science, and feel the best way for me to present his views is to hear directly from him. I spoke with his colleague Bill Fitzpatrick, former president of NDAA, and he strongly recommended we speak. Is it possible to speak for even for 15 minutes? Sorry for the hassle & thank you for considering it.

On Fri, Nov 17, 2017 at 2:56 PM, Ehrsam, Lauren (OPA) <(b) (6)> wrote

Not sure without seeing the questions, but potentially on the record and attributable to me, but without knowing what the questions are I would not be able to agree to attribution. Thank you!

From: Tim Requarth [mailto:(b) (6)]
Sent: Friday, November 17, 2017 2:52 PM

To: Ehrsam, Lauren (OPA) <(b) (6)>
Cc: Hudson, Andrew (OLP) <(b) (6)>
Subject: Re: Comment for story about forensic science for The Nation

Thank you again for the quick reply. Would the answer be on the record, attributable to Ted Hunt? Thank you!

On Fri, Nov 17, 2017 at 2:36 PM, Ehrsam, Lauren (OPA) <(b) (6)> wrote:

Hi Tim,

This would be in lieu of a phone interview.

Thank you,

Lauren

From: Tim Requarth [mailto:(b) (6)]
Sent: Friday, November 17, 2017 2:27 PM
To: Ehrsam, Lauren (OPA) <(b) (6)>
Cc: Hudson, Andrew (OLP) <(b) (6)>
Subject: Re: Comment for story about forensic science for The Nation

Hi Lauren,

Thanks for the speedy reply. Would you just mind clarifying whether these questions would be in lieu of a phone interview with Ted Hunt or in anticipation of one? Thanks,

On Fri, Nov 17, 2017 at 12:47 PM, Ehrsam, Lauren (OPA) <(b) (6)> wrote:

Hi Tim,

Thank you for getting in touch! Would you mind sending a few questions and I'll work on seeing if we can get you some responses.

Thank you,

Lauren

Lauren Ehram

Spokeswoman and Media Affairs Specialist

O: (b) (6) C: (b) (6)

For information on office hours, access to media events, and standard ground rules for interviews, please click [here](#).

From: Tim Requarth [[mailto:](#) (b) (6)]

Sent: Friday, November 10, 2017 9:29 AM

To: Hunt, Ted (ODAG) <(b) (6)>

Subject: Comment for story about forensic science for The Nation

Duplicative Material see bates stamp 20220314-09790

RE: Comment for story about forensic science for The Nation

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Ehrsam, Lauren (OPA)" <(b) (6)> "Hudson, Andrew (OLP)" <(b) (6)>
Date: Fri, 17 Nov 2017 13:49:28 -0500

Ok, thanks

From: Ehrsam, Lauren (OPA)
Sent: Friday, November 17, 2017 12:46 PM
To: Hunt, Ted (ODAG) <(b) (6)> Hudson, Andrew (OLP) <(b) (6)>
Subject: RE: Comment for story about forensic science for The Nation

Hi Ted,

We are asking the reporter for written questions and will circle back when we get them.

Thank you!
Lauren

From: Hunt, Ted (ODAG)
Sent: Tuesday, November 14, 2017 9:10 AM
To: Ehrsam, Lauren (OPA) <(b) (6)> Hudson, Andrew (OLP) <(b) (6)>
Subject: FW: Comment for story about forensic science for The Nation

Checking back in about this request. What are your thoughts re how to proceed?

Thanks,

Ted

From: Tim Requarth [[\(b\) \(6\)](mailto:(b) (6))]
Sent: Friday, November 10, 2017 9:29 AM
To: Hunt, Ted (ODAG) <(b) (6)>
Subject: Comment for story about forensic science for The Nation

Duplicative Material see bates stamp 20220314-09790

RE: Comment for story about forensic science for The Nation

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Ehrsam, Lauren (OPA)" <(b) (6)>
Cc: "Hudson, Andrew (OLP)" <(b) (6)>
Date: Tue, 28 Nov 2017 18:29:43 -0500

Thanks, Lauren. I'll take a look, put potential responses together, and work with you on the appropriate extent of our comments.

Ted

From: Ehrsam, Lauren (OPA)
Sent: Tuesday, November 28, 2017 5:58 PM
To: Hunt, Ted (ODAG) <(b) (6)>
Cc: Hudson, Andrew (O <(b) (6)>
Subject: FW: Comment for story about forensic science for The Nation

Duplicative Material see bates stamp 20220314-11071



RE: Comment for story about forensic science for The Nation

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Wed, 29 Nov 2017 09:08:30 -0500

OK Give me a call when you have a second

From: Antell, Kira M. (OLP)
Sent: Wednesday, November 29, 2017 8:09 AM
To: Hunt, Ted (ODAG) <(b) (6)>
Subject: RE: Comment for story about forensic science for The Nation

I have thoughts.

From: Hunt, Ted (ODAG)
Sent: Tuesday, November 28, 2017 6:30 PM
To: Antell, Kira M. (OLP) <(b) (6)>
Subject: FW: Comment for story about forensic science for The Nation

FYI. Take a look and we can discuss this tomorrow.

Thx.

Ted

From: Ehram, Lauren (OPA)
Sent: Tuesday, November 28, 2017 5:58 PM
To: Hunt, Ted (ODAG) <(b) (6)>
Cc: Hudson, Andrew (OLP) <(b) (6)>
Subject: FW: Comment for story about forensic science for The Nation

Duplicative Material see bates stamp 20220314-11071

RE: Comment for story about forensic science for The Nation

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Tue, 23 Jan 2018 18:24:26 -0500
Attachment: Re pon e to The Nation Que tion KMA doc (17 05 kB)

(b)(5)

From: Hunt, Ted (ODAG)
Sent: Tuesday, January 23, 2018 6:18 PM
To: Antell, Kira M. (OLP) <(b) (6)>
Subject: RE: Comment for [redacted] nce for The Nation

Kira,

Here's what I'm thinking about sending out to Lauren. I'd love to respond in full, but will keep out powder dry for now.

Ted

From: Antell, Kira M. (OLP)
Sent: Tuesday, January 23, 2018 11:44 AM
To: Hunt, Ted (ODAG) <(b) (6)>
Subject: RE: Comment for story about forensic science for The Nation

My thoughts below

From: Hunt, Ted (ODAG)
Sent: Tuesday, January 23, 2018 11:05 AM
To: Antell, Kira M. (OLP) <(b) (6)>
Subject: FW: Comment for story about forensic science for The Nation

FYI

From: Ehram, Lauren (OPA)
Sent: Tuesday, January 23, 2018 10:22 AM
To: Hunt, Ted (ODAG) <(b) (6)>
Cc: Hudson, Andrew (OLP) <(b) (6)>
Subject: FW: Comment for story about forensic science for The Nation

Hi Ted,

It looks like this won't be friendly, but I wanted to see if you had any thoughts on the questions below.

Thank you,
Lauren

From: Tim Requarth [mailto:(b) (6)]
Sent: Monday, January 22, 2018 12:22 PM
To: Ehram, Lauren (OPA) <(b) (6)>
Cc: Hudson, Andrew (OLP) <(b) (6)>
Subject: Re: Comment for story about forensic science for The Nation

Hi Lauren,

Thanks again for passing along answers to my previous questions for Ted Hunt. The article is going to press this week, and I have a few quick follow-up questions. I want to offer Mr. Hunt and/or the DOJ the opportunity to respond to what appears in the final draft of the article, so I'd be grateful if you could find the time to respond in the next few days.

1 At [NCFS Meeting #9](#) [NCFS meeting #9, page 11], Ted Hunt lodged one of two "no" votes against dropping the phrase "reasonable degree of scientific certainty" from forensic testimony, which was passed by NCFS and later adopted by

DOJ. Why did he vote against dropping phrase "reasonable degree of scientific certainty"? Are forensic experts working for the DOJ using that phrase now?

(b)(5)

2. Previously, you stated (attributable to OPA): "This past August, the Deputy Attorney General announced that the Department would continue its work to finalize the ULTRs. These discipline specific documents will direct Department examiners to use designated terminology and testimonial conclusions that will accurately convey the results of forensic tests and analyses." Does Ted Hunt currently support ULTRs dropping the phrase "reasonable degree of scientific certainty" from forensic testimony? Will the DOJ encourage/support language in ULTRs dropping that phrase?

(b)(5)

3. When we asked about bitemarks previously, the response (attributable to OPA) was: "The Department does not perform bitemark analysis, and we are unaware of bitemark analysis being performed inside any state, local, or federal forensic science laboratory." Regardless of whether the DOJ hires forensic examiners to examine bitemarks, Ted Hunt recently made comments to effect that he believes the technique is potentially valid. We have heard from multiple sources that at the Oct 10, 2017 meeting of the NAS Committee on Science, Technology & the Law, Mr. Hunt said with regards to bitemarks that the "jury was still out." Given that there have been multiple exonerations in cases that relied on bitemark testimony, the Texas Forensic Science Commission has [called for a moratorium](#) on the technique, the [ABFO has told its dentists](#) not to testify they can make a match, and many studies show examiners can't reliably use bitemarks for identification. It seems uncontroversial to say that the technique for specific identifications is not valid. What led Ted Hunt to draw the conclusion that "the jury is still out"? Would Mr. Hunt confirm that he made remarks along those lines? Would he like to offer any response?

(b)(5)

4. We have also heard from multiple sources that at that same Oct 10 NAS meeting a scientist in the audience, Dr. Susan Silbey challenged Mr. Hunt's comment that what constitutes scientific validation of a method is a "difference of opinion," and she suggested Mr. Hunt did not appear have a firm understanding of scientific methodology. We are going to report this exchange. Would Mr. Hunt like to respond?

(b)(5)

5. At a meeting of the Judicial Conference of the United States Committee on Rules of Evidence on Oct 27, 2017, Mr. Hunt described PCAST's approach to scientific validity as "wrong and ill-advised," and at the Oct 10 meeting, described PCAST's definition of science as "narrow." This suggests that Mr. Hunt either does not understand basic scientific methodology or disagrees that the standards of basic scientific methodology that would apply to empirically validating subjective methods in any other scientific field do not apply to the forensic pattern-matching disciplines. Could he clarify his statement and/or position?

(b)(5)

(b)(5)

On Wed, Dec 20, 2017 at 9 03 PM, Tim Requarth <(b)(6)> wrote

Thanks, Lauren!

On Mon, Dec 18, 2017 at 9:05 PM, Ehrsam, Lauren (OPA) <(b)(6)> wrote:

My pleasure And thank you for your patience!

1. In response to the 2016 PCAST report on forensic science, the DOJ said it would “not be adopting the recommendations related to the admissibility of forensic science evidence.” As head of the new Forensic Science Working Group will you continue support this policy, and/or how will you address the fact that multiple scientific bodies (PCAST, NRC, AAAS), have concluded that many forensic methods -- including latent fingerprint, firearms/toolmarks, and bitemarks -- either lack scientific validity or have not yet been scientifically validated?

Attribution: OPA

The Department believes and the law requires that evidence be both relevant and reliable to be admissible in court. The Department practices a wide variety of forensic disciplines in its accredited laboratories and we are confident that each method we use is valid and reliable The Department does not perform bitemark analysis, and we are unaware of bitemark analysis being performed inside any state, local, or federal forensic science.

2. The 2009 NAS report suggested that the DOJ should not be the home of forensic science reform, even if advised by outside stakeholders, citing a strong potential for bias, despite well-meaning intentions. How would you respond to this?

Attribution: OPA

The Department is composed of many component agencies that have in-house forensic laboratories, capabilities, and experts, including forensic laboratory and digital analysis personnel at the FBI, DEA, and ATF. In addition, the Department’s grant-making entities provide approximately \$100 million dollars each year directly to state, local, and tribal organizations to support forensic science research, testing, and backlog reduction needs.

3. A DOJ press release dated August 7, 2017 states: “The Department stands with the forensic science community and against efforts by some to reject reliable and admissible forensic evidence.” What is the DOJ’s definition of “reliable” and how is it determined?

Attribution: OPA

The Department believes—and the law requires—that evidence be both relevant and reliable to be admissible in court The Department practices a wide variety of forensic disciplines in its accredited laboratories and we are confident that each method we use is valid and reliable.

4. Given the DOJ’s statement that it “stands with the forensic science community” what steps will the Forensic Science Working Group take to ensure that it will consider potential criticisms of forensic theories or practices -- which may or may not undermine entire fields of forensic science (CBLA is one past example) -- in an unbiased manner?

Attribution: OPA

The Department has taken unprecedented steps to strengthen forensic science and responsibly report the results of expert analyses in the courtroom. We’re committed to improving the science so that collected evidence can be reliably compared to known sources through increasingly reliable methods The Department is equally committed to ensuring that our examiners only provide expert opinions and conclusions that are supported by available research and data, while not overstating the significance of their findings

- 5 Given the adversarial nature of the American justice system and your experience as a prosecutor, what factors do you think might lead prosecutors to resist attempts to limit the types of forensic evidence admissible in court and/or attempts to soften the language of certainty allowed in forensic testimony? What factors might encourage prosecutors to support such reforms?

Attribution: Hunt

I can unequivocally say that I don’t know of any prosecutor who would consciously choose to offer unreliable evidence or rely on faulty statements of probative value—whether forensic or not. The prosecutor’s duty is to seek justice, not win convictions.

6. The NCFCS proposed a “Statistical Statements in Forensic Testimony,” which you ultimately voted against. At NCFCS meeting #13 (April 2017), you remarked that you were concerned the statistical views document would suggest a fingerprint examiner or toolmark examiner should not be able to say “I have identified this known print to this questioned print...that a firearms examiner shouldn’t be allowed to say that this shell casing was fire from this gun.” Some forensic experts, along with respected scientists, have said that scientific evidence

does not support such “absolute” or even “practical” claims of a match. Rather, they state that examiners giving testimony in court should present the chances that their assessment could be right/wrong, based on sources of potential error or uncertainty in their field. For fields where reliable numbers are not available, the suggestion is that forensic expert witnesses indicate an absence of studies. Why do you oppose adding that language to testimony?

Attribution: OPA

For this question, I’ll refer you back to the source doc. If you visit [this link](#), and go to “Voting Results”, you will see that the views document you reference was voted down by the full Commission with 50% of the votes cast against passage, falling far short of the two-thirds majority needed to pass. It was one of only two documents, out of a total of 43 views and recommendations that did not pass when called to a vote before the full Commission.

7. The Jan 2017 issue of the United States Attorneys’ Bulletin states: “In April 2015, FBI, IP, and NACDL issued a joint press release in which the FBI acknowledged that at least 90 percent of trial transcripts analyzed as part of the MHCA review contained erroneous statements. The FBI found that 26 of 28 FBI agent/analysts provided either testimony with erroneous statements or submitted laboratory reports with erroneous statements. The review found that the overstated forensic matches favored prosecutors in over 95 percent of the trials reviewed.” How will the new Forensic Science Working Group in the DOJ improve forensic expert testimony and work to prevent biased and/or erroneous testimony that tends to favor prosecutors?

Attribution: OPA

This past August, the Deputy Attorney General announced that the Department would continue its work to finalize the ULTRs. These discipline-specific documents will direct Department examiners to use designated terminology and testimonial conclusions that will accurately convey the results of forensic tests and analyses.

From: Tim Requarth [mailto: (b) (6)]
Sent: Monday, December 18, 2017 7:35 PM

To: Ehram, Lauren (OPA) <(b) (6)>
Cc: Hudson, Andrew (OLP) <(b) (6)>
Subject: Re: Comment for story about forensic science for The Nation

Hi Lauren,

That works for me. Thanks for taking to the time to put the responses together.

On Mon, Dec 18, 2017 at 6:53 PM, Ehram, Lauren (OPA) <(b) (6)> wrote:

Hi Tim,

I have ready to send you an on the record response from Ted Hunt, and several on background attributed to a DOJ Spokesman. Please let me know if that works for you, and I’ll get it right over.

Thank you,
Lauren

From: Tim Requarth [mailto: (b) (6)]
Sent: Friday, December 15, 2017 2:09 PM

To: Ehram, Lauren (OPA) <(b) (6)>
Cc: Hudson, Andrew (OLP) <(b) (6)>
Subject: Re: Comment for story about forensic science for The Nation

Yes, we’ll still be able to incorporate it. Thanks,

On Fri, Dec 15, 2017 at 13:59 Ehram, Lauren (OPA) <(b) (6)> wrote:

Hi Tim,

I’m working on this, but may need until Monday. Would that still work?

Thank you!
Lauren

From: Ehram, Lauren (OPA)
Sent: Tuesday, December 12, 2017 5:09 PM

To: 'Tim Requarth' <[REDACTED] (b) (6)>

Cc: Hudson, Andrew (OLP) <[REDACTED] (b) (6)>

Subject: RE: Comment for story about forensic science for The Nation

Hi Tim,

Thank you for checking in. We will be in touch before your deadline.

Thank you,
Lauren

From: Tim Requarth [mailto:[REDACTED] (b) (6)]

Sent: Monday, December 11, 2017 11:06 AM

To: Ehsam, Lauren (OPA) <[REDACTED] (b) (6)>

Cc: Hudson, Andrew (OLP) <[REDACTED] (b) (6)>

Subject: Re: Comment for story about forensic science for The Nation

Hi Lauren,

Checking in on this request again. My deadline is at the end of this week. Thanks!

On Mon, Dec 4, 2017 at 5:23 PM, Tim Requarth <[REDACTED] (b) (6)> wrote:

Hi Lauren,

Just wanted to check in on this. Thanks,

On Mon, Nov 27, 2017 at 09:43 Tim Requarth <[REDACTED] (b) (6)> wrote:

Hi Lauren,

Please find my questions below. First a little preamble: There have been a many recent criticisms from scientific groups and the mainstream media of forensic science methods, but the conversation around forensic science seems to be rife with misunderstandings. My purpose in reaching out to Mr. Hunt is to give him the opportunity to respond directly to those criticisms as head of the new Forensic Science Working Group. In the course of hearing how he would respond to some of these concerns, I'd like to better understand how he thinks about possible reforms.

Duplicative Material see bates stamp 20220314-11071 to 20220314-11074

1. At [NCFS Meeting #9](#) [NCFS meeting #9, page 11], Ted Hunt lodged one of two "no" votes against dropping the phrase "reasonable degree of scientific certainty" from forensic testimony, which was passed by NCFS and later adopted by DOJ. Why did he vote against dropping phrase "reasonable degree of scientific certainty"? Are forensic experts working for the DOJ using that phrase now?

(b)(5)

2. Previously, you stated (attributable to OPA): "This past August, the Deputy Attorney General announced that the Department would continue its work to finalize the ULTRs. These discipline-specific documents will direct Department examiners to use designated terminology and testimonial conclusions that will accurately convey the results of forensic tests and analyses." Does Ted Hunt currently support ULTRs dropping the phrase "reasonable degree of scientific certainty" from forensic testimony? Will the DOJ encourage/support language in ULTRs dropping that phrase?

(b)(5)

3. When we asked about bitemarks previously, the response (attributable to OPA) was: "The Department does not perform bitemark analysis, and we are unaware of bitemark analysis being performed inside any state, local, or federal forensic science laboratory." Regardless of whether the DOJ hires forensic examiners to examine bitemarks, Ted Hunt recently made comments to effect that he believes the technique is potentially valid. We have heard from multiple sources that at the Oct 10, 2017 meeting of the NAS Committee on Science, Technology & the Law, Mr. Hunt said with regards to bitemarks that the "jury was still out." Given that there have been multiple exonerations in cases that relied on bitemark testimony, the Texas Forensic Science Commission has [called for a moratorium](#) on the technique, the [ABFO has told its dentists](#) not to testify they can make a match, and many studies show examiners can't reliably use bitemarks for identification. It seems uncontroversial to say that the technique for specific identifications is not valid. What led Ted Hunt to draw the conclusion that "the jury is still out"? Would Mr. Hunt confirm that he made remarks along those lines? Would he like to offer any response?

(b)(5)

4. We have also heard from multiple sources that at that same Oct 10 NAS meeting a scientist in the audience, Dr. Susan Silbey challenged Mr. Hunt's comment that what constitutes scientific validation of a method is a "difference of opinion," and she suggested Mr. Hunt did not appear have a firm understanding of scientific methodology. We are going to report this exchange. Would Mr. Hunt like to respond?

(b)(5)

(b)(5)

5. At a meeting of the Judicial Conference of the United States Committee on Rules of Evidence on Oct 27, 2017, Mr. Hunt described PCAST's approach to scientific validity as "wrong and ill-advised," and at the Oct 10 meeting, described PCAST's definition of science as "narrow." This suggests that Mr. Hunt either does not understand basic scientific methodology or disagrees that the standards of basic scientific methodology that would apply to empirically validating subjective methods in any other scientific field do not apply to the forensic pattern-matching disciplines. Could he clarify his statement and/or position?

(b)(5)

FW: APPROVAL: Forensics Inquiry from The Nation

From: "Ehrsam, Lauren (OPA)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Mon, 18 Dec 2017 16:08:49 -0500

Hey there! Just want to confirm this? I know that it's your words, but just in case it should be hundreds

From: Terwilliger, Zachary (ODAG)
Sent: Monday, December 18, 2017 4:03 PM
To: Ehrsam, Lauren (OPA) <(b) (6)>
Cc: Prior, Ian (OPA) <(b) (6)>; Sarah Isgur (OPA) <(b) (6)>; Parker, Rachel (OASG) <(b) (6)>
Subject: Forensics Inquiry from The Nation

Lauren,
Obviously this is extremely dense. Has Ted reviewed and signed off on all of this? If not, please run it all by him. Regarding the "thousands" - just want to confirm we actually do have thousands not hundreds of folks in the forensics labs.

I trust those who put this together, but I want to make sure our subject matter experts have signed off and agree.

Zach

On Dec 18, 2017, at 3:45 PM, Ehrsam, Lauren (OPA) <(b) (6)> wrote:

Zach,

Below are answers to a forensics inquiry from the Nation. There is an on the record answer from Ted Hunt included, and the rest should be accepted per our negotiated terms on background attributable to a DOJ spokesperson. The deadline is today.

Please let me know your thoughts.

Lauren

1. In response to the 2016 PCAST report on forensic science, the DOJ said it would "not be adopting the recommendations related to the admissibility of forensic science evidence." As head of the new Forensic Science Working Group will you continue support this policy, and/or how will you address the fact that multiple scientific bodies (PCAST, NRC, AAAS), have concluded that many forensic methods -- including latent fingerprint, olmarks, and bitemarks -- either lack scientific validity or have not yet been scientifically validated?

(b)(5)

2. The 2009 NAS report suggested that the DOJ should not be the home of forensic science reform, even if advised by outside stakeholders, citing a strong potential for bias, despite well-meaning intentions. How would you respond to this?

(b)(5)

3. DOJ press release dated August 7, 2017 states: "The Department stands with the forensic science community and against efforts by some to reject reliable and admissible forensic evidence." What is the DOJ's definition of "reliable" and how is it determined?

(b)(5)

4. Given the DOJ's statement that it "stands with the forensic science community" what steps will the Forensic Science Working Group take to ensure that it will consider potential criticisms of forensic theories or

practices -- which may or may not undermine entire fields of forensic science (CBLA is one past example) -- in an unbiased manner?

(b)(5)

5. Given the adversarial nature of the American justice system and your experience as a prosecutor, what factors do you think might lead prosecutors to resist attempts to limit the types of forensic evidence admissible in court and/or attempts to soften the language of certainty allowed in forensic testimony? What factors might encourage prosecutors to support such reforms?

(b)(5)

6. The NCFS proposed a "Statistical Statements in Forensic Testimony," which you ultimately voted against. At NCFS meeting #13 (April 2017), you remarked that you were concerned the statistical views document would suggest a fingerprint examiner or toolmark examiner should not be able to say "I have identified this known print to this questioned print...that a firearms examiner shouldn't be allowed to say that this shell casing was fire from this gun." Some forensic experts, along with respected scientists, have said that scientific evidence does not support such "absolute" or even "practical" claims of a match. Rather, they state that examiners giving testimony in court should present the chances that their assessment could be right/wrong, based on sources of potential error or uncertainty in their field. For fields where reliable numbers are not available, the suggestion is that forensic expert witnesses indicate an absence of studies. Why do you oppose adding that language to testimony?

(b)(5)

7. The Jan 2017 issue of the United States Attorneys' Bulletin states: "In April 2015, FBI, IP, and NACDL issued a joint press release in which the FBI acknowledged that at least 90 percent of trial transcripts analyzed as part of the MHCA review contained erroneous statements. The FBI found that 26 of 28 FBI agent/analysts provided either testimony with erroneous statements or submitted laboratory reports with erroneous statements. The review found that the overstated forensic matches favored prosecutors in over 95 percent of the trials reviewed." How will the new Forensic Science Working Group in the DOJ improve forensic expert testimony and work to prevent biased and/or erroneous testimony that tends to favor prosecutors?

(b)(5)

Original questions:

Hi Lauren,

Please find my questions below. First a little preamble: There have been a many recent criticisms from scientific groups and the mainstream media of forensic science methods, but the conversation around forensic science seems to be rife with misunderstandings. My purpose in reaching out to Mr. Hunt is to give him the opportunity to respond directly to those criticisms as head of the new Forensic Science Working Group. In the course of hearing how he would respond to some of these concerns, I'd like to better understand how he thinks about possible reforms.

The questions below reflect the criticisms I've read in recent scientific reports (NAS, PCAST, AAAS), seen reported of other media outlets, and heard repeated by forensic experts, lawyers, and scientists in the course of my own reporting.

Thank you again for taking the time to look over these, and for considering an interview with Mr. Hunt.

1. In response to the 2016 PCAST report on forensic science, the DOJ said it would "not be adopting the recommendations related to the admissibility of forensic science evidence." As head of the new Forensic Science Working Group will you continue support this policy, and/or how will you address the fact that multiple scientific bodies (PCAST, NRC, AAAS), have concluded that many forensic methods -- including latent fingerprint, firearms/toolmarks, and bitemarks -- either lack scientific validity or have not yet been scientifically validated?
2. The 2009 NAS report suggested that the DOJ should not be the home of forensic science reform, even if advised by outside stakeholders, citing a strong potential for bias, despite well-meaning intentions. How would you respond to this?

3. A DOJ press release dated August 7, 2017 states: "The Department stands with the forensic science community and against efforts by some to reject reliable and admissible forensic evidence" What is the DOJ's definition of "reliable" and how is it determined?
- 4 Given the DOJ's statement that it "stands with the forensic science community" what steps will the Forensic Science Working Group take to ensure that it will consider potential criticisms of forensic theories or practices which may or may not undermine entire fields of forensic science (CBLA is one past example) in an unbiased manner?
- 5 Given the adversarial nature of the American justice system and your experience as a prosecutor, what factors do you think might lead prosecutors to resist attempts to limit the types of forensic evidence admissible in court and/or a empts to soften the language of certainty allowed in forensic testimony? What factors might encourage prosecutors to support such reforms?
- 6 The NCFS proposed a "Statistical Statements in Forensic Testimony," which you ultimately voted against At NCFS meeting #13 (April 2017), you remarked that you were concerned the statistical views document would suggest a fingerprint examiner or toolmark examiner should not be able to say "I have identified this known print to this questioned print...that a firearms examiner shouldn't be allowed to say that this shell casing was fire from this gun" Some forensic experts, along with respected scientists, have said that scientific evidence does not support such "absolute" or even "practical" claims of a match. Rather, they state that examiners giving testimony in court should present the chances that their assessment could be right/wrong, based on sources of potential error or uncertainty in their field. For fields where reliable numbers are not available, the suggestion is that forensic expert witnesses indicate an absence of studies Why do you oppose adding that language to testimony?
- 7 The Jan 2017 issue of the United States Attorneys' Bulletin states "In April 2015, FBI, IP, and NACDL issued a joint press release in which the FBI acknowledged that at least 90 percent of trial transcripts analyzed as part of the MHCA review contained erroneous statements The FBI found that 26 of 28 FBI agent/analysts provided either testimony with erroneous statements or submitted laboratory reports with erroneous statements The review found that the overstated forensic matches favored prosecutors in over 95 percent of the trials reviewed." How will the new Forensic Science Working Group in the DOJ improve forensic expert testimony and work to prevent biased and/or erroneous testimony that tends to favor prosecutors?

Nation Questions

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Ehram, Lauren (OPA)" <(b) (6)>
Date: Tue, 23 Jan 2018 19:04:59 -0500
Attachment Re pon e to The Nation Que tion doc (16 26 kB)

Lauren,

A short response is attached. I'll be at a meeting all morning tomorrow, but can talk through some of this in the afternoon if it helps. More on these topics will be coming out soon in different forums.

Ted

Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave. NW
C 20530

(b) (6)
(b) (6)

1. At [NCFS Meeting #9](#) [NCFS meeting #9, page 11], Ted Hunt lodged one of two "no" votes against dropping the phrase "reasonable degree of scientific certainty" from forensic testimony, which was passed by NCFS and later adopted by DOJ. Why did he vote against dropping phrase "reasonable degree of scientific certainty"? Are forensic experts working for the DOJ using that phrase now?

(b)(5)

2. Previously, you stated (attributable to OPA): "This past August, the Deputy Attorney General announced that the Department would continue its work to finalize the ULTRs. These discipline-specific documents will direct Department examiners to use designated terminology and testimonial conclusions that will accurately convey the results of forensic tests and analyses." Does Ted Hunt currently support ULTRs dropping the phrase "reasonable degree of scientific certainty" from forensic testimony? Will the DOJ encourage/support language in ULTRs dropping that phrase?

(b)(5)

3. When we asked about bitemarks previously, the response (attributable to OPA) was: "The Department does not perform bitemark analysis, and we are unaware of bitemark analysis being performed inside any state, local, or federal forensic science laboratory." Regardless of whether the DOJ hires forensic examiners to examine bitemarks, Ted Hunt recently made comments to effect that he believes the technique is potentially valid. We have heard from multiple sources that at the Oct 10, 2017 meeting of the NAS Committee on Science, Technology & the Law, Mr. Hunt said with regards to bitemarks that the "jury was still out." Given that there have been multiple exonerations in cases that relied on bitemark testimony, the Texas Forensic Science Commission has [called for a moratorium](#) on the technique, the [ABFO has told its dentists](#) not to testify they can make a match, and many studies show examiners can't reliably use bitemarks for identification. It seems uncontroversial to say that the technique for specific identifications is not valid. What led Ted Hunt to draw the conclusion that "the jury is still out"? Would Mr. Hunt confirm that he made remarks along those lines? Would he like to offer any response?

(b)(5)

4. We have also heard from multiple sources that at that same Oct 10 NAS meeting a scientist in the audience, Dr. Susan Silbey challenged Mr. Hunt's comment that what constitutes scientific validation of a method is a "difference of opinion," and she suggested Mr. Hunt did not appear have a firm understanding of scientific methodology. We are going to report this exchange. Would Mr. Hunt like to respond?

(b)(5)

5. At a meeting of the Judicial Conference of the United States Committee on Rules of Evidence on Oct 27, 2017, Mr. Hunt described PCAST's approach to scientific validity as "wrong and ill-advised," and at the Oct 10 meeting, described PCAST's definition of science as "narrow." This suggests that Mr. Hunt either does not understand basic scientific methodology or disagrees that the standards of basic scientific methodology that would apply to empirically validating subjective methods in any other scientific field do not apply to the forensic pattern-matching disciplines. Could he clarify his statement and/or position?

(b)(5)

RE: Comment for story about forensic science for The Nation

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Ehrsam, Lauren (OPA)" <(b) (6)>
Cc: "Hudson, Andrew (OLP)" <(b) (6)>
Date: Tue, 28 Nov 2017 18:29:43 -0500

Thanks, Lauren. I'll take a look, put potential responses together, and work with you on the appropriate extent of our comments.

Ted

From: Ehrsam, Lauren (OPA)
Sent: Tuesday, November 28, 2017 5:58 PM
To: Hunt, Ted (ODAG) <(b) (6)>
Cc: Hudson, Andrew (O <(b) (6)>
Subject: FW: Comment for story about forensic science for The Nation

Duplicative Material see bates stamp 20220314-11071

RE: Comment for story about forensic science for The Nation

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Antell, Kira M. (OLP)" <(b) (6)>
Date: Wed, 29 Nov 2017 09:08:30 -0500

OK Give me a call when you have a second

From: Antell, Kira M. (OLP)
Sent: Wednesday, November 29, 2017 8:09 AM
To: Hunt, Ted (ODAG) <(b) (6)>
Subject: RE: Comment for story about forensic science for The Nation

I have thoughts.

From: Hunt, Ted (ODAG)
Sent: Tuesday, November 28, 2017 6:30 PM
To: Antell, Kira M. (OLP) <(b) (6)>
Subject: FW: Comment for story about forensic science for The Nation

FYI. Take a look and we can discuss this tomorrow.

Thx.

Ted

From: Ehram, Lauren (OPA)
Sent: Tuesday, November 28, 2017 5:58 PM
To: Hunt, Ted (ODAG) <(b) (6)>
Cc: Hudson, Andrew (OLP) <(b) (6)>
Subject: FW: Comment for story about forensic science for The Nation

Duplicative Material see bates stamp 20220314-11071

FW: Forensics letters

From: "Antell, Kira M. (OLP)" <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Tue, 10 Oct 2017 11:18:10 -0400
Attachment 2017 8 25 National Commission on Forensic Science (NCFS) Johnson.pdf (473 kB); 2017 8 25 National Commission on Forensic Science (NCFS) - Blumenthal #3....pdf (483.54 kB); 2017-7-6 forensic pathologist (FP) shortage - Schumer #3865381.pdf (1.14 MB); 2017-6-9 National Commission on Forensic Science (NCFS) - Blumenthal #38....pdf (129.56 kB); DOJ-LA-2017-0006-0235.pdf (12.96 kB)

FYSA

From: Pickell, Lindsay A. (OLA)
Sent: Tuesday, October 10, 2017 11:17 AM
To: Antell, Kira M. (OLP) <(b) (6)>
Subject: Forensics letters

Kira attached are the letters and their responses we have received on forensics that our front office could find. The response to Schumer's letter is still going through the process here.

Thanks,
Lindsay



U.S. Department of Justice

Office of Legislative Affairs

Office of the Assistant Attorney General

Washington, D.C. 20530

AUG 25 2017

The Honorable Eddie Bernice Johnson
U.S. House of Representatives
Washington, DC 20515

Dear Congresswoman Johnson:

This responds to your comments submission to the Attorney General dated June 9, 2017, regarding the Department of Justice's (the Department) plans for forensic science following the expiration of the National Commission on Forensic Science (NCFS). The interests of justice require prompt access to reliable forensic evidence for solving crimes, identifying wrongdoers, and clearing the innocent. The Attorney General remains committed to that goal.

In the months ahead, the Department plans to focus on three areas: (1) facilitating coordination and collaboration on forensic science within the Department, across the federal government, and with our state, local, and tribal partners; (2) increasing the capacity of forensic service providers so that evidence can be processed more quickly; and (3) improving the reliability of forensic analysis and testimony.

As part of this effort, the Department recently issued a Federal Register Notice seeking public input on these issues. The Department received more than 250 comments from a diverse array of people and organizations. We appreciate the time and energy that went into them, and we are especially grateful for the engagement by members of Congress. We are reviewing these comments now. In addition, the NCFS has made several final recommendations to the Department, which we are also reviewing.

While these reviews continue, the Department has announced several specific actions that will advance forensic science and ensure that the Department's forensic testimony is consistent with scientific principles and just outcomes. To that end, the Department will develop Uniform Language for Testimony and Reports to help guide examiner testimony and, for quality assurance, will develop and implement a new Department-wide testimony monitoring program. The Attorney General has appointed former NCFS commissioner Ted Hunt as the Department's Senior Advisor on Forensics to oversee these projects.

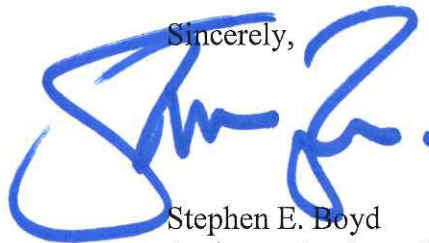
The Honorable Eddie Bernice Johnson
Page Two

As you noted, the Commission brought together many important stakeholders, including federal, state, and local law enforcement officials, forensic scientists and practitioners, academics, prosecutors, defense attorneys, judges, crime victims, and members of the public. We applaud the professionalism of the NCFS and look forward to building on the contributions they have made in this crucial field.

The Department is committed to hearing from all of those with an interest in forensic science, and we look forward to working with you and other members of Congress on this important subject.

We hope this information is helpful. Please do not hesitate to contact this office if we may provide additional assistance regarding this or any other matter.

Sincerely,



Stephen E. Boyd
Assistant Attorney General

cc: Dr. Kent Rochford
Acting Under Secretary of Commerce
for Standards and Technology
Acting Director of the National Institute
of Standards and Technology



U.S. Department of Justice

Office of Legislative Affairs

Office of the Assistant Attorney General

Washington, D.C. 20530

AUG 25 2017

The Honorable Richard Blumenthal
United States Senate
Washington, DC 20510

The Honorable Cory A. Booker
United States Senate
Washington, DC 20510

Dear Senator Blumenthal and Senator Booker:

This responds to your letter to the Attorney General dated June 9, 2017, regarding the Department of Justice's (the Department) plans for forensic science following the expiration of the National Commission on Forensic Science (NCFS). The interests of justice require prompt access to reliable forensic evidence for solving crimes, identifying wrongdoers, and clearing the innocent. The Attorney General remains committed to that goal.

In the months ahead, the Department plans to focus on three areas: (1) facilitating coordination and collaboration on forensic science within the Department, across the federal government, and with our state, local, and tribal partners; (2) increasing the capacity of forensic service providers so that evidence can be processed more quickly; and (3) improving the reliability of forensic analysis and testimony.

As part of this effort, the Department recently issued a Federal Register Notice seeking public input on these issues. The Department received more than 250 comments from a diverse array of people and organizations. We appreciate the time and energy that went into them, and we are especially grateful for the engagement by members of Congress. We are reviewing these comments now. In addition, the NCFS has made several final recommendations to the Department, which we are also reviewing.

While these reviews continue, the Department has announced several specific actions that will advance forensic science and ensure that the Department's forensic testimony is consistent with scientific principles and just outcomes. To that end, the Department will develop Uniform Language for Testimony and Reports to help guide examiner testimony and, for quality assurance, will develop and implement a new Department-wide testimony monitoring program. The Attorney General has appointed former NCFS commissioner Ted Hunt as the Department's Senior Advisor on Forensics to oversee these projects.

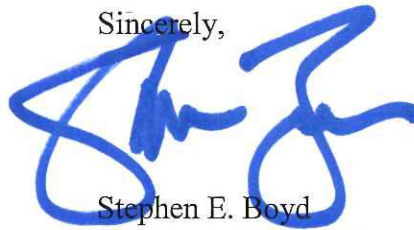
The Honorable Richard Blumenthal
The Honorable Cory A. Booker
Page Two

As you noted, the Commission brought together many important stakeholders, including federal, state, and local law enforcement officials, forensic scientists and practitioners, academics, prosecutors, defense attorneys, judges, crime victims, and members of the public. We applaud the professionalism of the NCFS and look forward to building on the contributions they have made in this crucial field.

The Department is committed to hearing from all of those with an interest in forensic science, and we look forward to working with you and other members of Congress on this important subject.

We hope this information is helpful. Please do not hesitate to contact this office if we may provide additional assistance regarding this or any other matter.

Sincerely,



Stephen E. Boyd
Assistant Attorney General

cc: Dr. Kent Rochford
Acting Under Secretary of Commerce
for Standards and Technology
Acting Director of the National Institute
of Standards and Technology

United States Senate

WASHINGTON, DC 20510

July 6, 2017

RECEIVED
DEPT. OF JUSTICE
EXECUTIVE SECRETARIAT
2017 JUL 25 PM 12:16

The Honorable Jeff Sessions
Attorney General
U.S. Department of Justice
950 Pennsylvania Avenue, NW
Washington, DC 20530

Dear Attorney General Sessions:

As the Department of Justice's Task Force on Crime Reduction and Public Safety develops a strategy to advance national forensic science standards and operations, I encourage you to give particular consideration to the forensic pathologist (FP) shortage facing communities nationwide. In doing so, I request that you take steps that could immediately close the gap and incentivize more interest in this critical field. Specifically, I urge you to enact a number of recommendations previously published by the National Commission on Forensic Science.

As you know, the widespread uptick of illicit opioid and prescription drug abuse has presented grave new challenges to local communities. The rise in fatal drug-related overdoses has overwhelmed medical examiner (ME) offices across the country, many of whom are on the front lines of battling the growing caseload of autopsies fueled by the opioid epidemic. Some estimates report that the nation has less than half the number of FPs it needs. Furthermore, only 30 to 40 doctors complete forensic pathology training annually. Of those, few go into full-time forensic pathology practice.

As workloads increase, ME offices across the country face limitations that raise their costs while threatening their accreditations. According to the national accrediting association, MEs are recommended to perform no more than 250 autopsies a year in order to minimize risk of error. As a result, ME offices that are close to surpassing the limit are forced to contract outside pathologists in order to keep caseloads within the guidelines and maintain accreditation. This shortage has been particularly damaging to Monroe County in Upstate New York, where the Monroe County Office of the Medical Examiner, which provides forensic death investigations and autopsy services to thirteen counties in central and western New York, is working diligently to attract and recruit full-time FPs to fill three of their four vacant positions. While Monroe County is exhausting all the resources at its disposal to recruit full-time FPs, including adding one new hire at the beginning of this month, the FP shortage is a national issue and requires a national response.

With the rate of opioid overdose deaths expected to grow, the need for adequate MEs is more important now than ever. The National Commission on Forensic Science recently considered this issue and offered a number of fruitful recommendations that could help to combat this growing shortage. First, the Commission recommended the creation of a new grant to support a fellowship program between universities and local MEs, a step that could encourage interest in

the field and create a new pipeline of FPs to help shoulder the increasing workload of understaffed ME offices. Secondly, the Commission recommended that university medical schools add forensic pathology in the medical school curriculum within the first 2 years as this is a prime time to attract future FPs, followed by elective rotations in forensic pathology in later years. Put together, these recommendations could have a worthwhile impact to reverse the nationwide shortage, and I strongly urge you to implement them as part of your mission to update national forensic science initiatives.

In addition to implementing these recommendations, I also ask you to help support a new innovative Forensic Pathology Fellowship program that Monroe County has now begun to develop with the University of Rochester School of Medicine and Dentistry. This new Fellowship program would be only the second of its kind in New York and is representative of exactly the type of new Fellowship programs envisioned and recommended by the National Commission on Forensic Science for national support from the Department of Justice. Costs associated with the training and support of the FP Fellows during their time working in an ME office could be supported by new DOJ grant programs while ME offices would receive the benefit of a new pipeline of trained forensic pathologists.

It is essential that our local counties have the tools necessary to perform toxicology testing, determine causes of death, and issue timely reports. These reports are often integral to determining unknown causes of deaths, facilitating police investigations, and providing the information necessary to properly diagnose this raging epidemic. If the federal government fails to provide the targeted investments needed to address the growing shortage of forensic pathologists, communities will be left without the vital resources that are necessary to confront this growing crisis.

Thank you for taking the time to consider this request. I look forward to hearing from you.

Sincerely,



Charles E. Schumer
United States Senator

United States Senate

WASHINGTON, DC 20510

June 9, 2017

The Honorable Jefferson B. Sessions III
United States Attorney General
U.S. Department of Justice
Robert F. Kennedy Building
950 Pennsylvania Avenue Northwest
Washington, DC 20530

Dear Attorney General Sessions:

We write in response to the Department of Justice's ("the Department") request for comments on how the Department ought to proceed in improving the science underlying forensic science, following your decision to allow the National Commission on Forensic Science ("the Commission") to expire at the end of April (Docket No. OLP 160). We believe allowing this federal advisory committee to expire was a mistake, and that there is a very easy and simple answer as to how the Department ought to proceed; the Department ought to renew the Commission's charter.

Since its first meeting in February 2014, the Commission has worked diligently to help restore science to the forensic sciences. For too long, the use of forensic science disciplines with questionable scientific validity in the courtroom has gone unchecked. As a joint partnership between the Department of Justice and the National Institute of Standards and Technology, the Commission has been successful at convening the full range of stakeholders involved: federal, state and local forensic science labs and practitioners, research scientists and academics, law enforcement officials, prosecutors, defense attorneys, judges, victim advocates, and the public.

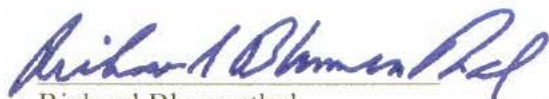
In its short time, the Commission has proven itself an effective framework for issuing thoughtful recommendations toward its mission to "enhance the practice and improve the reliability of forensic science." Over the course of two years, it has developed a total of 43 work products. However, there is still a lot of work to do. The Commission's final report on April 11, 2017 details a laundry list of questions not yet answered, and guidance and standards not yet written. As described in this final report, the Commission was working toward guidance on evidence preservation and retention, recommendations on how to improve training of users of forensic science (i.e. law enforcement, judges, lawyers, and the public), and new standards to increase accuracy and reliability in the application of forensic science, among many other critical goals. Had the Commission been allowed to fulfill its mission to completion, these work products would have been enormously helpful for state and local law enforcement similarly committed to increasing the accuracy and reliability of their use of forensic science. The Commission's termination leaves a significant void.

RECEIVED
DEPT OF JUSTICE
EXECUTIVE SECRETARIAT
2017 JUN 21 PM 12:35

Furthermore, in recent years, we have learned that a number of forensic disciplines have questionable scientific validity. More than a quarter of wrongful convictions later overturned by DNA testing involved expert testimony based on questionable forensic evidence, including bite mark, shoe print, and fire pattern analysis. It is critical to the integrity of our criminal justice system that we vigorously pursue all efforts to identify forensic science disciplines that may yield flawed or unreliable evidence, and that we learn from and correct any past mistakes. This is exactly what the Commission was assembled to do, and this task is far from complete. Science and technology are constantly evolving, so it is vital that the courts, law enforcement, forensic science, and research communities work efficiently together to assess the scientific state of those disciplines so that we can ensure that forensic evidence used in the courtroom is scientifically valid and reliable.

As you contemplate how the Department should move forward, we urge you to reconsider this very serious step backward in building trust and faith in our criminal justice system, and assuring justice is served by good science. Devoting resources today to promote scientifically valid and accurate forensic science will only make our justice system stronger and our country safer. Preserving the Commission will move us toward a stronger, fairer system that provides true justice to victims of crime.

Sincerely,



Richard Blumenthal
UNITED STATES SENATE



Cory A. Booker
UNITED STATES SENATE

CC:

Deputy Attorney General Rod Rosenstein

Dr. Kent Rochford

Acting Under Secretary of Commerce for Standards and Technology
Acting Director of the National Institute of Standards and Technology
100 Bureau Drive
Gaithersburg, MD 20899

PUBLIC SUBMISSION

As of: June 12, 2017
Received: June 09, 2017
Status: Posted
Posted: June 12, 2017
Tracking No. 1k1-8wv5-52iv
Comments Due: June 09, 2017
Submission Type: Web

Docket: DOJ-LA-2017-0006

Notice of Public Comment Period on Advancing Forensic Science

Comment On: DOJ-LA-2017-0006-0001

Notice of Public Comment Period on Advancing Forensic Science

Document: DOJ-LA-2017-0006-0235

Comment on FR Doc # 2017-07512

Submitter Information

Name: Eddie Bernice Johnson

General Comment

As Ranking Member of the House Committee on Science, Space, and Technology, I urge you to reconsider your decision to disband the National Commission on Forensic Science. In addition to my committee leadership position, I am a proud representative of the great state of Texas. Unfortunately, over the past decade, Texas has seen many high-profile forensic lab failures, including poor science and fabricated results. According to data from the National Registry of Exonerations, of the 302 Texans who have been exonerated of their crimes, 142 - nearly half - were convicted at least in part based on false or misleading forensic evidence. When an innocent person is sent to prison, not only is that individual and his or her family's lives forever harmed, but the true guilty individual continues to walk the streets. Nationwide, from just one small study of 172 exonerees, the real perpetrators who were later identified went on to commit an additional 149 violent crimes, including 77 sexual assaults and 35 murders. Strengthening forensic science and standards can save countless innocent lives and ensure that criminals are appropriately prosecuted.

For some areas of forensic evidence, such as DNA and fingerprint analysis, foundationally valid methodology is available; however, there is more work to be done - both on the science and in ensuring that uniform standards are adopted and enforced in crime labs and courtrooms across the country. In too many other forensic fields, such as bite mark and footwear analysis, there is little to no scientific basis for the claims made in court to prosecute defendants. A full accounting of the state of forensic evidence - both the science and the practice - are described in detail in reports by The National Academies and the President's Council of Advisors on Science and Technology.

The National Commission on Forensic Science brought together forensic practitioners, academic scientists, defense lawyers, prosecutors, judges, the federal government, and other critical stakeholders and experts to collectively develop guidelines and recommendations to improve the practice and reliability of forensic science. It served a complementary role to the Organization of Scientific Area Committees managed by the National Institute of Standards and Technology. Forensic scientists, lawyers, and judges across the country are begging for better guidelines and standards for forensic evidence. DOJ is well placed to help support the development of those guidelines. The Commission was making progress, but it needs more time to carry out its mission. These

are not simple challenges with simple answers. Provided that the Commission can continue to operate with independence and with its original mission and purpose intact, it can continue to serve an important role in improving the underlying science of forensic evidence introduced in courtrooms across the nation.

Budowle PCAST

From: Ted Hunt <(b) (6)>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Sat, 30 Sep 2017 17:52:27 -0400
Attachment Budowle Re pon e to PCAST Report 06 17 2017 (002) pdf (618 37 kB)



June 17, 2017

To whom it may concern:

When the President's Council of Advisors on Science and Technology (PCAST) Report first was published in 2016, it was obvious that the report was not particularly helpful from a scientific perspective as it was myopic, full of error, and did not provide data to support its contentions. A more significant concern regarding the failings of the PCAST Report was that it claimed its focus was on science, but obviously was dedicated substantially to policy. Initially I considered writing a critique about the failings of the PCAST Report to assist the community. But the problems with this report were so obvious that I did not think it would be necessary to devote time to such an effort. Indeed my prediction was correct in that the report would be (and has been) rejected by the scientific community as well as overwhelmingly by the courts. However, the PCAST Report is being relied on by the Public Defender Service in U.S. v. Benito Valdez (Motion to Exclude the Testimony of the Government's proposed expert witness in Firearms Examination and Memorandum of Points and Authorities in Support, dated June 2, 2017) as a scientifically sound review of the state of the forensic sciences. Therefore, it has become necessary to address the serious limitations of the PCAST Report and convey that it is an unsound, unsubstantiated, non-peer-reviewed document that should not be relied upon for supporting or refuting the state of the forensic sciences.

My credentials to be able to opine on the failings of the PCAST Report are based on my work of more than 30 years in research, development, validation, and implementation of DNA typing methodologies for forensic applications (my CV is attached). I received a Ph.D. in Genetics in 1979 from Virginia Polytechnic Institute and State University. From 1979-1982, I was a postdoctoral fellow at the University of Alabama at Birmingham and carried out research predominately on genetic risk factors for such diseases as insulin dependent diabetes mellitus, melanoma, and acute lymphocytic leukemia. In 1983, I joined the research unit at the FBI Laboratory Division to carry out research, development, and validation of methods for forensic biological analyses. The positions I held at the FBI include: research chemist, program manager for DNA research, Chief of the Forensic Science Research Unit, and the Senior Scientist for the Laboratory Division of the FBI. I have contributed to the fundamental sciences as they apply to forensics in analytical development, population genetics, statistical interpretation of evidence, and in quality assurance. Some of my technical efforts have been: 1) development of analytical assays for typing myriad protein genetic marker systems, 2) designing electrophoretic instrumentation, 3) developing molecular biology analytical systems to include RFLP typing of VNTR loci and PCR-based SNP, VNTR and STR assays, and direct sequencing methods for mitochondrial DNA, 4) new technologies such as use of massively parallel sequencing; and 5) designing image analysis systems. I worked on laying some of the foundations for the current

statistical analyses in forensic biology and defining the parameters of relevant population groups. I have published approximately 600 articles (more than any other scientist in the area of forensic genetics), made more than 730 presentations (many of which were as an invited speaker at national and international meetings), and testified in well over 250 criminal cases in the areas of molecular biology, population genetics, statistics, quality assurance, validation, and forensic biology. In addition, I have authored or co-authored books on molecular biology techniques, electrophoresis, protein detection, forensic genetics, and microbial forensics. I was directly involved in developing the quality assurance standards for the forensic DNA field in the United States. I have been a chair and member of the Scientific Working Group on DNA Methods, Chair of the DNA Commission of the International Society of Forensic Genetics, and a member of the DNA Advisory Board. I was one of the original architects of the CODIS National DNA database, which maintains DNA profiles from convicted felons, from evidence in unsolved cases, and from missing persons.

Some of my efforts over the last 16 years also are in counter terrorism, including identification of victims from mass disasters, microbial forensics and bioterrorism. I was an advisor to New York State in the effort to identify the victims from the WTC attack. In the area of microbial forensics, I was the chair of the Scientific Working Group on Microbial Genetics and Forensics, whose mission was to set QA guidelines, develop criteria for biologic and user databases, set criteria for a National Repository, and develop forensic genomic applications. I also have served on the Steering Committee for the Colloquium on Microbial Forensics sponsored by American Society of Microbiology, was an organizer of four Microbial Forensics Meetings held at The Banbury Center in the Cold Spring Harbor Laboratory, and participated on several steering committees for NAS sponsored meetings.

In 2009 I became Executive Director of the Institute of Applied Genetics and Professor at the University of North Texas Health Science Center at Fort Worth, Texas. I currently direct the Center for Human Identification. I also direct an active research program in the areas of human forensic identification, microbial forensics, emerging infectious disease, human microbiome, molecular biology technologies, and pharmacogenetics (or molecular autopsy). I also currently am an appointed member of the Texas Forensic Science Commission.

Of note, the PCAST Committee relied on my work and as a noted expert which is supported by the report's citation of my work several times all in a favorable manner. Indeed, I am the scientist at the FBI that is mentioned as Dr. Lander's co-author to bolster his credentials in the forensic sciences (see footnotes 17 and 20). My work is cited in footnotes 33, 149, 183, 185, 187, and 209.

The report lacks scientific substance. It is cloaked with a veneer of science but in actuality is an attempt to set policy. The report discusses and advocates validation (a topic all should agree is important). Yet the topic is only addressed superficially providing definitions that already are well known with generalizations and terms it calls criteria. Nothing novel was provided by the report (see examples in references 1-7 that already have discussed the same criteria but to a greater degree than in the report). Moreover, the report does not provide any substantial guidance on how to perform validation studies for any of the disciplines it addresses. There are basic validation criteria such as sample size, power analyses, types of samples, sensitivity, specificity, dynamic range, purity of analyte, etc. that the report does not address per se or only touches upon (and instead uses black box studies for its only endeavor into sampling uncertainty and for a

misguided attempt at addressing the potential for error). The PCAST Committee could have done a service to the community if it had selected some validation studies that it claims to have reviewed (although such claims are suspect as there is no documentation supporting the claims) and described specifically those studies that the PCAST Committee deemed inappropriate and/or inadequate. Then, the PCAST Committee could have laid out how those studies should have been performed with the real substantive criteria and examples that are necessary to perform a validation study. Leading by example would have been helpful; instead the report just dismisses most of the work performed in 2000 plus articles that it claims (sic) to have reviewed. The report criticizes the forensic community for a lack of validation studies but does not describe what is lacking in any substantive way.

The Report does not describe data from each of the disciplines that could be relied upon. It is difficult to believe that in 2000 papers, the PCAST Committee claims to have relied upon, that there are no data of value. There are no indications that the PCAST Committee actually assessed the data in the literature. There is little if any documentation in this regard which should be extremely troubling to all given the PCAST Committee's strong positions of the importance of validation, documentation, and peer-reviewed publication for the forensic science community. The PCAST Committee clearly takes a "do as I say, not as I do" position. The report contains no discussion on the criteria that were used to assess the literature, the criteria that were used to dismiss the literature as inadequate, and no documentation that any data (if existing) are readily available to support that the PCAST committee performed a sound, full and complete review. Again, these issues are most disconcerting because it is apparent that the PCAST Committee in its undertaking did not hold itself up to the same standards of validation, documentation, and peer-review that it espouses the forensic community should embrace (compounded as a number of the criticisms in the report are unfounded). The report provides some guidance on basic statistics, such as estimating false positive rates (which are not novel). However, this lecturing on proper statistics is troubling to say the least as the report misuses statistics in its own cursory efforts.

The following are examples from the report to support my above claims. They are not comprehensive as it is unnecessary to go page-by-page to indicate the serious problems with the PCAST Report. A few examples should suffice to demonstrate why this report has been so underwhelming and been ignored by most scientists and the courts. In pointing out the failings of the report I will focus on topics that transcend the disciplines and specifically on my area of expertise, i.e., DNA; I could not adequately address the other disciplines and what data do or do not exist in those forensic science areas. I leave specifics of other disciplines to those with requisite expertise. However, I stress that since the report misinforms on forensic DNA applications, which is considered the "gold standard" and well-documented in the scientific literature (even the report acknowledges that), then there is a strong indication that perhaps the report missed the mark on the other disciplines as well.

I take the position that improvements in forensic sciences are needed. Indeed, all science continues to improve. It is never static. In my field of DNA typing, I and others have been and currently are working on developing better/improved methods, such as the use of next generation sequencing and new software tools. It would be improper to say that any method is perfect and cannot be made better. That position, though, is not a wholesale condemnation of the forensic sciences. Each discipline, or better yet each application, should be assessed in context as a holistic system (not solely based on validation as the report seemingly myopically espouses) and

the types/quality of samples encountered in specific cases. The report's generalization of issues avoids addressing an extremely important question – was the analysis/interpretation in this case performed correctly?

The first two examples presented below are particularly egregious and point to the dearth of substance in the report. The report states on page 2

“In the course of its study, PCAST compiled and reviewed a set of more than 2,000 papers from various sources—including bibliographies prepared by the Subcommittee on Forensic Science of the National Science and Technology Council and the relevant Working Groups organized by the National Institute of Standards and Technology (NIST); submissions in response to PCAST's request for information from the forensic-science stakeholder community; and PCAST's own literature searches.”

On page 67 of the report it is stated

“PCAST compiled a list of 2019 papers from various sources—including bibliographies prepared by the National Science and Technology Council's Subcommittee on Forensic Science, the relevant Scientific Working Groups (predecessors to the current OSAC), and the relevant OSAC committees; submissions in response to PCAST's request for information from the forensic-science stakeholder community; and our own literature searches.”

There were two citations to support the review of the 2000 or so papers that the PCAST relied upon:

www.nist.gov/forensics/workgroups.cfm.

www.whitehouse.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensics_references.pdf.

Neither of these sites appear to show (or allow for ready identification) what those articles were that the PCAST Committee reviewed and then relied upon. More so, there are no criteria and no data in the report or at these sites on what the PCAST Committee actually read, noted, reviewed, quantified, calculated, accepted, rejected, and/or debated. The report advocates emphatically and repeatedly the virtues of validation, documentation, and peer-review. Yet the report does not contain such information and thus does not meet as a minimum the requirements that it lambasted the forensic science community for lacking. This inconsistency between recommended requirements and lack of performance by the PCAST Committee is most noted as there is substantial documentation in the forensic science community (in many disciplines) but not in this report.

This lack of documentation should be considered in light of the report's statements on pages 1 and 22

“PCAST concluded that there are two important gaps: (1) the need for clarity about the scientific standards for the validity and reliability of forensic methods and (2) the need to

evaluate specific forensic methods to determine whether they have been scientifically established to be valid and reliable.”

The report also states on pages 4 and 21

“It is the proper province of the scientific community to provide guidance concerning scientific standards for scientific validity, and it is on those *scientific* standards that PCAST focuses here.”

Yet the PCAST Committee did not provide its data to support the validity of its own work. There simply is no accounting of the PCAST Committee’s work to demonstrate it assessed the 2000 papers and how it came to the conclusions it rendered.

This evident failing is exacerbated by the reports statement on page 6

“The forensic examiner must have been shown to be *capable* of reliably applying the method and must *actually* have done so. Demonstrating that an expert is *capable* of reliably applying the method is crucial—especially for subjective methods, in which human judgment plays a central role. From a scientific standpoint, the ability to apply a method reliably can be demonstrated only through empirical testing that measures how often the expert reaches the correct answer. Determining whether an examiner has *actually* reliably applied the method requires that the procedures actually used in the case, the results obtained, and the laboratory notes be made available for scientific review by others.”

No one knows what method(s) the PCAST Committee used; but it is clear that it did not hold itself to the same standard either by *capability* or *actually* performing. This report cannot be held up for scientific review (as indicated on page 6 of the report – see immediately above). There are no notes or results available.

As the report says repeatedly (see pages 6 and 32)

“We note, finally, that neither experience, nor judgment, nor good professional practices (such as certification programs and accreditation programs, standardized protocols, proficiency testing, and codes of ethics) can substitute for actual evidence of foundational validity and reliability.”

The academic and professional standings of the PCAST Committee members are not a substitute for good practices (none of which are documented). No one should take seriously this report because it has little substance to support its contentions.

The second most egregious example is the misuse and disregard for statistics. It may appear to the casual observer that the PCAST Committee is steeped in statistics and thus all statistics presented must be meaningful. For example, the report dedicates Appendix A for some discussion on statistics. But this guidance is rather basic and not particularly helpful to guide the community for any specific discipline or application. Yet when it comes to substance the PCAST Committee fails again which is evident in its own use of statistics. Consider the statements in the report on page 3

“Reviews by the National Institute of Justice and others have found that DNA testing during the course of investigations has cleared tens of thousands of suspects and that DNA-based re-examination of past cases has led so far to the exonerations of 342 defendants. Independent reviews of these cases have revealed that many relied in part on faulty expert testimony from forensic scientists who had told juries incorrectly that similar features in a pair of samples taken from a suspect and from a crime scene (hair, bullets, bitemarks, tire or shoe treads, or other items) implicated defendants in a crime with a high degree of certainty.”

Then on page 26

“DNA-based re-examination of past cases, moreover, has led so far to the exonerations of 342 defendants, including 20 who had been sentenced to death, and to the identification of 147 real perpetrators.”

A similar statement is found on page 44 (footnote 94). These findings appear to support the assertion on page 44 of the report

“It is *important* because it has become apparent, over the past decade, that faulty forensic feature comparison has led to numerous miscarriages of justice.”

I do not dispute that there have been 342 post-conviction exonerations. I am not sure what the number of exonerations is when the report says “many relied in part on faulty expert testimony” – because the report does not quantify what is meant by many. However, one wrongful analysis or testimony is one too many, and every effort should be made to minimize forensic science errors. The exoneration of 342 convicted felons is serious and topic in its own right (and again way too many). But this number is statistically meaningless and out of context. The PCAST Committee should have recognized this obvious aspect of the use of numbers. The PCAST Committee did not perform any statistical analyses or even appear to collect the data necessary to put these numbers in proper perspective. The PCAST Committee should have identified how many cases in total that have been reviewed to date (especially given that the report discusses the proper way to calculate a false positive rate, the Committee does not follow through with the same verve). This number of 342 may be and is likely a very small percentage of the total number of cases reviewed, especially since the innocence project has been around for 25 years (see <https://25years.innocenceproject.org/>). Moreover, the PCAST Committee did not convey how many post-conviction analyses that have been performed over the past 25 years in which there was no evidence of improper scientific performance, findings or faulty testimony. It would seem that such obvious basic information eluded the PCAST Committee. Those cases that were reviewed over the past 25 years in which no misuse of forensic science analyses were detected would indicate that perhaps the forensic science field is not so scientifically corrupt as the report implies. More so it would indicate that proper results can be obtained (at least most of the time).

The report discusses error rates substantially using statements such as on page 6

“Similarly, an expert’s expression of *confidence* based on personal professional experience or expressions of *consensus* among practitioners about the accuracy of their field is no substitute for error rates estimated from relevant studies.”

The PCAST Report also recommends

“For subjective feature-comparison methods, because the individual steps are not objectively specified, the method must be evaluated as if it were a “black box.”

Smrz et al (8) (a paper of which I am a co-author) recommended the black box approach after the review of the FBI Laboratory’s latent print misidentification related to the Madrid bombing incident, and the PCAST Report advocates the use of such black box studies. I concur that a black box approach has some value but strongly caution that one must consider the proper utility of such studies. The authors of the PCAST Report calculated upper bound error rates based on the results of the very few black box studies they discuss; the PCAST Committee seemingly implies that these upper bound error rates are somehow meaningful to report in every case analysis. A black box study can demonstrate generally whether or not a method can yield reliable results where a human is substantially involved in the interpretation of results. But it does not necessarily help address error that may or may not have occurred during a specific case analysis.

There are several problems with such a simplistic generalization that the authors of the PCAST Report have taken regarding use of black box studies. A black box study only tests those individuals involved in the study. Therefore, the performance of the rest of the analysts of the forensic science community is not covered by the study, and the results of the study may not apply to those analysts. Some individuals perform better than others in black box studies. The average rate inflates the performance of the poorer analysts and deflates the performance of the better analysts tested in the study. Therefore, the error rate values calculated by the PCAST authors likely do not apply to most analysts. Moreover, the information content and quality of results from a forensic science analysis vary from sample to sample. Treating all sample results equally and applying a single error rate does not convey the chance for error in a particular analysis. As the PCAST Report states (see below) DNA mixture interpretation is more challenging than interpretation of single source DNA profiles. If the PCAST Committee recognizes that differences in the quality of DNA evidence affect difficulty of interpretation, then the PCAST Committee should have been able to realize that the same holds for black box study results and different quality evidence (another obvious inconsistency in the report).

A known error rate or proficiency test mistake is at best some indirect measure of the verity of the proposed results in any given sample analysis, but can never be a direct measure of the reliability of the specific result(s) in question (9). Consider a hypothetical crossing of a street where there is a 1% error (arbitrary for sake of discussion) of being hit by a car. At the beginning of the journey crossing the road there is a 1% error of being hit. While crossing the road the chance can increase or decrease depending on circumstances (possibly being greater at the center of the road and less within lanes). If the individual successfully crosses the road, then the error drops to zero. Of course, different roads (such as a busy interstate vs a rural back road) have different *a priori* chances of error (i.e., similar to the quality of evidence affects the degree of difficulty). Ultimately the issue of crossing the road is did the individual successfully cross the road or get hit. The same holds for casework, i.e., is there an error or is there not an error in the performance or analysis. Given that the black box studies mentioned in the report did have a good degree of success, there is support that a process can generate a reliable result. Thus it still comes back to determining if an error of consequence was committed in a specific case. Oddly not mentioned in the PCAST Report is that most of the forensic disciplines addressed carry out non-consumptive forms of examination. Therefore, the most direct way to measure the truth of

the purported results is to have another expert conduct his/her own review, as is advocated by the National Research Council Report II for DNA analyses (10). Re-analysis would be more meaningful instead of espousing hypothetical error rates, which may not apply to the actual results and/or analysts involved. Indeed, the above mentioned black box studies and the missing data on total number of cases from innocence project case reviews do support that tests can yield reliable results but that most of the problems (as discussed below for DNA mixtures) have been due to misapplication. Therefore, case peer-review can be an effective approach to identify misapplications. However, the PCAST Report seems to ignore the value of this practice which demonstrates the reports myopic assessment of the forensic sciences and lack of consideration of a holistic systems approach.

The PCAST Report singles out validation as essentially the sole basis for reliability. Instead under a systems approach there are several components that impact an outcome, and the reliance on these several features increases validity and reliability in any one case. Quality performance is an essential component for obtaining reliable results and for reducing the chance of error. Quality assurance provides an infrastructure to promote high performance, address errors that arise, and improve processes. In addition to validation studies, there are other mechanisms such as technical review of a case that reduce error. This technical review is performed within the laboratory before issuing a report and also outside the laboratory when an expert witness is acquired by the opposing side to assess results and interpretations. The PCAST Report seems to ignore the value of these additional quality measures and the strength of the adversary system. Error rates are difficult to calculate; they are fluid. When an error of consequence (i.e., a false “match”) occurs, under a sound quality assurance program corrective action is taken (to include review of cases analyzed by the examiner prior to and post the discovery of the error). When the corrective action is such that the individual will no longer commit that error, it no longer impacts negatively on the individual’s future performance. In fact, he/she is better educated and less likely to err. The calculation of a current error rate then should not include past error(s). Having said that, past error should not be ignored; if desired, it could be raised in court or other deliberations. The defense (or prosecution), if it believes it useful, should make use of such information during a cross-examination of an expert. But the PCAST Report does not address the shortcomings of the calculated error rate as it uses it; it treats the upper bound error rate calculation from black box studies as if they are robust and specific (which they are not).

Notably the PCAST Report tends to dismiss experience and judgment, implying it has little value. I agree that experience and judgment standing alone should be considered with caution. However, the vast majority of forensic science disciplines work in a systems approach, i.e., many facets to the process; experience is but one factor among several to effect a quality result. Even though the PCAST Report dismisses experience it again shows its inconsistencies about the province of experience. Consider the following statements on page 55 of the report

“In some settings, an expert may be scientifically capable of rendering judgments based primarily on his or her “experience” and “judgment.” Based on experience, a surgeon might be scientifically qualified to offer a judgment about whether another doctor acted appropriately in the operating theater or a psychiatrist might be scientifically qualified to offer a judgment about whether a defendant is mentally competent to assist in his or her defense.”

“By contrast, “experience” or “judgment” cannot be used to establish the scientific validity and reliability of a metrological method, such as a forensic feature-comparison method. The frequency with which a particular pattern or set of features will be observed in different samples, which is an essential element in drawing conclusions, is not a matter of “judgment.” It is an empirical matter for which only empirical evidence is relevant. Moreover, a forensic examiner’s “experience” from extensive casework is not informative—because the “right answers” are not typically known in casework and thus examiners cannot accurately know how often they erroneously declare matches and cannot readily hone their accuracy by learning from their mistakes in the course of casework.”

Even to a lay person these statements should be obviously inconsistent, troubling and point to the inadequacy of the PCAST Committee addressing the topic of forensic science reliability. I fail to see why the medical and psychology fields can have another expert review another’s work (on what may be life and death decisions) and opine on the analyses/interpretations; yet a qualified forensic science analyst cannot perform a technical review of forensic work to assess analyses/interpretations (especially since the report has ignored data that support that at some level forensic testing is reliable). The logic of the PCAST Committee escapes me.

The PCAST Report discusses DNA typing and the limitations that have been encountered with mixture interpretation. For example on page 75 the report states

“DNA analysis of complex mixtures—defined as mixtures with more than two contributors—is inherently difficult and even more for small amounts of DNA.”

I concur that it is more challenging to interpret DNA mixtures compared with single-source DNA profiles. But the report fails to add that difficult does not necessarily translate into impossible or that proper interpretations can be made. The difficulties with mixture interpretation were not due to a lack of good, valid approaches to employ as there were valid approaches and also not due to the fact that there is some subjective judgment with interpretations. The issue, and it is a serious one, was that many of the practitioners in the forensic DNA community were inadequately trained, did not seek out solutions, or instead chose to wait for guidance (see pages 77-78 of the PCAST report and discussion on Texas and mixture interpretation). These issues were similar to the mixture interpretation problems at the Department of Forensic Sciences in Washington, DC (in which I was the scientist who identified the problems).

The PCAST Report assails the use of the Combined Probability of Inclusion (CPI) which is one of the methods used by the community and endorsed by the DNA Advisory Board (11) 17 years ago. However, the discussion of the Texas Forensic Science Commission (TFSC) (of which I was deeply involved in the review of mixture interpretation for the State) and how it pursued and addressed inappropriate interpretation of mixtures actually implies that valid methods do exist; otherwise how could a group of international experts (of which I was one of the experts) assess the situation, determine that there are problems in the application of interpretation guidelines, and provide guidance to the community to implement sound procedures?

The PCAST Committee on page 78 of the report states

“The TFSC also convened an international panel of scientific experts—from the Harvard Medical School, the University of North Texas Health Science Center, New Zealand’s

forensic research unit, and NIST—to clarify the proper use of CPI. These scientists presented observations at a public meeting, where many attorneys learned for the first time the extent to which DNA-mixture analysis involved subjective interpretation. Many of the problems with the CPI statistic arose because existing guidelines did not clearly, adequately, or correctly specify the proper use or limitations of the approach.”

The report properly focuses on lack of detailed guidelines on interpretation and does not suggest that the principles of how to calculate the CPI are erroneous. Indeed, nowhere in the report are there any data to indicate that the CPI is foundationally erroneous.

Yet, the report then states on page 78

“In summary, the interpretation of complex DNA mixtures with the CPI statistic has been an inadequately specified—and thus inappropriately subjective—method. As such, the method is clearly not foundationally valid.”

The allegation that the CPI is not foundationally valid demonstrates the lack of understanding (and again the lack of documentation of review) by the PCAST Committee. In fact, these statements also demonstrate another report inconsistency – this time about the principles of statistical calculations related to DNA profiles. On page 72 the report states

“The process for calculating the random match probability (that is, the probability of a match occurring by chance) is based on well-established principles of population genetics and statistics.”

The random match probability is one approach to calculating a statistic for single-source samples and appears to be endorsed by the PCAST Committee as well-established and thus valid. Yet, the PCAST Committee takes the opposite position for the CPI stating it is not foundationally valid. If one reads my colleagues and my most recent paper on the CPI (12), cited in the PCAST Report, it is clear that the principles of the foundational validity of the CPI are the same as those for the random match probability. Consider a similar situation which is the chance of drawing four aces in a row from a standard deck of cards is estimated to be 1 in 270,275. This value is based on probability theory and does not require an empirical testing to be published in the peer reviewed literature to support its validity. The CPI and random match probability use the same population frequency data and the same well-established principles of population genetics and statistics. While this is another example of myopia by the PCAST Committee, it borders on the bizarre that the PCAST Committee failed to understand the foundations of DNA statistics.

All know the PCAST Committee had access to the most recent paper on the use of the CPI (and the references within that paper) as it is stated on page 78 of the report

“Because the paper appeared just as this report was being finalized, PCAST has not had adequate time to assess whether the rules are also *sufficient* to define an objective and scientifically valid method for the application of CPI.”

I note that the CPI is a rather simple concept and its foundations are basic. It is surprising that the PCAST Committee, which touts its vast expertise, could not readily assess the paper. Given the importance of their report and this topic it also is surprising that they would not have done so before finalizing their report.

The PCAST Report recognizes that probabilistic genotyping is an advancement to improve or reduce subjectivity in DNA mixtures (see page 79). I concur. But the report states on page 79

“Appropriate evaluation of the proposed methods should consist of studies by multiple groups, *not associated with the software developers*, that investigate the performance and define the limitations of programs by testing them on a wide range of mixtures with different properties.”

Also the report states on page 81

“Because empirical evidence is essential for establishing the foundational validity of a method, PCAST urges forensic scientists to submit and leading scientific journals to publish high-quality validation studies that properly establish the range of reliability of methods for the analysis of complex DNA mixtures.”

Publication is part of the peer-review process and I support publication by the developers and others who adopt the method. But the PCAST Committee has placed a requirement that is unrealistic to meet which is publication by the user laboratories. It is likely that a few at most laboratories will be able to publish their validation testing of the software. Anyone who serves on editorial boards of scientific journals should know that journals are unlikely to publish additional studies because they are not considered novel. Yet, the PCAST Committee failed to recognize this fact.

It is important to stress that the report contains no criticisms of probabilistic genotyping and still there are no data contained in the report that demonstrate that the PCAST Committee actually reviewed (or better yet tested) the current probabilistic genotyping software programs (even though it claims to have done extensive review, such as the undocumented 2000 papers).

Forensic laboratories are required to perform validation studies, and there are substantial data on mixtures that support the validity of mixture interpretation and use of probabilistic genotyping. Mixture studies are required to be performed by every laboratory engaged in analyzing such evidence as part of their validation studies. Many of these studies lack novelty and thus will never be published in peer-review journals. However, the PCAST Committee could have contacted a number of forensic DNA laboratories who have implemented one of the probabilistic genotyping software programs (as there were laboratories operating or near implementation of the tools at the time of the report’s publication) to gain access to the validation data to determine whether there are sufficient data to support the already peer-reviewed published work. There is no indication that the PCAST Committee made any effort to become informed to opine on the reliability and validity of probabilistic genotyping.

The PCAST Committee simply ignored a wealth of validation data residing in crime laboratories. If the PCAST Committee had taken a holistic approach, they would have considered the totality of data in determining whether there is support for the validity and reliability of probabilistic genotyping. Peer-review publications by the developers and validation data by the users combined clearly support the software and its applications. Indeed, this failure of the PCAST Committee of not considering all available data is reminiscent of a similar situation that occurred 25 years ago with another report – the National Research Council I Report (NRC I) (13). The NRC I Report proposed a non-scientific, *ad hoc* way to calculate statistics called the ceiling principle. The ceiling principle had no genetics foundation or validity and was roundly rejected. One of the bases for the proposed ceiling principle approach (espoused by the NRC I Committee) was a lack of population data. There were substantial population data in crime

laboratories world-wide at the time the NRC I Report was published; but the NRC I Committee did not seek out the data. As soon as the NRC I Report was published, I reached out to my colleagues around the world and gathered the existing data which were then compiled into a five volume compendium (14). If the NRC I Committee had chosen to consider extant population data, they might have prepared a more informed Report. The outcome was that the National Academy of Sciences convened a second committee and produced the sound NRC II Report (10), which was steeped in fundamental population genetics and statistical applications. The findings of the NRC II Report in part were based on the data I compiled in the five volume compendium which were available prior to the publication of the rejected NRC I Report. The PCAST Report has taken the same blinded approach and ignored extant data with a similar outcome as 25 years ago – a report that provides little value for assessing the state-of-the-art and even less value for providing guidance to improve the forensic sciences.

In conclusion, the few examples above demonstrate that the PCAST Report 1) is **not** scientifically sound, 2) is **not** based on data, 3) is **not** well-documented, 4) misapplies statistics, 5) is full of inconsistencies, and 6) does **not** provide helpful guidance to obtain valid results in forensic analyses.

References

1. Budowle, B. and SWGMGF Members: Quality assurance guidelines for laboratories performing microbial forensic work. *Forens. Science Communications* October 5(4): 2003, At: www.fbi.gov/hq/lab/fsc/current/2003_10_guide01.htm.
2. Budowle, B., Schutzer, S.E., Einseln, A., Kelley, L.C., Walsh, A.C., Smith, J.A.L., Marrone, B.L., Robertson, J., and Campos, J.: Building microbial forensics as a response to Bioterrorism. *Science* 301: 1852-1853, 2003.
3. Budowle, B., Schutzer, S.E., Morse, S.A., Martinez, K.F., Chakraborty, R., Marrone, B.L., Murch, R.S., Jackson, P.J., Williamson, P., Harmon, R., and Velsko, S.P.: Guidance for validation in microbial forensics. *Applied and Environmental Microbiology* 74:5599-5607, 2008.
4. Budowle, B., Connell, N.D., Bielecka-Oder, A., Colwell, R.R., Corbett, C.R., Fletcher, J., Forsman, M., Kadavy, D.R., Markotic, A., Morse, S.A., Murch, R.S., Sajantila, A., Schmedes, S.E., Ternus, K.L., Turner, S.D., Minot, S.: Validation of high throughput sequencing and microbial forensics applications. *BMC Invest. Genet.* 5:9, 2014.
5. The FBI Director's Forensic Quality Assurance Standards for DNA Testing Laboratories, http://media.wix.com/ugd/4344b0_4a22824ce56f43d4b1a4d2486409f95d.pdf
6. SWGDAM Validation Guidelines for Forensic DNA Analysis Methods, https://docs.wixstatic.com/ugd/4344b0_813b241e8944497e99b9c45b163b76bd.pdf
7. SWGDAM Guidelines for the Validation of Probabilistic Genotyping Systems, https://docs.wixstatic.com/ugd/4344b0_22776006b67c4a32a5ffc04fe3b56515.pdf

8. Smrz, M.A., Burmeister, S.G., Einseln, A., Fisher, C.L., Fram, R., Stacey, R.B., Theisen, C.E., and Budowle, B.: Review of FBI latent print unit processes and recommendations to improve practices and quality. *J. Forens. Ident.* 56(3):402-434, 2006.
9. Harmon R. and Budowle, B.: Questions about forensic science. *Science* 311:607, 2006.
10. NRC II Report, *The Evaluation of Forensic DNA Evidence*, 1996, <https://www.nap.edu/catalog/5141/the-evaluation-of-forensic-dna-evidence>
11. Statistical and Population Genetics Issues Affecting the Evaluation of the Frequency of Occurrence of DNA Profiles Calculated From Pertinent Population Database(s), DNA Advisory Board, *Forensic Science Communications* 2(3), 2000, <https://archives.fbi.gov/archives/about-us/lab/forensic-science-communications/fsc/july2000/dnastat.htm>
12. Bieber, F.R., Buckleton, J., Budowle, B., Butler, J., and Coble, M.D.: Evaluation of forensic DNA mixture evidence: protocol for evaluation, interpretation, and statistical calculations using the combined probability of inclusion. *BMC Genetics* 17(1):125, 2016.
13. NRC I Report, *The Evaluation of Forensic DNA Evidence*, 1992, <https://www.nap.edu/read/5141/chapter/1#ii>
14. Federal Bureau of Investigation: *VNTR Population Data: A Worldwide Study, Volumes I-IV*, Forensic Science Research and Training Center, FBI Academy, Quantico, Virginia, 1993.

I declare under penalty of perjury that the forgoing is true and correct to the best of my knowledge.



Bruce Budowle, Ph.D.
Director
Center for Human Identification
University of North Texas Health Science Center
Fort Worth, Texas 76107
Email: Bruce.Budowle@unthsc.edu
Tel: 817-735-2979

Draft

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: (b) (6) Ted Hunt
Date: Fri, 25 Aug 2017 19:11:58 -0400
Attachment: DRAFT doc (12 33 kB)

Ted R. Hunt
Senior Advisor on Forensic Science
Office of the Deputy Attorney General
United States Department of Justice
950 Pennsylvania Ave, NW
Washington, D.C. 20530

(b) (6)
(U) (O)

RE: Upcoming Travel

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: "Brinkley, Winnie (ODAG)" <(b) (6)>
Date: Wed, 27 Sep 2017 17:07:16 -0400
Attachment 171026 Hunt TravAuth Bo ton MA doc (13 43 kB); 171023 Hunt TravAuth Philadelphia doc (13 32 kB)

Winnie,

My revisions to the travel requests are attached above.

Thank ,

Ted

From: Brinkley, Winnie (ODAG)
Sent: Wednesday, September 27, 2017, 1:07 PM
To: Hunt, Ted (ODAG) <(b) (6)>
Subject: Upcoming Travel

Ted,

I have drafted the travel authorization memos for your trip to Philadelphia and Boston. Please review and make any necessary edits.

Also, here are the train options for October 23:

Washington to Philadelphia

184 Northeast Regional departs at 9 20am and arrives 11 12am
174 Northeast Regional departs at 10:10am and arrives 12:01pm.

Philadelphia to Washington

93 Northeast Regional departs at 3:27pm and arrives 5:15pm.
19 Crescent departs at 3:55pm and arrives 5:55pm
85 Northeast Regional departs at 4:30pm and arrives 6:25pm.
173 Northeast Regional departs at 4:55pm and arrives 6:51pm.

Winnie Brinkley
Staff Assistant
U.S. Department of Justice
Office of the Deputy Attorney General
950 Pennsylvania Avenue NW
Washington, D.C. 20530
Tel: (b) (6) (direct)
Fax: (b) (6)

October 2, 2017

MEMORANDUM

TO: James Crowell
Chief of Staff and
Associate Deputy Attorney General
Office of the Deputy Attorney General

FROM: Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Department of Justice
Office of the Deputy Attorney General

SUBJECT: Travel Authorization for Boston, Massachusetts – October 26-27, 2017

I am attending a symposium sponsored by the Advisory Committee on the Federal Rules of Evidence to be held in Boston on October 27. The purpose of the symposium is to discuss whether FRE 702 should be amended, a separate rule drafted for forensic science, a note to the rule be added, or a best practice manual drafted for the judiciary. I am on a panel and will provide the Department's view on the PCAST Report. A preparation meeting with other Department speakers at the symposium will occur at the U.S. Attorney's Office in Boston the day before the symposium, on October 26.

This trip will be paid for by the Deputy Attorney General's Office. The estimated expenses are \$1,500.00 which will include: airfare, lodging, meal per diem, and miscellaneous. There is a conference registration fee of \$500.00 to be paid by the Deputy Attorney General's Office. My plan is to depart October 26, and return October 27, 2017.

Please let me know if you have any questions.

APPROVE: _____

DISAPPROVE: _____

OTHER: _____

Attachment(s)

October 2, 2017

MEMORANDUM

TO: James Crowell
Chief of Staff and
Associate Deputy Attorney General
Office of the Deputy Attorney General

FROM: Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Department of Justice
Office of the Deputy Attorney General

SUBJECT: Travel Authorization for Philadelphia, Pennsylvania – October 23, 2017

I have been invited to a meeting with law enforcement representatives from IACP, ASCIA, and MCCA on forensic science to be held in Philadelphia on October 23. This meeting is designed to gather information for the forensic science needs assessment (and subsequent Report) announced by the DAG during his speech to the IAI in Atlanta this past August. This meeting is being facilitated by the Office of Legal Policy (OLP) and NIJ.

This trip will be paid for by the Deputy Attorney General's Office. The estimated expenses are \$500.00 which will include: train fare, meal per diem, and miscellaneous. My plan is to depart and return on October 23, 2017.

Please let me know if you have any questions.

APPROVE: _____

DISAPPROVE: _____

OTHER: _____

Attachment(s)

Amy Ely's response to PCAST

From: Kristine Hamann <(b) (6) pceinc.org>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Fri, 15 Sep 2017 15:45:09 -0400
Attachment 20160923 Memo re PCAST Report NAAG Amy Ely pdf (234 86 kB)

Hi Ted,

Here is Amy's response to the PCAST report. She has not widely disseminated it, but she has made it available to prosecutors.

I look forward to seeing you in DC.

Best,
Kris

ANALYSIS OF SEPTEMBER 19, 2016 PCAST REPORT: “FORENSIC SCIENCE IN CRIMINAL COURTS: ENSURING SCIENTIFIC VALIDITY OF FEATURE-COMPARISON METHODS”

September 23, 2016

***By Amie Ely, National Association of Attorneys General,
Director of NAGTRI Center for Ethics & Public Integrity***

I. PCAST Members and Senior Advisors

The President's Council of Advisors on Science and Technology (PCAST) refers to itself as “the leading external scientific advisory body established by the Executive Branch.” “Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods” (herein “Report”), released September 19, 2016, at 144.

All of the 19 Members of PCAST are scientists. Only one has practiced forensic science.¹ Members’ areas of expertise range from mathematics and genome research, to physics and computer engineering, to aerospace and environmental change. Despite this lack of training and experience, at least five Members have previously spoken about or written on the need for radical overhaul of the current judicial approach to forensic evidence admissibility.

Eric S. Lander, Co-Chair of the Council, is a mathematician and researcher in genome biology. Lander is the only PCAST Member to have served as an expert witness in forensics, as he has testified on behalf criminal defendants in the past.

In a case that began his long relationship with the Innocence Project, Lander testified, as one of several defense experts, regarding the admissibility of DNA evidence in the prosecution of Joseph Castro, who was charged with murdering a pregnant woman named Vilma Ponce and her 2-year old daughter. *See, e.g., People v. Castro*, 544 N.Y.S.2d 985, 985, 989 (Bronx S. Ct. 1989). A small bloodstain, which prosecution experts were prepared to testify came from Ms. Ponce, was found on Castro’s watch. After a lengthy hearing, Bronx Supreme Court Judge Gerald Scheindlin suppressed the DNA evidence and announced a new legal test for admissibility of DNA evidence. This decision was inconsistent with several other decisions admitting similar DNA evidence—one of which was later affirmed by the New York Court of Appeals in a decision that rebuked the *Castro* case. *People v. Wesley*, 83 N.Y.2d 417, 436 n.2 (NY 1994) (“We disagree with the conclusion of the court in *People v. Castro*”).²

¹ One other Member, S. James Gates, Jr., is a staff member of the National Commission on Forensic Science, which was established by the DOJ in 2013. Gates is a theoretical physicist who studies string theory. His 101-page C.V. reveals no familiarity with—or even interest in—any areas of forensic science. *See* Curriculum Vitae: Sylvester James Gates, Jr., *available at* http://www.umdphysics.umd.edu/images/CV/gates_cv.pdf.

² In an interesting footnote to the *Castro* case: Joseph Castro pled guilty about a month after the DNA evidence was suppressed, and admitted that the blood on his watch did, indeed, belong to the woman he stabbed to death. *See* “DNA Forensic Testing Industry Faces Challenges to Credibility,” *The Scientist*, Nov. 1989, *available at* <http://www.the-scientist.com/?articles.view/articleNo/10722/title/DNA-Forensic-Testing-Industry-Faces-Challenge-To-Credibility/>.

The analysis in *Castro* was also criticized by the Second Circuit Court of Appeals, which noted that Judge Scheindlin arbitrarily “added another layer to make [the] already conservative test [set forth in *Frye*,³ the case followed by New York state courts] even more stringent.” See *United States v. Jakobetz*, 955 F.2d 786, 794 (2d Cir. 1992).⁴ Concluding that even with “novel, complex, and confusing evidence” like the then-nascent field of DNA, “the jury must retain its fact-finding function,” the Circuit warned against erecting “a difficult hurdle” to admissibility that “excludes highly relevant evidence simply because it is complicated.” *Id.* at 796. It then applied Federal Rule of Evidence 702 to conclude that the challenged DNA evidence had been properly admitted by the federal district court and affirmed the conviction. *Id.* at 797.

Since *Castro*, Lander has been an activist for the need to reevaluate forensic evidence in criminal trials. As a recent example: in an April 2015 *New York Times* editorial, “Fix the Flaws in Forensic Science,” he wrote, “Troubling, about a quarter of the cases examined by the Innocence Project (on whose board I now serve) involved forensic scientists who had erroneously claimed to identify defendants with near-certainty by matching hair samples, fibers, shoe prints or bite marks.” Available at <http://www.nytimes.com/2015/04/21/opinion/fix-the-flaws-in-forensic-science.html>. In the same editorial, which was published five months before PCAST was given the mandate to examine forensic science, Lander wrote “No expert should be permitted to testify without showing three things: a public database of patterns from many representative samples; precise and objective criteria for declaring matches; and peer-reviewed published studies that validate the methods.”

Perhaps unsurprisingly, as summarized below, the recommendations made by PCAST largely mirror those outlined by Lander in his *NYT* editorial.

In addition to its scientific members, PCAST was advised by lawyers and judges PCAST referred to as “Senior Advisors.” The Senior Advisors include several federal judges and lawyers who have expressed dissatisfaction with forensic science. For example, one of the co-chairs, Judge Harry Edwards (D.C. Cir.), was a co-chair of a committee that prepared a 2009 report titled “Strengthening Forensic Science in the United States: A Path Forward,” available at <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf>, that was critical of forensic science and is relied upon in the PCAST Report. Edwards’s report concluded that “much forensic evidence—including, for example, bitemarks and firearm and toolmark identifications—is introduced in criminal trials without any meaningful scientific validation, determination of error rates, or reliability testing to explain the limits of the discipline.” Edwards Report at 107-08.

³ *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).

⁴ The Second Circuit noted that the Eighth Circuit, in a decision that was vacated, briefly adopted the *Castro* analysis. *Jakobetz*, 955 F.2d at 794-95 (citing *United States v. Two Bulls*, 925 F.2d 1127 (8th Cir. 1991). In a later case, the Eighth Circuit held that even if *Two Bulls* had “any precedential value, it ended with *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 125 L. Ed. 2d 469, 113 S. Ct. 2786 (1993).” *Pioneer Hi-Bred Int’l v. Holden Found. Seeds, Inc.*, 35 F.3d 1226, 1229 (8th Cir. 1994). Accordingly, *Castro* should be treated as an anomaly that has been universally rejected—a legal reality not acknowledged in the PCAST Report.

Another PCAST Senior Advisor is Ninth Circuit Judge Alex Kozinski. In an editorial supporting the PCAST Report, which was published on the *Wall Street Journal* website several hours before the Report was made public, Kozinski opined that the Report “will immediately influence ongoing criminal cases, as it provides a road map for defense lawyers to challenge prosecution experts.” See Alex Kozinski, “Rejecting Voodoo Science in the Courtroom,” *Wall Street Journal*, available at <http://www.wsj.com/articles/rejecting-voodoo-science-in-the-courtroom-1474328199>.

II. The Report

PCAST released its Report, titled “Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods,” near midnight on September 19, 2016. This report followed an August 26, 2016 draft that was widely leaked to the press but, as far as we know, not provided through any official channels to stakeholders directly impacted by its conclusions.

As described in greater length below, after creating requirements to assess whether various forensic disciplines are “scientifically valid,” the Report then considers whether the following forensic feature comparison methods meet the test it created: (1) DNA analysis of single-source and simple-mixture samples, (2) DNA analysis of complex-mixture samples, (3) bitemarks, (4) latent fingerprints, (5) firearms toolmark identification, and (6) footwear analysis.⁵ The Report concludes that only DNA analysis of single-source and simple-mixture samples and latent fingerprint science are “foundationally valid”; that some means of analyzing complex-mixture samples are, to be colloquial, better than others; and that bitemarks, firearms toolmark identification, and footwear analysis all lack scientific validity.

A. The Report’s Requirements for “Scientific Validity”

The Report argues that the following requirements should be met before certain areas of forensic science are determined to be “scientifically valid” and thus worthy of admission in federal criminal cases. See Report at 65-66. Because these requirements employ terms of art that PCAST uses in its later analysis and recommendations, the model is summarized and those terms of art are defined here.

1. Foundational Validity

a. Procedure

First, the method itself is capable of identifying features in evidence samples (e.g., identifying the characteristics of a latent fingerprint left at a scene); *second* the method can be used to compare features in two samples (e.g., comparing the latent with a known fingerprint from a suspect); and *third*, the method contains guidance about at what level of similarity the features in the two samples should be declared to be some the same source.

⁵ The Report also refers to a recent DOJ hair analysis evaluation. *Id.* at 67.

b. “Empirical Estimates”

“*Appropriately designed studies*⁶ from multiple groups” that establish (1) the method’s false positive rate (e.g., how often the suspect fingerprint is incorrectly declared to match the latent); and (2) the method’s sensitivity (e.g., the probability that it declares a proposed identification between samples that actually come from the same source). *Id.* at 65.

N.B.: For “objective” methods (defined here to be only DNA analysis), demonstrating reliability of the individual steps is sufficient to fulfill the foundational validity requirement. For “subjective” methods (here, bitemarks, latent fingerprints, firearms identification, and footwear analysis) “black-box” studies⁷ are the only way to establish foundational validity; “[i]n the absence of such studies, a subject feature-comparison method cannot be considered scientifically valid.”

2. Validity as Applied

If, and only if, the forensic feature-comparison method has been established as “foundationally valid,” its validity much be established as applied in every case in which it is used. In essence, this means that the examiner must have passed appropriate proficiency testing and must have applied the appropriate procedures in the specific case in which s/he is testifying. The examiners must also, e.g., report the overall false positive rate and sensitivity.

B. The Report’s Findings Regarding Forensic Disciplines

After establishing its requirements for forensic methods to be considered foundationally valid and valid as applied, the Report then considers whether the following forensic feature comparison methods are “scientifically valid and reliable”: (1) DNA analysis of single-source and simple-mixture samples, (2) DNA analysis of complex-mixture samples, (3) bitemarks, (4) latent fingerprints, (5) firearms identification, and (6) footwear analysis.⁸ *Id.* at 67-122.

PCAST notes that it “expects that some forensic feature-comparison methods may be rejected by courts as inadmissible because they lack adequate evidence of scientific validity.” *Id.* at 122. Here are the Report’s findings:

1. DNA Analysis of Single-Source and Simple-Mixture Samples

Single-source DNA—a DNA sample from only on person—and simple-mixture DNA—DNA from two people, such as DNA from rapist and a victim obtained from a rape kit—are

⁶ The Report contains “a number of criteria” that should be satisfied by a study, including that it is “conducted or overseen by individuals or organizations with no stake in the outcome” and that “there should be multiple independent studies by separate groups reaching similar conclusions.” *Id.* at 66. Presumably, this would mean that studies done by the very forensic scientists who practice in the areas criticized by the Report would be deemed inappropriately designed, and that until more than one “independent” study has been completed and published, the forensic areas are insufficiently scientifically rigorous to be admitted in court.

⁷ “Black-box studies” are defined as “empirical stud[ies] that assesses a subjective method by having examiners analyze samples and render opinions about the origin or similarity of samples.” *Id.* at 48.

⁸ The Report also refers to a recent DOJ hair analysis evaluation. *Id.* at 67.

foundationally valid. For a particular DNA analysis to be valid “as applied”, the Report states, a testifying expert must have “undergone rigorous and relevant proficiency testing,” should disclose in report whether s/he was told any facts about the case that “might influence the conclusion”; “should disclose, upon request, all information about quality testing and quality issues in his or her laboratory.” *Id.* at 69; *see also id.* at 147.

2. DNA Analysis of Complex-Mixture Samples

The Report is relatively agnostic about whether the analysis of DNA from “complex mixtures”—that is, from more than two contributors—is foundationally valid. It concludes that one “subjective” method, Combined-Probability-of-Inclusion, “**is not foundationally valid,**” but allows that courts might nonetheless consider admitting evidence obtained from that method if the analysts followed “rules specified” in a recent paper. *Id.* at 82. A second “objective” method, Probabilistic Genotyping, is described as “**a relatively new and promising approach**” for which foundational validity has not yet been established. *Id.* at 82; *see also id.* at 148. It nonetheless concludes that additional studies by “multiple groups, *not associated with the software developers*” are necessary to establish whether Probabilistic Genotyping is foundationally valid. *Id.* at 79.

3. Bitemarks

The Report concludes that bitemark analysis does “**not meet the standards for foundational validity,**” and cites several studies that supported that conclusion. *Id.* at 82; *see also id.* at 148. The Report adds that it is unlikely that bitemark analysis could ever be scientifically valid and “advise[s] against” devoting resources into additional professionalization and study. *Id.* at 87.

4. Latent Fingerprints

The Report “applauds the FBI’s efforts” in completing several black-box studies to assess the foundational validity of latent fingerprint analysis and “white-box” studies designed to assess validity as applied. After reviewing eight latent fingerprint studies, the Report concludes that only two were “properly designed” and recommends that jurors be informed there were “only two properly designed studies of the accuracy of latent fingerprint analysis,” and that those studies revealed false positives as high as one-in-18—what it refers to as “substantial.”⁹ *Id.* at 96, 101. The Report also recommends, without any empirical support, that jurors also be told that, because examiners in the studies “were aware they were being tested, the actual false

⁹ The study from which the one-in-18 error rate is cited is unpublished, and this conclusion is at odds with that reached by the study itself, as the authors concluded that 35 of the 42 false positives—out of 995 examinations—were likely because the participants made clerical errors. *Id.* at 94-95. If the study’s author’s conclusions were respected, the error rate would be one error in 73 cases, rather than one out of 18. Moreover, the study included some verification by a second examiner—a process used by the FBI. *Id.* at 90. In that verification portion, every single error was caught by the second examiner. *Id.* at 96 n.285. Thus, in cases in which a second examiner verifies the conclusions of the first, the data suggests that the false positive rate is vanishingly small. The Report nonetheless suggests that jurors be informed that fingerprint examiners may incorrectly report a match in over 5% of the cases they examine.

positive rate in casework may be higher.” *Id.* at 101, 149. Nevertheless, the Report concludes that latent fingerprints are **foundationally valid**. *Id.* at 149.

The Report also concludes that examiners must “complete and document their analysis of a latent fingerprint before looking at any known fingerprint” and “separately document any additional data relied upon” to compare the latent and known fingerprints added after the comparison began.¹⁰ *Id.* at 100. As the Report required for DNA examiners, it states that each fingerprint examiner must undergo “regular and rigorous proficiency testing,” for his or her analysis in a case to be valid as applied. Moreover, the Report states that it must be established in every case that the latent prints are “of the quality and completeness represented in foundational validity studies,” and instructs that “courts should assess the measures taken to mitigate bias during casework” by “ensuring that examiners are not exposed to potentially biasing information...” *Id.* at 101, 149.

5. Firearms Identification

The Report concludes that firearms analysis—that is, determining whether a bullet was fired from a particular firearm—“**currently falls short of the criteria for foundational validity**” because only one “appropriately designed study” exists. (That study found a false positive rate of one-in-66, but because PCAST found the other seven studies it reviewed to be incorrectly designed, it didn’t consider firearms identification to have been subjected to sufficiently rigorous testing to permit juries to consider evidence or testimony from firearms analysts. *Id.* at 112). The Report adds:

Whether firearms analysis should be deemed admissible based on current evidence is a decision that belongs to the courts. If firearms analysis is allowed in court, the scientific criteria for validity as applied should be understood to require clearly reporting the error rates seen in appropriately designed black-box studies (estimated at 1 in 66, with a 95 percent confidence limit of 1 in 46, in the one such study to date).

Id. at 112, 150. If firearms analysis is allowed in court, PCAST’s validity analysis requires, once again, a proficient expert who discloses any facts of which s/he was aware that might influence her/his conclusion. *Id.*

6. Footwear Analysis

The Report does not address whether examiners can reliably determine “class characteristics” of shoes—e.g., if a shoeprint was made by a size 12 Nike Air Jordan released in 2014. Instead, it considers whether a court should introduce expert testimony that a particular piece of footwear—e.g., the size 12 Nike in the defendant’s closet—made a particular shoeprint. Because none of the three studies PCAST located were, in its estimation, correctly designed, it concluded that any conclusions reached by footwear analysts were “**unsupported by any meaningful evidence or estimates of their accuracy and thus are not scientifically valid.**”

¹⁰ Only if that process is used, the Report suggests, is latent fingerprint analysis foundationally valid. *Id.* at 101.

Id. at 150. The Report did not include any specific directions to courts—unlike for firearms analysis.

7. Hair Analysis

PCAST relied entirely on the materials the DOJ cited for the DOJ’s Proposed Uniform Language for Testimony and Reports for the Forensic Hair Examination Discipline (the “DOJ Proposal”).¹¹ While the Report does not explicitly state that hair analysis lacks foundational validity, it disagrees with the DOJ Proposal, which concludes that “microscopic hair comparison has been demonstrated to be a valid and reliable scientific methodology...” *Id.* at 118. In rather pointed language, PCAST states that the studies the DOJ cited in support of that conclusion “do not provide a scientific basis for concluding... a valid and reliable process” *id.* at 120, as they were “strongly criticized by other studies for flawed methodology,” *id.* at 118.

The PCAST Report then suggests that the DOJ faces “constraints” in undertaking scientific evaluations of forensic science “because critical evaluations by the DOJ might be taken as admissions that could be used to challenge past convictions or present prosecutions,” underscoring the need for “a science-based agency” not involved with the criminal justice system to carry out “evaluations of scientific validity and reliability.” *Id.* at 122.

C. The Report’s Recommendations to the Federal Government

After concluding that several forensic science disciplines lack foundational validity, the Report makes recommendations to federal science-based agencies, the FBI Laboratory, the U.S. Attorney General and her prosecutors, and the federal bench. In summary, those recommendations are that the science-based agencies and the FBI secure millions of dollars to do more research and then do that research; and that the Attorney General and federal judges do not seek to admit, or admit into evidence, evidence from the forensic disciplines that PCAST has determined lack “foundational validity.”

1. Science-Based Agencies

The Report recommends that NIST (the National Institute of Standards and Technology) take the lead in designing and implementing studies, and in assessing the foundational validity and reliability of laboratory techniques and practices. *Id.* at 124, 128. It also recommends that NIST prepare an annual report “evaluating the foundational validity of key forensic feature-comparison methods, based on available, published empirical studies.” *Id.* at 124, 128-129. The Report suggest that NIST should help “propel” a “transformation” in complex DNA analysis, latent fingerprint analysis, and firearms analysis from subjective (human read) to objective (machine read) analyses. *Id.* at 125.

¹¹ DOJ’s Forensic Science Discipline Review is studying the areas of forensic science in the PCAST Report, but uses a much more transparent procedure to solicit feedback and criticism from the stakeholders who will be impacted by any FSDR recommendations. The impact of the PCAST Report on the FSDR process is difficult to predict.

NIST has been working with the forensic science community to establish the Organization of Scientific Area Committees for Forensic Science (OSAC).¹² *Id.* at 126, 129-130. PCAST criticizes OSAC as being “dominated by forensic professionals” and “concludes that OSAC lacks sufficient independent scientific expertise and oversight to overcome the serious flaws in forensic science.” *Id.* at 126. It recommends that OSAC be restructured and specifies a new committee that should be formed within OSAC that would be composed entirely of non-forensic scientists and statisticians. *Id.* It also recommends that any standards under review by OSAC be made available without cost to, e.g., indigent defendants. *Id.*

The Report notes that funding for research in forensic science is “extremely small,” and recommends “[s]ubstantially larger funding...” *Id.* at 127. PCAST says the “President should request and Congress should provide” \$14 million more to NIST than is currently appropriated. *Id.* at 129.

2. The FBI Laboratory

PCAST recommends that the FBI increase the research community’s access to its forensic database. *Id.* at 132-33. It also recommends that the FBI’s Research and Development budget be “increased to a total of \$20 million”¹³ in order to facilitate an expanded research program. *Id.* at 135.

3. The Attorney General

The Report recommends that the DOJ “ensure that testimony about forensic evidence presented in court scientifically valid.” *Id.* at 136, 140. The Report suggests that DOJ: undertake a review of forensic feature-comparison methods (beyond those reviewed in this report) to identify which methods used by DOJ lack appropriate black-box studies necessary to assess foundational validity. Because such subjective methods are presumptively not established to be foundationally valid, DOJ should evaluate (1) whether DOJ should present in court conclusions based on such methods and (2) whether black-box studies should be launched to evaluate those methods.

Id. at 136.

The Report states that if there are “not adequate empirical studies and/or statistical models to provide meaningful information about the accuracy of a forensic feature-comparison method, DOJ attorneys and examiners should not offer testimony based on the method. If it is necessary to provide testimony concerning the method, they should clearly acknowledge to courts the lack of such evidence.” *Id.* at 141. **The corollary to this, based on the above, is that**

¹² NIST describes OSAC here: <https://www.nist.gov/forensics/organization-scientific-area-committees-forensic-science>.

¹³ Or perhaps \$30 million; the Report is inconsistent. *Compare id.* at 132 (\$20 million) *with id.* at 135 (“The President should request and Congress should provide increased appropriations to the FBI to restore the FBI Laboratory’s budget for forensic science research activities from its current level to \$30 million and should evaluate the need for increased funding for other forensic-science research activities in the Department of Justice.”).

PCAST is recommending that the DOJ not seek to introduce evidence from the following disciplines: DNA analysis of complex-mixture samples—particularly those done with Combined Probability of Inclusion methods—bitemarks, firearms identification, footwear analysis, and hair analysis.¹⁴

In underscoring why its recommendations should be followed, Report states, without citation to any source, that improper forensic testimony has “led to many wrongful convictions.” *Id.* at 140.

The Report then criticizes, again, the DOJ’s hair science review process and suggests that the DOJ’s proposed uniform language for testimony and report for forensic footwear and tire impressions “have serious problems.” *Id.* at 137-138. It then recommends that the Attorney General “revise and reissue for public comment” these proposals “to bring them into alignment with standards for scientific validity.” *Id.* at 140-141.

4. The Federal Judiciary

PCAST summarizes its recommendation to federal judges regarding “scientific criteria” for admissibility as follows:

Scientific validity and reliability require that a method has been subjected to empirical testing, under conditions appropriate to its intended use, that provides valid estimates of how often the method reaches an incorrect conclusion. For subjective feature-comparison methods, appropriately designed black-box studies are required, in which many examiners render decisions about many independent tests (typically, involving “questioned” samples and one or more “known” samples) and the error rates are determined. Without appropriate estimates of accuracy, an examiner’s statement that two samples are similar—or even indistinguishable—is scientifically meaningless: it has no probative value, and considerable potential for prejudicial impact. Nothing—not personal experience nor professional practices—can substitute for adequate empirical demonstration of accuracy.

Id. at 143.

While the Report purports to make only scientific, not legal recommendations, it is hard to view the “scientific criteria” as doing anything but requiring a legal conclusion regarding admissibility consistent with PCAST’s recommendations regarding “foundational validity.” Indeed, PCAST itself links “foundational validity” to Federal Rule of Evidence 702(c) and “validity as applied” to Rule 702(d). *Id.* at 145.

¹⁴ While the Report does not explicitly conclude that hair analysis lacks foundational validity, it strongly suggests that conclusion—and, in inviting the DOJ to do its own analysis, it is difficult to see where such an analysis under the PCAST “standards” would find hair analysis foundationally valid.

PCAST notes that, in seeking “advice from our panel of Senior Advisors” regarding whether to afford legal precedent any weight, it was “advised that the Supreme Court has made clear that a court may overrule precedent if it finds that an earlier case was ‘erroneously decided and that subsequent events have undermined its continuing validity.’” *Id.* at 144 n. 387, 144. In the Report, PCAST claims to “express[] no view on the legal question of whether any past cases were ‘erroneously decided.’” PCAST then states that, “from a scientific standpoint, subsequent events have indeed undermined the continuing validity of conclusions that were not based on appropriate empirical evidence,” thus **inviting federal judges to overrule settled precedent regarding the admissibility of DNA analysis of complex-mixture samples, bitemarks, firearms identification, footwear analysis, and hair analysis.** *Id.* at 144.

III. Responses to the Report

A. The U.S. Department of Justice

U.S. Attorney General Loretta Lynch has stated that the DOJ “will not be adopting the recommendations related to the admissibility of forensic science evidence.” The statement, which is released to media outlets when they seek a comment about the PCAST Report, reads in full:

Over the past several years, the Department of Justice has taken unprecedented steps to strengthen forensic science, including new investments in forensic science research, draft guidance to lab experts when they testify in court, and reviews of forensic testimony in closed cases. We remain confident that, when used properly, forensic science evidence helps juries identify the guilty and clear the innocent, and the Department believes that the current legal standards regarding the admissibility of forensic evidence are based on sound science and sound legal reasoning. We understand that PCAST also considered the issue of certain legal standards, alongside its scientific review. While we appreciate their contributions to the field of scientific inquiry, the Department will not be adopting the recommendations related to the admissibility of forensic science evidence.

B. The Federal Bureau of Investigation

The FBI has released a one-page response to the Report, available at <https://www.fbi.gov/file-repository/fbi-pcast-response.pdf/view>. In that response, it agrees with PCAST that “forensic science plays a critical role in the criminal justice system” and thus “needs to be held to high standards,” and that additional funding is needed to “develop stronger ties between the academic research community and the forensic science community.”

The FBI then criticizes both the Report’s “broad, unsupported assertions regarding science and forensic science practice,” and PCAST’s decision to “create[] its own criteria for scientific validity.” The response also notes, correctly, that PCAST doesn’t even apply this invented and subjective criteria “consistently or transparently” and that PCAST ignores “numerous published research studies which seem to meet PCAST’s criteria...”

C. The Media

The media response to the Report has taken the assertions and recommendations at face value. Articles and Op-Eds published this week include:

- “White House Advisory Council Report Is Critical of Forensics Used in Criminal Trials,” *Wall Street Journal*.¹⁵ The Report “sets the stage for criminal-defense challenges of long-held evidentiary methods and promises increased courtroom battles with prosecutors over the use of expert witnesses.”
- Judge (and PCAST Senior Advisor) Harry T. Edwards, “A wake-up call on the junk science infesting our courtrooms,” *Washington Post*.¹⁶ The Report “persuasively explains” that “bite mark analysis, firearms identification, footwear analysis and microscopic hair comparisons ... have not yet been proved to be reliable forms of legal proof.” Edwards adds “What is noteworthy about the new report is that it is written solely by eminent scientists who carefully assess forensic methods according to appropriate scientific standards.”
 - *Note*: this is likely to be the piece that resonates most with judges.
- “Obama’s science advisors: Much forensic work has no scientific foundation,” *Ars Technica*.¹⁷ “The report finds that all of the techniques have problems when it comes to operating on a firm scientific footing, so PCAST makes strong recommendations for how to get forensic science to take its name seriously.” (Also accepts Lander’s claim that the *Castro* case led to “reforms and analysis that eventually put the field on firm scientific footing”)

IV. Next Steps for Prosecutors

The Report is likely to lead to defense challenges regarding the admissibility of forensic evidence in “live” criminal cases and attacks on convictions—both as direct appeals and as collateral challenges.¹⁸ It is also likely to confuse the public, particularly given the one-sided treatment in the media of the recommendations it makes. That said, it could serve as a bit of a “call to arms” for prosecutors to jointly address the legal challenges to the admissibility of valid and reliable forensics evidence and to better inform themselves about the benefits and limits of forensic science.

¹⁵ <http://www.wsj.com/articles/white-house-advisory-council-releases-report-critical-of-forensics-used-in-criminal-trials-1474394743>

¹⁶ https://www.washingtonpost.com/opinions/a-wake-up-call-on-the-junk-science-infesting-our-courtrooms/2016/09/19/85b6eb22-7e90-11e6-8d13-d7c704ef9fd9_story.html?utm_term=.996c9e5cbee6

¹⁷ <http://arstechnica.com/science/2016/09/obamas-science-advisors-much-forensic-work-has-no-scientific-foundation/>

¹⁸ For example, the Report may be used to argue that a defense attorney who stipulated to the admissibility of—or did not vigorously attack—ballistics toolmark evidence was constitutionally ineffective.

A. Addressing Legal Challenges: A Preliminary Assessment

The Report’s legal analysis—while couched as a recommendation based on science—runs counter to settled caselaw regarding the admissibility of expert evidence. The analysis that follows is quite preliminary and does not purport to be an exhaustive review of the relevant legal standards or an assessment of how those standards have been applied throughout the states.

The Report suggests judges consider forensic evidence through a lens like that the Second Circuit rejected in *Jakobetz*: one that adds the additional element added by the judge in *Castro*—and one rejected by other courts throughout the land. The Report invites judges to usurp the role of jurors as factfinders—and, frankly, the role of defense counsel as informed partisans—by erecting “difficult hurdle[s]” that would “exclude[] highly relevant evidence simply because it is complicated.” *United States v. Jakobetz*, 955 F.2d 786, 796 (2d Cir. 1992). Moreover, while the Report cites *Daubert v. Merrell Dow Pharms.*, 509 U.S. 579 (1993), it does not properly describe the clear directions the Supreme Court provided to judges assessing the admissibility of expert testimony.

1. Daubert Standard

Federal courts and some state courts follow *Daubert* and Federal Rule of Evidence 702, which direct judges to apply “a more liberal standard of admissibility for expert opinions than did *Frye v. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923),” *Williams*, 506 F.3d at 161-62 (quoting *Daubert*, 509 U.S. at 588). As a recent Second Circuit Court of Appeals summarized the *Daubert* test:

An expert witness is “permitted wide latitude to offer opinions, including those that are not based on firsthand knowledge or observation,” but only after a trial judge has determined “whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue”...

Querub v. Moore Stephens Hong Kong, 15-2100 (Civ), 2016 U.S. App. LEXIS 9213 (2d Cir. N.Y. May 20, 2016) (unpublished) (quoting *Daubert*, 509 U.S. at 591-92).

As an example, the Second Circuit considered whether ballistics testimony—like that found by PCAST to lack “foundational validity”—was properly admitted by a trial court. *United States v. Williams*, 506 F.3d 151, 160-62 (2d Cir. 2007). The court below had denied the defendant’s request for a full-blown *Daubert* hearing regarding the testimony, and had instead ruled on the papers submitted by the parties, which included:

- citations by the Government to other recent decisions admitting similar evidence
- information from the Government about the expert’s training and experience, including her years spent examining firearms (12); her “hands-on training” from her supervisor; her attendance at seminars on firearms examiner; publication of her writings in a peer-reviewed journal; the number of firearms she’d examined (2,800); and her prior expert testimony on 20-30 occasions

Id. at 161. The Circuit easily concluded that the trial judge had fulfilled her gatekeeping function, given the information provided by the Government, and that there was no need for the “formality of a separate hearing.” *Id.*

2. *Frye* Standard

Other state courts apply the stricter *Frye* standard, including New York and Maryland. But as noted by the New York Court of Appeals in *Wesley*—and the Second Circuit in *Jakobetz*—even that standard does not erect the high hurdle proposed by the PCAST Report. *Wesley*, 83 N.Y.2d at 436; *Jakobetz*, 955 F.2d 794.

Under *Frye*, 293 F. 1013, scientific opinion testimony is admissible if the scientific principles involved are generally accepted in the relevant scientific community. The Criminal Practice Manual describes *Frye* as holding that: “expert testimony concerning scientific evidence must rest on a scientific principle that is demonstrably reliable and not still in the experimental stages[.]” 2 Crim. P. Man. §733:3 (LexisNexis 2016).

Frye states:

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.

293 F. at 1014. Thus, a ruling on admissibility under *Frye* distinguishes between the case-specific application of scientific principles and the underlying scientific principles themselves. It is not the expert’s opinion in a particular case, but rather “the thing from which the deduction is made [which] must be sufficiently established to have gained general acceptance in the particular field in which it belongs.” *Frye*, 293 F. at 1014.

For example, in Maryland, “an expert opinion must be based on a scientific method or principle that has gained general acceptance in the *relevant* scientific community.” *Ross v. Hous. Auth. of Balt. City*, 430 Md. 648, 660 n.10, (Md. 2013) (emphasis added). Even under this standard, as the Maryland Court of Appeals has held, “the validity and reliability of a scientific technique may be so broadly and generally accepted in the scientific community that a trial court may take judicial notice of its reliability. Such is commonly the case today with regard to ballistics tests, fingerprint identification, blood tests, and the like.” *Reed v. State*, 283 Md. 374, 391 A.2d 364 (1978) (adopting standard set forth in *Frye*).

Given that the PCAST Report is authored by scientists who are in no way members of the “relevant scientific community” in the disciplines they disavow, an argument can be made that none of their “findings” undercut the validity of, e.g., ballistics evidence. In many ways, the PCAST Members are akin to experts in mergers and acquisitions suggesting reforms to the

probable cause standard: they may be quite smart and well-versed in their field, but the fact that they happened to also be members of the same profession gives them no standing to dictate a sea change in areas in which they have no expertise.

B. Educating Prosecutors and Forensic Scientists

The PCAST Report has underscored the importance of prosecutors understanding the potential and limits of forensic science. The studies cited about bitemark analysis suggest that it is largely discredited—or “bad science.” As no good prosecutor ever wants an innocent person to be incarcerated based on faulty science—or any other inaccurate evidence—the PCAST Report can provide a useful stimulus for prosecutors to become informed about the proper use of forensic science in criminal investigations and trials.

As a result, the Report should stimulate conversations among federal, state, and local prosecutors about the legal issues in admitting forensics testimony—that is, how to thoughtfully address the inevitable “PCAST Motions” that will be made in an effort to remove valid and reliable evidence from jurors’ purview and to disturb settled verdicts. This highlights the need for trainings to ensure that prosecutors understand the scientific and logical support for, and factual bases of, forensic testimony they would seek to admit and defend.

Amie Ely wants to share PCAST

From: (b) (6) sharepointonline.com
To: (b)(6) Ted Hunt (ODAG)
Cc: (b) (6) naag.org
Date Fri, 20 Jul 2018 10 39 02 0400

Link to share drive

From: Amie Ely <(b) (6)naag.org>
To: "Hunt, Ted (ODAG)" <(b) (6)>
Date: Fri, 20 Jul 2018 10:40:03 -0400

(b) (6)

Materials are in the PCAST Responses folder.

RE: Amy Ely's response to PCAST

From: "Hunt, Ted (ODAG)" <(b) (6)>
To: Kristine Hamann <(b) (6)>
Date: Fri, 15 Sep 2017 15:52:49 -0400

Thank Kri ,

Ye , (b)(5) and I think I've seen this before not the one I wrote

Look forward to seeing you soon

Ted

From: Kristine Hamann [(b) (6)] [pceinc.org]
Sent: Friday, September 15, 2017, 3:52 PM
To: Hunt, Ted (ODAG) <(b) (6)>
Subject: Amy Ely' re po

Hi Ted,

Here is Amy's response to the PCAST report. She has not widely disseminated it, but she has made it available to prosecutors.

I look forward to seeing you in DC.

Best,
Kris