AAAS Quote

From: "Hunt, Ted (ODAG)" <(b) (6)
To: "Antell, Kira M. (OLP)" <(b) (6)
Date: Mon, 18 Sep 2017 11:26:51 -0400

Here's a quote from the AAAS report that is a bit helpful in that it (b)(5)

Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
Office of the Deputy Attorney General
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950 Pennsylvania Ave, NW
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AAFS DAG Speech

From: "Hunt, Ted (ODAG)" <(b) (6)
To: "Antell, Kira M. (OLP)" <(b) (6)
Date: Mon, 22 Jan 2018 09:52:16 -0500
Attachment Hunt Comment AAFS DAG Speech 01122018 doc (33 03 kB)

Kira,

Solid speech. I've added some comments re a few thoughts I had. Once you fill it out with the rest of your text, I will get started with Swanson to round it out.

Thanks,

Ted

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Accepted: PCAST & FRE Meeting with NAAG

From: "Hunt, Ted (ODAG)" <(b) (6)
To: "Antell, Kira M. (OLP)" <(b) (6)
Date: Thu, 05 Oct 2017 09:43:41 -0400
Attachment Unnamed Attachment (1 33 kB)

Accepted: PCAST & FRE Meeting with NAAG

Where:	RFK Building, 950 Pennsylvania Avenue NW, OLP Conference Room (b) (6)
When:	Thu Oct 05 16:00:00 2017 -04:00
Until:	Thu Oct 05 16:45:00 2017 -04:00
Required Attendee	PARTSTAT ACCEPTED Common Name Hunt, Ted (ODAG) MAILTO (b) (6)

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

My Comments-Law Review Articles

From: "Hunt, Ted (ODAG)" <(b) (6)
To: "Antell, Kira M. (OLP)" <(b) (6)
Date: Thu, 04 Jan 2018 18:38:36 -0500
Attachment Hunt Edit Fordham Law Review article LabDiv 122017 FINAL to DOJ doc (39 48 kB); Hunt Comments-ADG Article 01032018 (ADG edits)_KMA_v2.docx (61.62 kB)

Comments are attached Some of them are a bit direct in order to be succinct and clear, and aren't meant to be critical —I'm just easily confused. Added just a few light revisions as well. Let's talk them over before forwarding to others.

Thx.

Ted

Ted R. Hunt
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Fordham Law Review-Lab Div.

From: "Hunt, Ted (ODAG)" <(b) (6)
To: "Antell, Kira M. (OLP)" <(b) (6)
Date: Tue, 16 Jan 2018 19:33:55 -0500
Attachment Hunt Comment Fordham Law Review article Lab Div 01162018 doc (38 18 kB)

My comments/revisions are attached.

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David Kaye on Ballistics

From: Kristine Hamann (b) (6) pceinc.org>
To: Ted Hunt <(b) (6) >, "Antell, Kira M. (OLP)" <(b) (6)
Date: Thu, 15 Mar 2018 13:25:42 -0400
Attachment 20180203 Firearm Mark Evidence Looking Back and Looking Ahead Ca e We tern Law Review Kaye.pdf (223.11 kB)

Hi Ted and Kira,

In light of our earlier di cu ion on te timony by foren ic e pert , here i a recent article by David Kaye With the growth of ATF sponsored Crime Gun Intelligence Centers, the use of ballistic evidence at trial is on the ri e But, a Kaye note , the PCAST report doe n't eem to be having a big impact in court

Hope all i well

Be t,
Kris

Kristine Hamann
Executive Director
Prosecu llence (PCE)
email: (b) (6)
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RE: David Kaye on Ballistics

From: "Hunt, Ted (ODAG)" <(b) (6)
To: Kristine Hamann (b) (6) pceinc.org>
Date: Fri, 16 Mar 2018 14:47:24 -0400

Hi Kri ,

Thank very much will take a look thi weekend

Ted

From: Kristine Hamann [mailto:(b) (6) pceinc.org]
Sent Thur day, March 15 2018
To: Hunt, Ted (ODAG) <(b) (6) >; Antell, Kira M. (OLP) <(b) (6)
Subject David Kaye on B

Duplicative Material see bates stamp 20220314-12311

Firearm-mark Evidence:
Looking Back and Looking Ahead

Case Western Reserve Law Review
Vol. 68, 2018 (forthcoming)

David H. Kaye
Distinguished Professor of Law and Weiss Family Scholar
Penn State Law (University Park)

Paul Giannelli has written—with clarity and conviction—on just about every type of scientific evidence commonly used in criminal cases. To celebrate his extraordinary contributions, this essay surveys the development of the law on one type of feature-matching evidence that repeatedly attracted Paul's attention. This summary reinforces and extends Paul's work on what I will call firearm-mark evidence.[1] By inspecting toolmarks on bullets or spent cartridge cases. firearms examiners can supply valuable information on whether a particular gun fired the ammunition in question. But the limits on this information have not always been respected in court, and a growing number of opinions have tried to address this fact. Reviewing this development is significant not merely because the evidence is commonly employed in criminal cases, but also because of a recent, highly publicized[2] argument against its admission from some of the national's leading scientists and technologists[3] and because it can inform a pending effort to improve the federal rules as they apply to forensic-science identification evidence.[4]

[1] "Although this subject is popularly known as 'ballistics,' that term is not correct." PAUL C. GIANNELLI ET AL., 1 SCIENTIFIC EVIDENCE § 14.01, at 755 (5th ed. 2012).

[2] *E.g.*, Alex Kozinski, *Rejecting Voodoo Science in the Courtroom*, Wall St. J., Sept. 19, 2016.

[3] Executive Office of the President, PCAST, Report to the President on Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods, Sept. 2016 [hereinafter cited as 2016 PCAST Report].

[4] 86 FORDHAM L. REV. (forthcoming Mar. 2018).

As we shall see, the courts have moved from a position of skepticism of the ability of examiners to link bullets and other ammunition components to a particular gun to full-blown acceptance of claims of identification "to the exclusion of all other firearms."[5] With one notable exception, the challenges to firearm-mark evidence over the past decade or so, have generated nothing more than occasional restrictions on the degree of confidence that firearms experts can express in court. They have not altered the paradigm of supplying source conclusions instead of statements about the degree to which the evidence supports these conclusions.[6] After reviewing the stages in the judicial reception of firearm-mark evidence, this article concludes by describing a more scientific, quantitative, evidence-based form of testimony that should supplant or augment the current experience-based decisions of skilled witnesses.

I. Rejection of Expert Source Attributions

For a time, courts did not admit testimony that items originated from a particular firearm. Some courts reasoned that jurors could make the comparisons and draw their own conclusions. In *People v. Weber*,[7] for example, the trial court struck from the record an examiner's testimony "that in his opinion the two bullets taken from the bodies were fired from this pistol, leaving that

[5] *E.g.*, In re Barrett, 840 F.3d 1223, 1238 (10th Cir. 2016) ("Ballistics expert Terrance Higgs tied the bullet fragment that killed Eales to Defendant's .223 Colt H Bar Sporter rifle, 'to the exclusion of all guns that are made or that will be made.'"); United States v. Law, 252 F.3d 1357, 2001 WL 422948 at *1 (5th Cir. 2001) ("ballistics expert testified that the cartridge recovered at the earlier robbery and the cartridge used in the Griffin carjacking were used in the same weapon 'to the exclusion of all other firearms in the world.'").

[6] In this context, a source conclusion is a statement about the truth or probability of the hypothesis that a specific, known gun fired the bullet in question. Statements of support stop short of drawing a conclusion about the hypothesis. Instead, they describe the probability of the evidence (the extent to which the features of the items being compared are observed to correspond) under competing source hypotheses. *See* DAVID H. KAYE ET AL., THE NEW WIGMORE ON EVIDENCE: EXPERT EVIDENCE ch. 14 (2d ed. 2011); David H. Kaye, *Statistical Hypothesis Testing in Law and Forensic Science: A Memorandum*, 130 HARV. L. REV. F. 127 (2017); *infra* Part VI.

[7] 86 P. 671 (Cal. 1906).

as a question for the jury to determine by an inspection of the bullets themselves."[8] In this 1904 trial, the court did not question the expert's ability to discover toolmarks that could be probative of identity, but it saw no reason to believe that the expert would be better than lay jurors at drawing inferences from that information.[9] Other courts allowed such opinions, but not if they were stated as "facts."[10]

II. Acceptance of Expert Source Attributions

With the recognition that the line between "opinions" and "facts" had little substance and with the demise of the rigid rule prohibiting "ultimate facts"—which were said to "invade the province of the jury"[11]—courts came to admit conclusive source attributions. Firearms examiners reasoned that "[i]t may be quite common for two or more prominent individual marks on bullets from two entirely different guns to match exactly, but the chance that there will be a correspondence of a great many of the individual characteristic marks on two bullets that came from different guns is so remote as to amount to a practical impossibility."[12] By the 1950s, it was understood that "the modern tendency of the courts [is] to allow the introduction of expert testimony to show that the bullet or cartridge found at the scene of a crime was fired from a

[8] *Id*. at 697.

[9] The court explained that "the comparison of the . . . bullets . . . is not a matter of expert testimony, but one within the ordinary capacities of the average juror or citizen." *Id*.

[10] E. LeFevre, *Expert Evidence to Identify Gun from Which Bullet or Cartridge Was Fired*, 26 A.L.R. 2d 892 (1952) (§ 3). For example, in *State v. Martinez*, 198 P.2d 256 (N.M. 1948), the state supreme court held that testimony that "positively that the evidence bullet (death bullet) was fired out of [defendant's] gun" was an instance of inadmissible "conclusions stated as facts and not as opinions." *Id*. at 260-61.

[11] *E.g.*, Grismore v. Consolidated Prods. Co., 5 N.W.2d 646, 647 (1942) (overruling State v. Steffen, 230 N.W. 536, 538 (Iowa 1930)).

[12] JULIAN S. HATCHER, TEXTBOOK OF FIREARMS INVESTIGATION, IDENTIFICATION AND EVIDENCE 288 (1st ed. 1935); *cf*. ALBERT S. OSBORN, QUESTIONED DOCUMENTS 227-30 (1910) (duplication of class and individual characteristics of handwriting can be "practically impossible" because the joint probability is a "negligible quantity").

particular gun, where it is definitely shown that the witness by whom the testimony is offered is, by experience and training, qualified to give an expert opinion on firearms and ammunition."[13] Firearms (and other types of) examiners were known to testify that their judgments are not subject to any margin of error[14] and are scientific certainties.[15] Of course, expert testimony was not required to be so extreme; testimony that a bullet merely could or might have come from a particular firearm also was admissible.[16]

III. Heightened Scrutiny Following *Daubert*

Beginning in the 1990s, scientists and lawyers began to question the theories of individualization and discernible uniqueness of firearms toolmarks. They asked how examiners (operating without standards explicitly defining what degree of similarity in a set of features warrants a source attribution) could *know*—in the sense described in *Daubert v. Merrell Dow Pharmaceuticals*[17]—that a given gun fired the recovered items. A series of challenges to the admissibility of source attributions by firearms examiners ensued, and professional examiners

[13] LeFevre, *supra* note 9, § 5.

[14] *Watkins v. Commonwealth*, 331 S.E.2d 422, 434 (Va. 1985). The Virginia Supreme Court saw no problem with "this positive statement" which "merely affects the weight of his testimony" and "does not necessarily invalidate or even weaken the results of his ballistics testing." *Id*.

[15] United States v. Natson, 469 F.Supp.2d 1253, 1261 (N.D.Ga. 2007) (FBI supervisory special agent Paul Tangren identified "opined that he held this opinion to a 100% degree of certainty.").

[16] PAUL GIANNELLI ET AL., *supra* note 1, § 14.06[a], at 773; Jay M. Zitter, Admissibility of Testimony that Bullet Could or Might Have Come from Particular Gun, 31 ALR4th 486 (1984) (§ 1).

[17] 509 U.S. 579 (1993). *Daubert* interpreted the phrase "scientific knowledge" in Federal Rule of Evidence 702 to mean "derived by the scientific method . . . supported by appropriate validation—i.e., 'good grounds,' based on what is known." *Id*. at 590. An untold number of cases have attempted to apply these generalities. *See, e.g.*, Giannelli et al., *supra* note 1; KAYE ET AL., *supra* note 6, § 7.3.

responded with an "Admissibility Resource Kit" to "assist firearm examiners in better preparing for evidence admissibility hearings that began to greatly proliferate in 2002."[18]

Initially, the courts were unfazed by the post-*Daubert* skepticism about what they comfortably knew as "a recognized method of ballistics testing"[19] that "has been accepted in criminal cases for many years."[20] But then a number of federal district courts expressed misgivings about holistic judgments of "sufficient agreement of individual characteristics."[21] No court excluded all evidence of similarities, but several struggled to find ways to allow examiners to assist the jury without testifying that cartridge components definitely came from the known firearm or that nothing else was scientifically or practically possible. The first such case during this period was *United States v. Green.*[22] In a summary of cases in this period, Paul called the

[18] SWGGUN Admissibility Resource Kit (ARK), https://afte.org/resources/swggun-ark; *cf.* Kirsten Jackson, *The* Daubert *Era, in* SCIENTIFIC EXAMINATION OF QUESTIONED DOCUMENTS 37, 41 (Jan Seaman Kelly & Brian S. Lindblom eds. 2d ed. 2006) (attributing success in rebuffing "over 30 *Daubert* challenges" to handwriting identification to "the *Daubert* Group" formed by the American Board of Forensic Document Examiners).

[19] United States v. Hicks, 389 F.3d 514, 526 (5th Cir. 2004) ("the matching of spent shell casings to the weapon that fired them has been a recognized method of ballistics testing in this circuit for decades").

[20] United States v. Foster, 300 F. Supp. 2d 375, 377 n.1 (D. Md. 2004) (reasoning that "the 'human ability to recognize a similar pattern and distinguish between dissimilar patterns' makes identification possible" and that "[b]allistics evidence has been accepted in criminal cases for many years"). Some courts frankly declined to require compliance with all the *Daubert* factors. *E.g.*, United States v. Santiago, 199 F. Supp. 2d 101, 112 (S.D.N.Y. 2002) (acceptance "in the community of forensics experts" can substitute for acceptance in "a scientific community"). For more strategies used to avoid the strictures of *Daubert* for criminalistics identification evidence, see David H. Kaye, *How* Daubert *and Its Progeny Have Failed Criminalistics Evidence and a Few Things the Judiciary Could Do About It*, 86 FORDHAM L. REV. __ (2018).

[21] SWGGUN Admissibility Resource Kit (ARK): Summary of the Examination Method, https://afte.org/resources/swggun-ark/summary-of-the-examination-method; *cf.* AFTE Theory of Identification as It Relates to Toolmarks, https://afte.org/about-us/what-is-afte/afte-theory-of-identification ("sufficient agreement" for "subjective" "individualization/identification" occurs "when the agreement in individual characteristics exceeds the best agreement demonstrated between toolmarks known to have been produced by different tools and is consistent with agreement demonstrated by toolmarks known to have been produced by the same tool").

[22] 405 F. Supp. 2d 104 (D. Mass. 2005).

opinion, written by U.S. District Judge Nancy Gertner, "riveting."[23] It restricted the firearms examiner to testifying about the matching features—a reversion to the *Weber* era.[24] The expert admitted that in applying the Association of Firearms and Toolmark Examiners' (AFTM's) theory of sufficiency,[25] "it's just your opinion? You determine which marks you're going to pay attention to and which ones you're not?"[26] The court found the examiner's assurance "that this match could be made 'to the exclusion of every other firearm in the world'" to be "extraordinary, particularly given [the] data and methods."[27] In view of the method's subjectivity, potential for bias, and lack of data on error rates, the district court perceived "no accurate way of evaluating the testimony."[28]

No other modern, published opinion has confined the examiner to reporting on similarities and differences in the toolmarks.[29] Instead, a few concerned courts focused on how firmly an examiner could characterize source attributions. In *United States v. Monteiro*,[30] another federal district judge in the same district adopted the more lenient rule that "the expert may testify that the cartridge cases were fired from a particular firearm to a reasonable degree of

[23] Paul C. Giannelli, *Ballistics Evidence Under Fire*, Crim. Just., Winter 2011, at 50.

[24] *See supra* Part I.

[25] *See supra* note 20.

[26] *Green*, 405 F. Supp. 2d at 112 n.15.

[27] *Id*. at 107.

[28] *Id*. at 121 (footnote omitted).

[29] For discussion of unadorned "'features only' testimony" and single-stage "'not excluded' or 'match'" testimony for scientific identification evidence, see KAYE ET AL., *supra* note 6, §§ 15.3 & 15.4.

[30] 407 F.Supp.2d 351 (D. Mass. 2006),

ballistic certainty. However, the expert may not testify that there is a match to an exact statistical certainty."[31]

Seeking a less opaque formulation, District Judge Jed Rakoff in *United States v. Glynn*[32] excluded testimony of "a reasonable degree of ballistic certainty"[33] in favor of a weaker statement of "more likely than not."[34] This conclusion-lite testimony, along with other evidence in the case, led to a conviction and life sentence.[35]

The *Glynn* court denied that firearms source attributions "could . . . be called 'science,'"[36] because when asked "what constitutes 'sufficient agreement' between two pieces of ballistic evidence to declare a match, [the government's expert] admitted that the assessment is subjective, in that 'it is an opinion of mine and whether or not someone else would agree with it is up to that individual.'"[37] The *Glynn* court may have been influenced by a report of a committee of the National Academy of Sciences.[38] This NAS committee was formed to assess the feasibility of creating a computer-searchable national database "that would house images of firings of all newly manufactured and imported firearms . . . as an aid to criminal

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[31] *Id*. at 355.

[32] 578 F. Supp. 2d 567 (S.D.N.Y. 2008).

[33] *Id*. at 574.

[34] *Id*. at 575. GIANNELLI ET AL., *supra* note 1, § 14.06[b], at 776, suggests that *Monteiro* used the same standard. However, the only use of the phrase is in a citation to a case involving bite-mark evidence as one illustration of the type of testimony that would fall short of the "100 percent sure" asservations that the court excluded in favor of "reasonable ballistic certainty." *Monteiro*, 407 F. Supp. 2d at 372.

.[35] U.S. Attorney for the Southern District of New York, Press Release, Bloods Gang Member Sentenced to Life in Prison for Ordering a Drug-related Murder in 2000, Jan. 28, 2009, available at https://www.justice.gov/archive/usao/nys/pressreleases/January09/glynnsentencingpr.pdf.

[36] *Id*. at 570 (footnote omitted).

[37] *Id*. at 571 (footnote omitted). Thus, the court found that the AFTE "standard defining when an examiner should declare a match—namely, 'sufficient agreement'—is inherently vague." *Id*. at 572.

[38] *Id*. (citing the report).

investigations."[39] Although the committee was concerned with digital imaging and pattern-recognition technology, it began with an inquiry into the logic of traditional firearm-mark analysis.[40] It reported that "[t]he validity of the fundamental assumptions of uniqueness and reproducibility of firearms-related toolmarks has not yet been fully demonstrated"[41] Moreover, the committee approved of opinions that "refused to accept 'exclusion of all other firearms' arguments"[42] and disapproved of the practice of "overreach[ing] to make extreme probability statements."[43]

[39] NAT'L RESEARCH COUNCIL COMM. TO ASSESS THE FEASIBILITY, ACCURACY, AND TECHNICAL CAPABILITY OF A NATIONAL BALLISTICS DATABASE, BALLISTIC IMAGING 1 (Daniel L. Cork et al., eds. 2008) [hereinafter cited as 2008 Report]. The committee concluded that such a database would not be advisable, but recommended enhancements to the existing National Integrated Ballistic Information Network (NIBIN). *Id*. at 5-6.

[40] Id. at 3 ("Underlying the specific tasks with which the committee was charged is the question of whether firearms-related toolmarks are unique: that is, whether a particular set of toolmarks can be shown to come from one weapon to the exclusion of all others. Very early in its work, the committee found that this question cannot now be definitively answered.").

[41] *Id*. at 5, 81.

[42] *Id*. at 84.

[43] *Id*. The AFTE disagreed. It maintained, as it always has, that examiners can and do achieve practical scientific certainty. AFTE Committee for the Advancement of the Science of Firearm & Toolmark Identification, The Response of the Association of Firearm and Tool Mark Examiners to the National Academy of Sciences 2008 Report Assessing the Feasibility, Accuracy, and Technical Capability of a National Ballistics Database, 40 AFTE J. 234, 242 (2008), available at https://afte.org/uploads/documents/position-nas-2008.pdf. The AFTE's definition of "practical certainty" for "a scientific conclusion" is surprisingly weak. It means only that "an examiner . . . believes the conclusion to be true and accurate; . . . has rational grounds for [the belief]; and "acknowledges that, in the abstract, it is not possible to achieve absolute certainty for results flowing from a scientific theory or technique."); *cf*. John E. Murdock et al., *The Development and Application of Random Match Probabilities to Firearm and Toolmark Identification,* 62 J. FORENSIC SCI. 619, 625 (2017) ("Absolute certainty opinions may have been adopted in the past, but this type of position has been retired for some time and no longer represents the consensus thinking of the firearm and toolmark community. . . . [O]ur everyday lives are predicated upon practical certainty. There is a practical certainty that our car will start in the morning (assuming it is in good mechanical condition), or that our (normally obedient) dog will come when called.").

IV. Heightened Scrutiny Following the 2009 NAS Report

Soon after the 2008 NAS report, a larger NAS Committee on Identifying the Needs of the Forensic Sciences Community observed that "[m]uch forensic evidence—including, for example, bite marks and firearm and toolmark identifications—is introduced in criminal trials without any meaningful scientific validation . . . ."[44] The committee reiterated some of the statements from the 2008 report,[45] emphasized the need for valid estimates of the uncertainties in forensic-science identification methods generally,[46] and pointed to a way to express the probative value of the associations without drawing a source conclusion.[47]

Neither the 2008 nor the 2009 NAS report made recommendations on admissibility of evidence, for that was not part of their charge.[48] Practitioners and prosecutors proposed that this meant that the reports should or could not be taken as undermining the admissibility of traditional firearm-mark or other highly judgmental pattern-matching identifications.[49] However,

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[44] NAT'L RESEARCH COUNCIL COMM. ON STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD 107-08 (2009) (footnotes omitted).

[45] *Id*. at 154.

[46] *Id*. at 184.

[47] The committee remarked that "[p]ublications such as Evett et al., Aitken and Taroni, and Evett provide the essential building blocks for the proper assessment and communication of forensic findings." *Id*. at 186 (notes omitted; these references advocate strength-of-evidence statements rather than source conclusions).

[48] Indeed, the 2008 committee cautioned that "*the proposal for this study explicitly precluded the committee from assessing the admissibility of forensic firearms evidence in court, either generally or in specific regard to testimony on ballistic imaging comparisons*." 2008 Report, *supra* note 38, at 20 (emphasis in original). In the next breath, the committee added that "We note, however, that high-subjectivity branches of forensic science are now confronting growing skepticism with regard to discernible uniqueness as a result of a number of legal and scientific studies." *Id*.

[49] *E.g.*, AFTE Comm., *supra* note 42; Government's Opposition to Defendant's Motion to Exclude Expert Testimony Concerning Latent Fingerprint Evidence at 3, United States of America v. Titus Faison, No. 2008-CF2-16636 (D.C. Super. Ct. Feb. 19, 2010), as quoted in Harry T. Edwards, *The National Academy*

the committees' reviews of the literature clearly lent credence to the questions about the routine admission of categorical source attributions based on firearm-marks.[50] In five prominent published opinions, courts cited the NAS reports and the opinions in Part III to limit such testimony. First, the district court in *United States v. Taylor*[51] deemed the AFTE theory of sufficiency "circular."[52] It reiterated the assessment of the 2009 NAS committee that "a

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of Sciences Report on Forensic Sciences: What It Means for the Bench and Bar, 51 JURIMETRICS J. 1 (2010) (describing this argument as "utterly absurd").

[50] For example, in describing the scientific basis of "forensic science fields like firearms examination," the 2008 report quoted with approval an article by two forensic scientists stating that "[f]orensic individualization sciences that lack actual data, which is most of them, . . . simply . . . assume the conclusion of a miniscule probability of a coincidental match . . . ." 2008 REPORT, *supra* note, at 54. Apparently recognizing the threat of such assessments, AFTE complained that the committees' literature reviews were shallow. In response to the 2008 report, it wrote that "the committee lacked the expertise and information necessary for the in-depth study that would be required to offer substantive statements with regard to these fundamental issues of firearm and toolmark identification." AFTE Comm., *supra* note 42, at 243. Likewise, it wrote that "the [2009] NAS committee in effect chose to ignore extensive research supporting the scientific underpinnings of the identification of firearm and toolmark evidence." AFTE, *The Response of the Association of Firearms and Tool Mark Examiners to the February 2009 National Academy of Science Report "Strengthening Forensic Science in the United States: A Path Forward,"* 41 AFTE J. 204, 206 (2009). According to AFTE, "years of empirical research . . . conclusively show that sufficient individuality is often present on tool (firearm tools or non-firearm tools) working surfaces to permit a trained examiner to conclude that a toolmark was made by a certain tool and that there is no credible possibility that it was made by any other tool working surface." AFTE Comm., *supra* note 42, at 242. After all, "[t]he principles and techniques utilized in forensic firearms identification have been *used internationally* for nearly a century *by the relevant forensic science community* to both identify and exclude specific firearms as the source of fired bullets and cartridge cases." *Id*. at 234 (emphasis added). Prosecutors too sought to blunt the implications of the skeptical statements about the limited validation of the premises of the traditional theory of bullet-mark identification with an affidavit from the chairman of the NAS committee that wrote the 2008 report. Affidavit of John E. Rolph, United States v. Edwards, No. F-516-01, Super. Ct., D.C., May 23, 2008. Yet, the affidavit merely collects excerpts from the report itself and ends with one that could be read as supporting admissibility under certain conditions. For another affidavit from a committee member contending that NAS "has questioned the validity of these fundamental assumptions of uniqueness and reproducibility," see Declaration of Alicia Carriquiry In Support of Motion in Limine to Exclude Firearms Examiner's Opinion, People v. Knight, No. LA067366, Super. Ct., Los Angeles County, at 2. Apr. 2012. The use of affidavits of one or two committee members to give their personal views on what the words that the committee as a whole agreed upon is ill-advised. It resembles asking individual members of Congress to provide their *post hoc* thoughts on what a committee report on legislation (or the statute itself) really meant.

[51] 663 F. Supp. 2d 1170 (D.N.M. 2009).

[52] *Id.* at 1177.

fundamental problem with toolmark and firearms analysis is the lack of a precisely defined process. . . . AFTE has adopted a theory of identification, but it does not provide a specific protocol."[53] To cope with the absence of controlling standards for making source attributions, the court held that the expert "will not be permitted to testify that his methodology allows him to reach this conclusion as a matter of scientific certainty [or] that there is a match to the exclusion, either practical or absolute, of all other guns."[54] Instead, "[h]e may only testify that, in his opinion, the bullet came from the suspect rifle to within a reasonable degree of certainty in the firearms examination field."[55]

Second, *United States v. Willock*[56] provides the most extensive judicial analysis of firearms testimony to date. It observes that "toolmark analysis guidance provided by the AFTE lacks specificity because it allows an examiner to identify a match based on 'sufficient agreement,' which the AFTE defines using the undefined terms 'exceeds the best agreement' and 'consistent with.'"[57] Based on "reading . . . the many published studies, journal articles, and cases," Magistrate Judge Paul Grimm characterized "the AFTE theory . . . that once 'sufficient agreement' [establishes] a practical impossibility" as "astonishing."[58] The district court ordered "[t]hat [the expert] not be allowed to opine that it is a 'practical impossibility' for any other

[53] *Id*. at 1178.

[54] *Id*. at 1180.

[55] *Id*.

[56] 696 F. Supp. 2d 536 (D. Md. 2010).

[57] *Id*. at 566 (describing the reasoning of the 2009 NAS report).

[58] *Id*. at 572.

firearm to have fired the cartridges [and that he] only be permitted to state his opinions and bases without any characterization as to degree of certainty."[59]

Third, in *Commonwealth v. Pytou Heang*,[60] the Massachusetts Supreme Judicial Court enumerated difficulties with the AFTE theory of sufficiency and practical impossibility. It settled on "reasonable degree of ballistic certainty" as an acceptable indication of the limits of an opinion, and cautioned that "[p]hrases that could give the jury an impression of greater certainty, such as 'practical impossibility' and 'absolute certainty' should be avoided."[61] Likewise, it ruled that "'reasonable degree of scientific certainty" is unacceptable because it suggests that forensic ballistics is a science, where it is clearly as much an art as a science."[62]

Fourth, the district court in *United States v. Ashburn*,[63] while declining to go as far as *Green* and *Glynn* in circumscribing source opinions, relied on the 2009 NAS Report and the criticisms of the AFTE sufficiency theory in the opinions discussed above to preclude "this expert witness from testifying that he is 'certain' or '100%' sure [or] that a match he identified is to 'the exclusion of all other firearms in the world,' or that there is a 'practical impossibility' that any other gun could have fired the recovered materials."[64] It limited the expert "to stating that his

[59] *Id*. at 548.

[60] 942 N.E.2d 927 (Mass. 2011),

[61] *Id*. at 946 (footnote omitted).

[62] *Id*.; *cf*. United States v. Cazares, 788 F.3d 956, 989 (9th Cir. 2015) (distinguishing between "scientific certainty" and "a reasonable degree of certainty in the ballistics field," and holding that the latter expression "is the proper expert characterization of toolmark identification"; the court did not consider whether a report of "practical impossibility" would be admissible).

[63] 88 F. Supp. 3d 239 (E.D.N.Y. 2015),

[64] *Id*. at 249.

conclusions were reached to a 'reasonable degree of ballistics certainty' or a 'reasonable degree of certainty in the ballistics field.'"[65]

Finally, in *Gardner v. United States*,[66] the District of Columbia Court of Appeals, without mentioning *Willock*, wrote that it was error to admit an examiner's "unqualified opinion."[67] The court cited "questions about pattern matching generally, and bullet pattern matching specifically, [that] surfaced in the scientific community."[68] Although the opinion condemned "absolute or 100% certainty," it did not specify the qualifications an examiner would have to place on source attributions, and it did not discuss the AFTE theory of sufficiency for "practical impossibility."[69]

To be clear, the cases collected here are exceptions to the normal, uncritical acceptance of firearm-mark testimony. And during this same period, other courts, in less detailed opinions, imposed no limitations on source attributions.[70] In all, the modern opinions on firearms source attribution uniformly hold that the similarities in the features can be presented (just as the earliest opinions on the subject did), and all but one allow an expert to provide some opinion on the source hypothesis. But what kind of an opinion that should be is being probed with increasing frequency. Although the still small number of critical cases are all over the map on how such

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[65] *Id*.

[66] 140 A.3d 1172 (D.C. 2016).

[67] *Id*. at 1184.

[68] *Id*. at 1183.

[69] *Id*.

[70] *E.g.*, United States v. Casey, 928 F.Supp.2d 397, 399-400 (D. Puerto Rico 2013) (although "defendant challenges [the] conclusion that [the examiner] is 100% certain . . . . [the court] remains faithful to the long-standing tradition of allowing the unfettered testimony of qualified ballistics experts"); United States v. Natson, 469 F.Supp.2d 1253, 1261–62 (M.D. Ga. 2007) (permitting forensic ballistics expert to offer an opinion of a match "to a 100% degree of certainty"); State v. Davidson, 509 S.W.3d 156, 205 (Tenn. 2017) ("It's like a fingerprint").

opinions can or should be presented, this developing line of authority does seem to reflect a growing judicial sense of unease about the AFTE theory of personal sufficiency and practical impossibility, and no firm support for the theory is apparent in legal commentary. To the contrary, legal commentators tend to criticize the modern opinions for not excluding all conclusions based on current methods for comparisons[71] or for allowing "extremely misleading" phrases for a degree of certitude in a source attribution.[72]

V. The 2016 PCAST Report

A third report from scientists outside of the firearms and toolmarks community generated even more consternation within that community and among law enforcement officials.[73] Late in 2016, the President's Council of Advisors on Science and Technology (PCAST) released a report

[71] *E.g.*, 4 DAVID L. FAIGMAN ET AL., MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY § 34 (2016-2017 ed.)). This treatise refers to "cases like *Green*, *Glynn*, and *Willock*" as "partial and somewhat unsatisfying" and "a mere band-aid, requiring experts to slightly soften the language in which they express their conclusions, but not requiring any more significant modifications, nor any concrete empirical evidence regarding error rates, nor objective metrics to guide comparisons." *Id*. § 34:5. KAYE ET AL., *supra* note 6, describes the *Monteiro* line of cases as allowing "the expert [to] give a looser opinion intended to connote that even if there is some chance of a matching weapon somewhere in the world, the bullet very likely passed through the barrel of the gun in the case at bar" and observes that "[w]hether even this weaker statement of local individualization satisfies *Daubert* and *Kumho Tire* is open to serious question . . . ." *Id*. § 15.2.4, at 685.

[72] GIANNELLI ET AL., *supra* note 1, § 14.06[d], at 780; *cf*. KAYE ET AL., *supra* note 6, § 15.2.4, at 685 ("'to a reasonable degree of scientific certainty' adds nothing meaningful to the opinion"); *id*. § 15.5 (Cum. Supp. 2016) ("Unless the source probability is demonstrably very close to one, so that a source attribution is defensible, nonnumerical expressions of source probability do not seem promising.").

[73] For discussion of early reactions of the forensic-science establishment, see David H. Kaye, *The National District Attorneys Association's Slam: PCAST "Usurps the Constitutional Role of the Courts,"* FORENSIC SCI., STAT. & L., Sept. 5, 2016, David H. Kaye, *The PCAST Report and Argumentum Ad Hominem*, FORENSIC SCI., STAT. & L., Sept. 24, 2016, http://for-sci-law.blogspot.com/2016/09/the-pcast-report-and-argumentum-ad.html; Adam B. Shniderman, *Prosecutors Respond to Calls for Forensic Science Reform: More Sharks in Dirty Water*, 126 YALE L.J. FORUM 348 (2017).

on "ensuring scientific validity of feature-comparison methods."[74] Like the two NAS reports, the PCAST report questions the AFTE theory of unstructured firearm-mark identification to a practical certainty. Indeed, it dismisses it as "clearly not a scientific theory," but rather "a claim that examiners applying a subjective approach can accurately individualize the origin of a toolmark" based on a "stated method" that "is circular."[75]

A. Validity of Traditional Firearm-mark Analysis

The report finds that, whatever the theory behind firearm-mark analysis may be, the AFTE procedure has yet to be validated. Finding 6 is blunt:

> PCAST finds that firearms analysis currently falls short of the criteria for foundational validity, because there is only a single appropriately designed study

[74] Executive Office of the President, PCAST, Report to the President on Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods, Sept. 2016 [hereinafter 2016 PCAST Report].

[75] *Id*. at 60. In a reply to PSAC, the Firearms and Toolmark Subcommittee of the Organization of Scientific Area Committees for Forensic Science argued that the notion of sufficiency as the criterion for individualization is not circular because

> The sufficient agreement threshold is exhibited when the amount of agreement is greater than best known non-matches established by the community and conveyed to each examiner through a lengthy and extensive training program. That is, it is not an arbitrary point. In fact, by definition, no non-matches can ever have more similarity than the sufficient agreement point.

Organization of Scientific Area Committees (OSAC), Firearms and Toolmarks Subcommittee, Response to the President's Council of Advisors on Science and Technology (PCAST) Call for Additional References Regarding its Report "Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods," Dec. 14, 2016, at 9, available at https://www.theiai.org/president/20161214_FATM_Response_to_PCAST.pdf. *Accord*, AFTE, Response to PCAST Report on Forensic Science, Oct. 31, 2016, https://afte.org/uploads/documents/AFTE-PCAST-Response.pdf. The idea is that examiners draw on a kind of internal database—an overall sense of the similarity of some set of the most closely matching pairs of items from different sources that they encountered when they were trained or in exercises since then. They compare their memory of the similarities in different-source specimens to the observed similarities in the current case. If the current pair is outside the remembered range for non-mates, they believe that it is logically impossible for the current pair to have originated from the same source ("by definition," that cannot occur). It seems doubtful that most courts would agree that this articulation provides the "specificity" required to avoid the kind of "circularity" or "inherent vagueness" that troubled the courts in *Taylor*, *Willock*, and *Glynn*.

> to measure validity and estimate reliability. The scientific criteria for foundational validity require more than one such study, to demonstrate reproducibility.[76]

This damning conclusion follows from the specific criteria that PCAST adopted for establishing what it called "foundational validity."[77] Finding (1) of the report explains that

> To establish foundational validity for a forensic feature-comparison method, the following elements are required: (a) a reproducible and consistent procedure for (i) identifying features in evidence samples; (ii) comparing the features in two samples; and (iii) determining, based on the similarity between the features in two sets of features, whether the samples should be declared to be likely to come from the same source ("matching rule"); and (b) empirical estimates, from appropriately designed studies from multiple groups, that establish (i) the method's false positive rate—that is, the probability it declares a proposed identification between samples that actually come from different sources and (ii) the method's sensitivity—that is, the probability it declares a proposed identification between samples that actually come from the same source.[78]

Among other things, the "scientific validation studies should . . . be conducted so that the examinees have no information about the correct answer."[79] Furthermore, for source conclusions that are not the product of a standardized, step-by-by procedure that involves "little or no judgment,"[80] PCAST insists on one (and apparently only one) approach to establishing foundational validity—"the method must be evaluated as if it were a 'black box' in the

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[76] 2016 PCAST Report, *supra* note 74, at 112; *see also id*. at 111 ("The scientific criteria for foundational validity require appropriately designed studies by *more than one group* to ensure reproducibility. Because there has been only a single appropriately designed study, the current evidence falls short of the scientific criteria for foundational validity."). The response from the OSAC subcommittee, *supra* note 75, at 2-5, maintains that other types of studies supply ample proof of validity. In an addendum to the 2016 report, PCAST reiterated that the designs of most of the other studies are too flawed to permit them be relied on to establish validity. PCAST, An Addendum to the PCAST Report on Forensic Science in Criminal Courts, Jan. 6, 2017, at 7 https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensics_addendum_finalv2.pdf (these studies "do not provide useful information about the actual reliability of firearms analysis"). It conceded that two additional studies, although still flawed, merited some consideration. *Id*.

[77] "Foundational validity" is not a standard phrase in metrology and statistics. "Validity" as PCAST defined it is discussed in KAYE ET AL., *supra* note 6, § 15.7.5(c) (Cum. Supp. 2017).

[78] 2016 PCAST Report, *supra* note 74, at 65.

[79] *Id*. at 66.

[80] *Id*. at 5 n.3.

examiner's head"[81] via "black-box studies that measure how often many examiners reach accurate conclusions across many feature-comparison problems involving samples representative of the intended use."[82]

By applying the *no*-information-about-the-correct-answer criterion, PCAST narrowed the number of "appropriately designed studies" to one unpublished experiment. [83] The "Ames Laboratory study"[84] was funded by the Department of Defense and reported in 2014. The 218 examiners who elected to participate "made . . . l5 comparisons of 3 knowns to 1 questioned cartridge case. For all participants, five of the sets were from known same-source firearms [known to the researchers but not the firearms examiners], and ten of the sets were from known different-source firearms."[85] Ignoring "inconclusive" comparisons, the performance of the examiners is shown in Table 1.

Table 1. Associations of Cartridge Cases to Handguns in the Ames Laboratory Performance Study (Baldwin 2014).

	~S	+S	
–E	1421	4	1425
+E	22	1075	1097

[81] *Id*. at 5.

[82] *Id*. at 66. For both objective and subjective methods, "[t]he studies must (a) demonstrate that the method is repeatable and reproducible and (b) provide valid estimates of the method's accuracy (that is, how often the method reaches an incorrect conclusion) that indicate the method is appropriate to the intended application." *Id*. at 5. "Repeatable" and "reproducible" are terms of art in metrology. "Repeatability describes the agreement within sets of measurements . . . where the same person uses the same equipment in the same way under the same conditions (including place and, as far as possible, time). Reproducibility . . . describes the agreement within a set of measurements . . . where different people, equipment, methods or conditions are involved." Mike Goldsmith, Nat'l Physical Laboratory, UK, Good Practice Guide No. 118, A Beginner's Guide to Measurement (2010), available at http://www.npl.co.uk/publications/a-beginners-guide-to-measurement.

[83] David P. Baldwin et al., A Study of False-positive and False-negative Error Rates in Cartridge Case Comparisons, Ames Laboratory, USDOE, Technical Report #IS-5207 (2014), at https://afte.org/uploads/documents/swggun-false-postive-false-negative-usdoe.pdf.

[84] 2016 PCAST Report, *supra* note 74, at 110. The Ames Laboratory is a Department of Energy national laboratory associated with Iowa State University. *Id*. at 11.

[85] Baldwin et al., *supra* note 83, at 10.

	1443	1079	
–E is a negative finding (the examiner decided there was no association). +E is a positive finding (the examiner decided there was an association). ~S indicates that the cartridges came from bullets fired by a different gun. +S indicates that the cartridges came from bullets fired by the same gun.			

The observed false-positive rate is 22/1443 = 1.52%.[86] Taken at face value, these results are encouraging. On average, examiners displayed high levels of accuracy, both for cartridge cases from the same gun (better than 99% specificity) and from different guns (better than 98% sensitivity). Firearms examiners are not reaching all these correct conclusions by chance. In addition, these figures apply to the classifications made by single examiners in isolation (assuming that all the participants completed the exercises by themselves). Having a second, independent examination and then reconciling any differences in the outcomes before reporting an association or exclusion should reduce the rates of error.

Even so, an examination of further details of the Ames study supports PCAST's doubts about relying on this one study to conclude that a wide cross-section of examiners can achieve high accuracy rates. To begin with, researchers enrolled 284 volunteer examiners in the study by sending out emails and announcements in newsletters.[87] Using volunteers often biases the results of an experiment.[88] Second, one-third of the volunteers did not submit answers,[89] so nonresponse bias is a further concern. Third, the volunteers who completed the tasks were told that that they were being tested to "benefit society by providing a better statistical evaluation of this common and important forensic discipline that will strengthen the legal system in its understanding of the

[86] The 95% confidence interval is 0.96% to 2.30%. Conversely, the observed true-positive rate is 98.48%. The 95% confidence interval is 97.7% to 99.04%.

[87] *Id*. at 8.

[88] *E.g.*, P. F. Pinsky et al., *Evidence of a Healthy Volunteer Effect in the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial*, 165 AM. J. EPIDEMIOLOGY 874 (2007).

[89] Baldwin et al., *supra* note 83, at 9.

value of firearms comparisons."[90] Finally, only type of firearm and ammunition was used,[91] and only impressions on cartridge cases were considered.

As this example suggests, a robust set of studies—with different selection methods and conditions—is required to establish validity across an entire domain.[92] But there are studies with other firearms that indicate that examiners can discern the matching item out of a set when they know that the set contains a cartridge case or bullet filed by the test gun. The 2016 report dismisses these as of no value in establishing validity because source attribution in this "closed set" situation does not lend itself to meaningful estimates of error rates and is much easier than making source attributions when the examiner does not know whether a bullet in the test set came from the gun.[93] The very small error rates reported from such studies grossly exaggerate accuracy, but they lend some support to the claim that the expertise demonstrated in the Ames study extends beyond the limited circumstances of that study.

Consequently, despite PCAST's concerted effort to supply definitive criteria for judicial findings of the requisite degree of scientific validity to admit the conclusions of subjective interpretations of perceived features,[94] courts could continue to find that a sufficient scientific

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[90] *Id*. at 25. On the one hand, they may have been motivated to perform exceptionally well because the wanted to show that their work is valuable. On the other hand, they may have been less motivated by the knowledge that it was just an experiment rather than a part of a criminal investigation and that no individual's mistakes would be revealed to laboratory management.

[91] The experimenters selected the inexpensive Ruger SR9 semiautomatic 9-mm Lugar centerfire pistol. *Id*. at 5 & 9. All the guns were new. The ammunition came from two lots made by one manufacturer. *Id*. at 9.

[92] *Cf*. HANS ZEISEL & DAVID H. KAYE, EMPIRICAL METHODS IN LAW AND LIGITATION ch. 5 (1997).

[93] Once an examiner picks the one true match, all the declarations of nonmatches are automatically correct. Experiments with other "set-to-set" designs have less internal dependencies but still fail to meet PCAST's no-information criterion.

[94] *See, e.g.*, 2016 PCAST Report, *supra* note 74, at 4 ("[L]egal standards and scientific standards intersect. Judges' decisions about the admissibility of scientific evidence rest solely on *legal* standards . . . . But, these decisions require making determinations about scientific validity. 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."); *id*. at 4-5 ("Foundational validity . . . is the

foundation for bullet-mark evidence exists even though the PCAST scientists did not. The report convincingly contends that "[n]othing—not training, personal experience nor professional practices—can substitute for adequate empirical demonstration of accuracy."[95] Nonetheless, there is still room to debate the threshold for an "adequate empirical demonstration."[96]

B. Error-rates for Firearm-mark Analysis

Apparently recognizing that its criteria for an adequate empirical foundation might be disputed, the PCAST report hedges its bet. The report acknowledges that "[w]hether firearms analysis should be deemed admissible based on current evidence is a decision that belongs to the courts,"[97] but urges that any courts that reject its pronouncements on scientific validity admit source attributions only when accompanied by quantitative estimates of the false-positive error rate as inferred from rigorous performance studies.[98]

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scientific concept we mean to correspond to the *legal* requirement, in Rule 702(c), of "reliable principles and methods.").

[95] *Id*. at 46 (italicized in original).

[96] Finding 6 concludes: "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)." In the Addendum PCAST continued to insist that "[f]rom a scientific standpoint, scientific validity should require at least two properly designed studies to ensure reproducibility," Addendum, *supra* note 77, at 7. But it conceded that there was some useful information in two other studies. It wrote that "[t]he issue for judges is whether one properly designed study, together with ancillary evidence from the two imperfect studies, adequately satisfies the legal criteria for scientific validity." *Id*. Firearms examiners maintain that many other studies noted but deemed inappropriate in the 2016 report comprise important evidence. OSAC Subcommittee response, *supra* note 75.

[97] 2016 PCAST Report, *supra* note 74, at 112.

[98] *Id*. at 112. The meaning of 95 percent confidence is subtle (and the description in the 2016 report is incorrect. David H. Kaye, *PCAST's Sampling Errors (Part I)*, FORENSIC SCI., STAT. & L., Oct. 24, 2016, http://for-sci-law.blogspot.com/2016/10/pcasts-sampling-errors.html). As indicated *supra* note 85, another way to report the same estimate of a false declaration of a match when the materials tested did not come from the same gun is that this interval goes from the 0.96% to 2.30%. For notes on some of the difficulties with PCAST's approach to estimating false-positive probabilities as measures of probative value in a particular case, see David H. Kaye, *PCAST's Sampling Errors (Part II: Getting More Technical)*, FORENSIC SCI., STAT. & L., Dec. 11, 2016, http://for-sci-law.blogspot.com/2016/12/pcasts-sampling-errors-part-ii-getting.html; David H. Kaye, *PCAST and the Ames Bullet Cartridge Study: Will*

But applying such numbers to individual examiners and particular cases is more challenging than the report recognizes. It is one thing to show that, as a group, some set of examiners can reach correct conclusions (in comparisons that they do not regard as inconclusive). It is another to accurately estimate the probability of an error for a given examiner in a particular comparison.[99] Indeed, the 2016 report notes that "20 of the 22 false positives were made by just 5 of the 218 examiners — strongly suggesting that the false positive rate is highly heterogeneous across the examiners";[100] however, the report does not discuss the implications of this heterogeneity for testimony about "the error rates" that it wants "clearly presented."[101] It calls for "rigorous proficiency testing" of the examiner and disclosure of those test results.[102] There is a substantial argument for admitting both performance-test-based estimates of error

the Real Error Rates Please Stand Up?, FORENSIC SCI., STAT. & L., Nov. 1, 2016, http://for-sci-law.blogspot.com/2016/11/pcast-and-ames-study-will-real-error.html.

[99] This caveat does not mean that an average error rate in a study is irrelevant, or that only examiner-specific "proficiency tests" on casework-like samples of the same level of difficulty (in which examiner judgments also are analyzed as the output of a black-box system) are relevant. It is sensible to rely on average figures when nothing better is at hand (and to consider them in conjunction with an individual-specific error-rate even when one is available). *See generally* Dominique Fourdrinier & Martin T. Wells, *On Improved Loss Estimation for Shrinkage Estimators*, 27 STAT. SCI. 61 (2012); Hermanus H. Lemmer, *Shrinkage Estimators*, *in* ENCYCLOPEDIA OF STATISTICAL SCIENCE (Samuel Kotz & Campbell B. Read eds., 2d ed. 2006).

[100] 2016 PCAST Report, *supra* note 74, at 112.

[101] Baldwin et al. cautioned that

> [F]or the pool of participants used in this study the fraction of false positives was approximately 1%. The study was specifically designed to allow us to measure not simply a single number from a large number of comparisons, but also to provide statistical insight into the distribution and variability in false-positive error rates. The . . . overall fraction is not necessarily representative of a rate for each examiner in the pool. Instead, . . . the rate is a highly heterogeneous mixture of a few examiners with higher rates and most examiners with much lower error rates. This finding does not mean that 1% of the time each examiner will make a false-positive error. Nor does it mean that 1% of the time laboratories or agencies would report false positives, since this study did not include standard or existing quality assurance procedures, such as peer review or blind reanalysis.

Baldwin et al., *supra* note 83, at 18.

[102] 2016 PCAST Report, *supra* note 74, at 111.

rates, but the report does not develop the idea. [103] PCAST's discussion of a false-positive rate from a study designed to show whether examiners as a group are generally capable of reaching correct results (without verification) should not be taken as a final word on how to estimate error rates for courtroom use.[104]

VI. The Future

It seems unlikely that the PCAST report will result in the widespread judicial rejection of largely subjective comparisons.[105] But the recommendations and conclusions of yet a third body of accomplished scientists should intensify judicial reservations about testimony that the "chance of error [is] so remote as to be a 'practical impossibility.'"[106] If the report has this effect, the issue of how to present the evidence becomes more critical. As previously noted, phrases like "reasonable ballistic certainty" and "more likely than not" are not the solution.[107] Three more

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[103] *See supra* note 99.

[104] Verification by a second examiner also is relevant to presenting or using an error rate. As previously noted, if the errors occur independently across examiners (as might be the case if the verification is truly blind), then the relevant false-positive error rate from the Ames study drops to $(1.52\%)^2 = 0.0231\%$.

[105] There are no published opinions on whether the analysis in the report warrants exclusion of firearm-mark evidence. In *United States v. Chester*, No. 13 CR 00774, 2017 WL 3394746 (N.D. Ill. Oct. 7, 2016), the district court thought (oddly) that the report merely "provides foundational scientific background and recommendations for fur further study [and] does not dispute the accuracy or acceptance of firearm toolmark analysis within the courts." *Id*. at 1-2. In addition, the court wrote that the error rates in the Ames study and one of the other ones discussed in the report were "sufficiently low." *Id*. at 2.

[106] 2016 Report, *supra* note 74, at 145 (recommending that

> courts should never permit scientifically indefensible claims such as: "zero," "vanishingly small," "essentially zero," "negligible," "minimal," or "microscopic" error rates; "100 percent certainty" or proof "to a reasonable degree of scientific certainty;" identification "to the exclusion of all other sources;" or a chance of error so remote as to be a "practical impossibility.").

"Practical impossibility" and "practical certainty" are signature phrases for firearms examiners. *See supra* notes 12 & 43; *see also* AFTE, *supra* note 75, at 1 ("examiners employing standard, validated procedures will rarely, *if ever*, commit false identifications or false eliminations.") (emphasis added).

[107] *See supra* notes 71-72 & accompanying text; KAYE ET AL., *supra* note 6, § 15.2.5:

> Allowing testimony to "a reasonable degree of ballistic (or some such) certainty," however. is a fig leaf that does not provide decent modesty. The witness often is

promising approaches are worth noting. If operating within the current paradigm of experience-and-training-based holistic conclusions, experts should not claim to be applying distinctly *scientific* methods for interpreting measurements or observations.[108] To follow the AFTE logic, they could explain that they have been trained in comparing the variations in the marks left by a gun, and that the marks seem to diverge from the normal range that they recall—but that they have no quantitative knowledge of the variation that normally exists when bullets are fired from the same gun as opposed to different guns.[109] And, any conclusion that the excess variation means that marks on the questioned item came from the known gun should be accompanied by meaningful error probabilities.

This kind of presentation corresponds to the "black box" perspective on the process. The examiner is treated no differently than a mysterious computer program that classifies questioned items into two categories—same gun, or different guns. The marks are the input or stimulus; a 1 (same gun) or 0 (different gun) is the output or response.[110] For the purpose of trusting the categorical conclusion, *how* the examiner performs the classification is not crucial.[111] The

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> presented as a scientist, applying a scientific method and using scientific terms. The phrase "to a reasonable degree of scientific certainty" adds nothing meaningful to the opinion of such a witness, and extirpating the phrase does not go far toward closing the distance between a firm opinion and a well-warranted one.

[108] *See* Kaye, *supra* note 20.

[109] As such, they should not use the phrases like "individual marks." *Cf.* KAYE ET AL., *supra* note 6, § 15.7.1(c) ("The demand that the forensic science community perpetuate the time-honored but intellectually unsatisfying theory of individual versus class characteristics is unfortunate."). "Class characteristics" are acquired via a manufacturing or other process that is known to be uniform enough to produce many items with that characteristic. Other characteristics are acquired via a more variable process that produces fewer items with the same characteristic, but no law of nature dictates that an "individual characteristic" exists in one and only one item.

[110] I am putting to the side a refusal to reach a clear conclusion by declaring that the evidence is inconclusive.

[111] That a classification procedure is based on a valid theory lends credence to the results, and it affects how extensively the process needs to be tested, but the theory is not a substitute for empirical testing of the procedure or its components.

"operating characteristics" of the examiner as a source detector,[112] if adequately studied, are sufficient. Broadly speaking, this is the PCAST perspective on validation and presentation of traditional testimony.

However, it is not necessary for the examiner to be an inscrutable detector that registers either a same-gun signal or its absence as a 1 or a 0. Many forensic scientists and statisticians favor a second mode of presentation in which the examiner describes (1) how often the perceived degree of agreement between the questioned specimen and those from the test firings would be seen if all the specimens came from the same gun and (2) how often such similarity would be seen if the questioned specimens came from a different gun.[113] The extent to which (1) exceeds (2) indicates how much the evidence supports the same-source conclusion as opposed to the different-source conclusion.[114] Describing the strength of the evidence in this manner—without any categorical conclusion from the expert's mind—is an attractive alternative to conventional testimony.[115] A firearms analyst should be able to articulate the "likelihoods"—the rough probabilities of the marks given each hypothesis about the source and the basis for these judgments about the evidence. Assessing the likelihoods is the expertise that lay jurors lack and that is supposed to come with training and experience in the field. But jurors can decide which

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[112] For discussion of operating characteristics of a statistical classification procedure, see, for example, THOMAS D. WICKENS, ELEMENTARY SIGNAL DETECTION THEORY (2002); NAT'L RESEARCH COUNCIL, COMM. ON EVALUATION OF SOUND SPECTROGRAMS, ON THE THEORY AND PRACTICE OF VOICE IDENTIFICATION 27–30 (1979).

[113] *See, e.g.*, BERNARD ROBERTSON ET AL., INTERPRETING EVIDENCE: EVALUATING FORENSIC SCIENCE IN THE COURTROOM (2d ed. 2016); European Network of Forensic Science Institutes, ENFSI Guideline for the Formulation of Evaluative Reports in Forensic Science (2015); Ian W. Evett et al., *Finding the Way Forward for Forensic Science in the US—A Commentary on the PCAST Report*, 278 Forensic Sci. Int'l 16 (2017); Geoffrey Stewart Morrison et al., *A Comment on the PCAST Report: Skip the "Match"/"Non-match" Stage*, 272 Forensic Sci. Int'l e7 (2017) (letter); *supra* note 47.

[114] *E.g.*, KAYE ET AL., *supra* note 6, § 14.2; David H. Kaye, Review-essay, *Digging into the Foundations of Evidence Law*, 116 MICH. L. REV. 915 (2017).

[115] Of course, proof that examiners' judgments of the weight of evidence are reasonably accurate is necessary. *E.g.*, Kaye, *supra* note 20.

likelihood ratios are large enough to warrant a source attribution as well as firearms experts can.[116] When experts take over that task, they end up presenting radically different conclusions for marks that are just shy of their implicit and unarticulated cutoff for source attribution than for marks that are barely over their threshold.[117]

The preceding two approaches are still predominantly subjective. In the longer term, we can and should expect expert testimony to be informed by statistical data about the frequency of types of marks on bullets or cartridge cases as determined from reference databases.[118] Three-dimensional imaging methods allow automated feature extraction.[119] With data on the distributions of similarity scores in items from the same gun and items from different ones, statistical models can generate quantitative likelihood ratios.[120] Such systems are statistically reliable (the same inputs generate the same outputs), and they can be validated empirically by investigating their performance on different data sets. Progress in these endeavors will enable firearms examiners to speak more fittingly of the "The Science Behind Firearm and Tool Mark Examination."[121]

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[116] *Cf.* David H. Kaye, *Likelihoodism, Bayesianism, and a Pair of Shoes*, 53 JURIMETRICS J. 1 (2012) (footwear-mark testimony).

[117] *E.g.*, ROBERTSON ET AL., *supra* note 113; Morrison et al., *supra* note 113.

[118] In 2016, the National Institute of Standards and Technology established such a database. NIST Ballistics Toolmark Database, Dec. 20, 2017, https://www.nist.gov/programs-projects/nist-ballistics-toolmark-database.

[119] *E.g.*, Daniel Ott et al., *Identifying Persistent and Characteristic Features in Firearm Tool Marks on Cartridge Cases*, 5 SURFACE TOPOGRAPHY: METROLOGY & PROPERTIES (2017), http://iopscience.iop.org/article/10.1088/2051-672X/aa864a.

[120] *E.g.*, Fabiano Riva & Christophe Champod, *Automatic Comparison and Evaluation of Impressions Left by a Firearm on Fired Cartridge Cases*, 59 J. FORENSIC SCI. 1556 (2014).

[121] Nancy Ritter, The Science Behind Firearm and Tool Mark Examination, Oct. 2014, https://nij.gov/journals/274/Pages/firearm-toolmark-examination.aspx.

Federal PCAST Decisions

From: "Antell, Kira M. (OLP)" <(b) (6)
To: "Hunt, Ted (ODAG)" <(b) (6)
Date: Mon, 26 Feb 2018 11:39:56 -0500
Attachment United State v Ca au pdf (76 36 kB); United State v North pdf (87 4 kB); United State v Bond pdf (88.54 kB)

Hi Ted,

Attached

K

Kira Antell
Senior Counsel
Office of Legal Policy
U.S. Department of Justice
950 Pennsylvania Avenue, NW
Washington, DC 20530
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2017 WL 6729619
Only the Westlaw citation is currently available.
United States District Court,
D. Colorado.

UNITED STATES of America, Plaintiff,
v.
9. Ambrose CASAUS, Defendant.

Criminal Case No. 14-cr-00136-CMA-09
|
Signed 12/29/2017

Attorneys and Law Firms

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Opinion

ORDER TO DENYING DEFENDANT'S MOTION TO EXCLUDE LATENT FINGERPRINT IDENTIFICATION EVIDENCE

CHRISTINE M. ARGUELLO, United States District Judge

***1** This matter is before the Court on Defendant Casaus's Motion to Exclude Latent Fingerprint Identification Evidence (Doc. # 517). Essentially, Defendant Casaus asks this Court to find that the fingerprint methodology used by the FBI, commonly known as the ACE-V method, is per se unreliable and therefore inadmissible. Keeping in line with the majority of courts to have addressed this issue, the Court denies the motion.

I. LAW

Fed. R. Evid. 702 imposes on a district court a gatekeeper obligation to "ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable." *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 589 (1993). "Rule 702, both before and after *Daubert*, was intended to relax traditional barriers to admission of expert opinion testimony." *Cook v. Rockwell Int'l Corp.*, 580 F. Supp. 2d 1071, 1082 83 (D. Colo. 2006).

Rule 702 provides that a witness who is qualified as an expert by "knowledge, skill, experience, training, or education" may testify if:

> (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
>
> (b) the testimony is based on sufficient facts or data;
>
> (c) the testimony is the product of reliable principles and methods; and
>
> (d) the expert has reliably applied the principles and methods to the facts of the case.

Fed. R. Evid. 702. The proponent of a challenged expert must demonstrate by a preponderance of the evidence that the testimony and opinion is admissible. *United States v. Nacchio*, 555 F.3d 1234, 1241 (10th Cir. 2009).

In determining whether expert testimony is admissible, the Court generally employs a three-step process. First, it must first determine whether the expert is qualified "by knowledge, skill, experience, training, or education" to render an opinion. *Id.* at 124. Second, if the expert is sufficiently qualified, the Court must determine whether the proposed testimony is sufficiently "relevant to the task at hand," such that it "logically advances a material aspect of the case." *Norris v. Baxter Healthcare Corp.*, 397 F.3d 878, 884, 884 n.2 (10th Cir. 2005). "Doubts about whether an expert's testimony will be useful should generally be resolved in favor of admissibility unless there are strong factors such as time or surprise favoring exclusions. The jury is intelligent enough to ignore what is unhelpful in its deliberations." *Robinson v. Mo. Pac. R.R. Co.*, 16 F.3d 1083, 1090 (10th Cir. 1994) (quotation omitted).

Third, the Court examines whether the expert's opinion "has 'a reliable basis in the knowledge and experience of his [or her] discipline.' " *Id.* (quoting *Daubert*, 509 U.S. at 592). Guided by these principles, this Court has "broad discretion" to evaluate whether an expert is helpful, qualified, and reliable under F.R.E. 702. *United States v. Velarde*, 214 F.3d 1204, 1208-09 (10th Cir. 2000).

II. ANALYSIS

***2** Defendant Casaus does not dispute the Government's fingerprint expert's qualifications, nor does he argue that the fingerprint evidence is irrelevant. Instead, he focuses only on the general reliability of fingerprint examinations using the ACE-V method.

To support his contentions that the ACE-V method is per se unreliable, Defendant Casaus relies heavily on a 2016 report created by President Obama's **Council of Advisors on Science** and Technology, wherein the Council criticized latent fingerprint examinations. This Court, however, is bound by established Tenth Circuit precedent concluding otherwise that fingerprint comparison is a reliable method of identifying persons and one that courts have consistently upheld against a *Daubert* challenge. *United States v. Avitia-Guillen*, 680 F.3d 1253, 1260 (10th Cir. 2012); *United States v. Baines*, 573 F.3d 979, 990 91 (10th Cir. 2009) (noting "[f]ingerprint identification has been used extensively by law enforcement agencies all over the world for almost a century," has an "impressively low" error rate, and has achieved "overwhelming acceptance" by experts in the field); *United States v. Gutierrez-Castro*, 805 F. Supp. 2d 1218, 1231 (D.N.M. 2011) (finding that the ACE-V fingerprint method is sufficiently reliable to be admissible); *see also United States v. Crisp*, 324 F.3d 261 (4th Cir. 2003) (concluding fingerprint identification satisfied *Daubert*); *United States v. Hernandez*, 299 F.3d 984 (8th Cir. 2002) (same); *United States v. Havvard*, 260 F.3d 597, 601 (7th Cir. 2001) (same).

Although the Court understands that further research and intellectual scrutiny into the reliability of fingerprint evidence would be "all to the good," *Baines*, 573 F.3d at 992, the Court agrees with the conclusion of the Tenth Circuit that "to postpone present in-court utilization of this 'bedrock forensic identifier' pending such research would be to make the best the enemy of the good." *Id.* Indeed, "*Daubert* ... demands only that the proponent of the evidence show that the expert's conclusion has been arrived at in a scientifically sound and methodologically reliable fashion." *Ruiz-Troche v. Pepsi Cola of Puerto Rico Bottling Co.*, 161 F.3d 77, 85 (1st Cir. 1998). After considering the arguments set forth in the Government's Response, the Court finds that the Government has met this burden.

Moreover, Defendant Casaus does not point out any specific pitfalls or concerns with respect to the fingerprint examination conducted in this case and, as mentioned, provides no argument or authority to support that the Government's expert is somehow unqualified to have conducted her examination. *See Avitia-Guillen*, 680 F.3d at 1260 ("Defendant ... pointed to nothing in the record indicating [the expert] deviated from normal, reliable fingerprint comparison methods.").

III. CONCLUSION

For the foregoing reasons, the Court denies Defendant Casaus's Motion to Exclude Latent Fingerprint Identification Evidence. (Doc. # 517.)

All Citations

Slip Copy, 2017 WL 6729619

Footnotes

1 The Court notes that the Defendant did not request a hearing on this issue. The Court nonetheless finds that a hearing, which is not required, is not necessary in this case. *Burlington N. & Santa Fe Ry. Co. v. Grant*, 505 F.3d 1013, 1031 (10th Cir. 2007) ("Generally, the district court performs this function at a *Daubert* hearing, although such a hearing is not specifically required.").

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United States District Court,
N.D. Georgia, Atlanta Division.

UNITED STATES of America,
v.
Jeff NORTH, Defendant.

1:16-cr-309-WSD
|
Signed 11/17/2017

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James Wesley Bryant, Federal Defender Program Inc., Atlanta, GA, for Defendant.

Opinion

OPINION AND ORDER

WILLIAM S. DUFFEY, JR., UNITED STATES DISTRICT JUDGE

***1** This matter is before the Court on Defendant Jeff North's ("Defendant") Motion to File Out of Time ("Motion to File") [94] and Motion to Preclude Gun-Shot Residue Analysis Opinion Evidence (the "Daubert Motion") [94.1].

I. BACKGROUND

On May 26, 2016, a grand jury in the Northern District of Georgia returned a three-count indictment [13] charging Defendant with Carjacking in violation of 18 U.S.C. § 2119(1) (Count 1); Discharging a Firearm During a Federal Crime of Violence in violation of 18 U.S.C. §§ 924(c)(l)(A)(i), (ii), and (iii) (Count 2); and Possession of a Firearm by a Convicted Felon in violation of 18 U.S.C. §§ 922(g)(1) and 9224(e) (Count 3). The Indictment alleges that, on or about March 23, 2015, Defendant shot Johnny Dansby and stole his vehicle.

On March 23, 2015, swabs from Defendant's hands were submitted to the Georgia Bureau of Investigation, Division of Forensic Sciences for a gunshot residue ("GSR") analysis. The sealed samples were later analyzed by Microanalyst Alexander Covin. Mr. Covin completed an official report detailing the method of analysis, results, and conclusions. ([97.1]). Mr. Covin's primary trainer and Manager and Acting Director of the Trace Evidence Section, Michael McCarriagher, independently reviewed the evidence, report, and all associated documentation. (Id.).

The GSR report was provided to Defendant at his arraignment hearing on September 9, 2016. The report states that the samples taken from Defendant's hands were tested for the presence of particles characteristic of GSR. It details the test method used ("scanning electron microscopy/energy dispersive x-ray spectroscopy") and summarizes the results (the examination "revealed three particles characteristic of GSR"). It also summarized the analysts' opinion that the examination of the samples:

> revealed the presence of particles characteristic of [GSR]. This supports the possibility that the individual discharged a firearm, was in close proximity to a firearm upon discharge, or came into contact with an item whose surface bears GSR.

([97.1]).

On September 20, 2017, the Court ordered [69] that this case be placed on the Court's December 5, 2017 trial calendar. The Court further ordered that the parties file, by October 16, 2017, motions *in limine* and motions to exclude evidence or testimony.

On October 20, 2017, the Government officially noticed Mr. McCarriagher and Mr. Covin as experts who would testify in the area of gunshot residue and provided copies of their CVs. The Government also provided backup notes, data, and other information. (See [97.4]).

On November 13, 2017, Defendant filed his Motion to File, [94] in which he moved for leave to file the Daubert Motion beyond the October 16, 2017, deadline. The Defendant attached his Daubert Motion [94.1] to the Motion to File. In his Daubert Motion, Defendant argues that the Government's disclosures related to the GSR analysis fail to comply with Rule 16 of the Federal Rules of Criminal Procedure. He also seeks discovery and a hearing regarding the admissibility of Mr.

McCarriagher's testimony under Rule 702 of the Federal Rules of Evidence.

***2** By docket entry on November 13, 2017, the Court ordered that the Government respond to the Motion to File by noon on November 16, 2017.

On November 16, 2017, the Government responded to the Daubert Motion. (See [97]).

On November 17, 2017, Defendant filed his Reply [100].

II. DISCUSSION

The Daubert Motion is currently before the Court. Defendant seeks a hearing on the admissibility of Mr. McCarriagher's testimony regarding the presence of gunshot residue on Defendant on the grounds that the Government's expert is not qualified to offer his opinion and the opinions are otherwise inadmissible under Federal Rule of Evidence 702. Defendant also requests discovery on the tests used, including "a summary as required by Rule 16 of the Federal Rules of Criminal Procedure."

A. Legal Standard

Rule 16(a)(1)(G) of the Federal Rules of Criminal Procedure "imposes specific disclosure requirements on the government with regards to expert witnesses that the government plans to utilize at trial." United States v. Holland, 223 Fed.Appx. 891, 893 (11th Cir. 2007). The rule provides, in pertinent part, that, "[a]t the defendant's request, the government must give to the defendant a written summary of any [expert] testimony that the government intends to use." Id. The "summary" provided by the government must include the expert witness's "opinions, the bases and reasons for those opinions, and the witness's qualifications." Id. The commentary to the Rule further provides that the government's summary "should cover not only written and oral reports, tests, reports, and investigations, but any information that might be recognized as a legitimate basis for an opinion...." Id., Advisory Comm. Notes, 1993 Amendment.

Expert opinion testimony is governed by Rule 702 of the Federal Rules of Evidence and Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993). Under Rule 702, expert testimony is admissible if: (1) the expert is qualified to testify regarding the subject matter of his testimony; (2) the methodology that the expert used to reach his conclusions is sufficiently reliable; and (3) the expert's testimony will assist the trier of fact in understanding the evidence or in determining a fact at issue. United States v. Scott, 403 Fed.Appx. 392, 397 (11th Cir. 2010) (citing United States v. Frazier, 387 F.3d 1244, 1260 (11th Cir. 2004)) (en banc); Fed. R. Evid. 702. The Government has the burden to meet each of the admissibility requirements. See Scott, 403 Fed.Appx. at 397-98.

The second prong requires the district court to make a preliminary determination on whether the expert's methodology is reliable. Scott, 403 Fed.Appx. at 397. In Daubert, the Supreme Court provided a non-exclusive list of factors for the district court to consider:

> (1) whether the expert's theory can be and has been tested; (2) whether the theory has been subjected to peer review and publication; (3) the known or potential rate of error of the particular scientific technique; and (4) whether the technique is generally accepted in the scientific community.

Frazier, 387 F.3d at 1262. These factors are only general guidelines, and the trial judge has "considerable leeway in deciding in a particular case how to go about determining whether particular expert testimony is reliable." Kumho Tire Co., Ltd. v. Carmichael, 526 U.S. 137, 152 (1999).

***3** A court may conduct a hearing on a Daubert motion, but one is not automatically granted. See Corwin v. Walt Disney Co., 475 F.3d 1239, 1252 n.10 (11th Cir. 2007) ("although they are often helpful, [Daubert] hearings are not prerequisite to such determinations under the Federal Rules or established law"); Cook ex rel. Estate of Tessier v. Sheriff of Monroe County, 402 F.3d 1092, 1113 (11th Cir. 2005) (noting that trial court was under no obligation to hold a Daubert hearing, although such hearings may be helpful in complicated cases involving multiple experts).

B. The Government's Disclosures Comply With Rule 16

The pretrial disclosure provided by the Government includes a clear summary of the method of analysis, results, and opinions. The GSR report was provided

to Defendant at his arraignment hearing on September 9, 2016. It discloses that the evidence analyzed was a "[s]ealed GSR collection kit identified as containing samples from the hands of Jeff North." ([97.1]). The report concluded that "three particles characteristic of GSR" were revealed on the sample, supporting the analyst's opinion that "the individual discharged a firearm, was in close proximity to a firearm upon discharge, or came into contact with an item whose surface bears GSR." (Id.). It further states that the "method of analysis" used to arrive at this conclusion was by "scanning electron microscopy/energy dispersive x-ray spectroscopy (SEM/EDS) and analyzed for elemental composition and particle morphology." (Id.). The report notes that the "evidence, report and all associated documentation have been reviewed by primary trainer, Michael McCarriagher." (Id.). The Government also provided copies of Mr. McCarriagher's and Mr. Covin's CVs. (See [97.2-3]). Finally, the Government supplied thirty additional pages of notes and underlying data. (See [97.4]).

The Government met its pretrial disclosure obligations under Rule 16. United States v. Campbell, No. 1:04-CV-0424-RWS, 2006 WL 346446, at *1 (N.D. Ga. Feb. 13, 2006) ("Rule 16 does not mandate a comprehensive recitation of every nuance and detail that will make up an expert's testimony, or which may be drawn out on cross-examination.").

C. Expert Discovery and a Daubert Hearing Are Unnecessary

Defendant requests discovery and a hearing on the admissibility of expert opinions related to the GSR report. A hearing is not required every time a party raises a Daubert objection. See Corwin v. Walt Disney Co., 475 F.3d 1239, 1252 n.10 (11th Cir. 2007); Cook ex rel. Estate of Tessier v. Sheriff of Monroe County, 402 F.3d 1092, 1113 (11th Cir. 2005).

Here, the Government has proffered sufficient information to allow this Court to qualify Mr. McCarriagher in his area of expertise. It set forth how it plans to present Mr. McCarriagher's qualifications, training, experience, and the methodology employed in conducting his analysis and reaching his conclusions. (See [97] at 7-8). The Court is satisfied that Mr. McCarriagher has the requisite experience and training to offer opinions on the presence of GSR. "Over the course of [Mr.] McCarriagher's ten-plus years as a forensic scientist, he has conducted more than 1,200 GSR analyses and he has testified in court and been qualified as a GSR expert approximately eighty times." ([97] at 7).

Applying the Daubert criteria, the Court finds that Mr. McCarriagher's opinion is reliable. Defendant does not cite any authorities or other information that the GSR analysis is unreliable, non-scientific, or that it does not have broad acceptance in the forensic community. Defendant mentions "[t]hree reports issued in 2008, 2009, and 2016 ... have called into question the reliability of many forensic 'sciences' previously admitted without much doubt." ([100] at 2-3). Defendant does not demonstrate that these reports cast cognizable doubt on the reliability of Mr. McCarriagher's method. [2] Defendant also does not rebut other cases submitted by the Government in which courts have admitted expert testimony regarding GSR testing similar to that which it intends to be offered at this trial in this case. See, e.g., United States v. Flowers, 235 Fed.Appx. 965, 967 (4th Cir. 2007); United States v. Eldridge, 2013 WL 6096520, at *7-8 (W.D.N.Y. Nov. 20, 2013).

***4** To the extent that Defendant seeks to attack the credibility and accuracy of the results of the GSR analysis, these matters can be the subject of "vigorous cross examination, presentation of contrary evidence, and careful instructions on the burden of proof." Daubert, 509 U.S. at 596. [3]

III. CONCLUSION

For the foregoing reasons,

IT IS HEREBY ORDERED that Defendant's Motion to File Out of Time [94] is **DENIED AS MOOT.**

IT IS FURTHER ORDERED that the Defendant's Motion to Preclude Gun-Shot Residue Analysis Opinion Evidence [94.1] is **DENIED.**

SO ORDERED this 17th day of November, 2017.

All Citations

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Footnotes

1 Defendant's Daubert Motion addresses testimony from Mr. Covin at trial. The Government "intends to call [Mr.] McCarriagher to testify in the Government's case in chief" and currently does not expect to call Mr. Covin. This Order will address Defendant's objections to Mr. Covin as if they were to Mr. McCarriagher.

2 See, e.g., President's **Council of Advisors on Science** and Technology, Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods 104 (September 2016) (questioning reliability of examiners' "attempt to determine whether ammunition is or is not associated with a specific firearm based on toolmarks produced by guns on the ammunition"—not primer residue analysis).

3 Defendant has failed to justify the expense and delay caused by pretrial discovery, especially given that Defendant was aware of the GSR report for over a year.

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United States District Court,
N.D. Illinois, Eastern Division.

UNITED STATES of America
v.
Myshawn BONDS

No. 15 CR 573-2
|
Signed 10/10/2017

Attorneys and Law Firms

AUSA, Jordan Melissa Palmore, United States Attorney's Office, Chicago, IL, Pretrial Services, for United States of America.

Opinion

OPINION AND ORDER

SARA L. ELLIS, United States District Judge

***1** Defendant Myshawn Bonds is charged with two counts of bank robbery in violation of 18 U.S.C. § 2113(a). The government alleges that on August 25, 2015, Bonds robbed a Chase Bank in Joliet, Illinois of $4,682, and that on September 11, 2015, he robbed a BMO Harris Bank in Carpentersville, Illinois of $2,247. In preparation for trial, Bonds has filed a motion seeking to exclude the government's expert testimony regarding fingerprint analysis pursuant to Federal Rule of Evidence 702, contending the method used is not sufficiently reliable foundationally or as applied to his case. Because the Court finds the government's proposed fingerprint expert testimony meets Rule 702's requirements, with Bonds' concerns going to weight and not admissibility, the Court denies Bonds' motion.

BACKGROUND

The government has disclosed to the defense that, at trial, it intends to present the testimony of FBI forensic examiner Kira Glass as an expert in the field of latent fingerprint analysis. The government's expert disclosures indicate that Glass will testify concerning fingerprint analysis in general, including the development of latent fingerprints and how such latent fingerprints can be used for identification when compared with an individual's known prints. She specifically will testify about the ACE-V (analysis, comparison, evaluation, and verification) method of fingerprint identification. The ACE-V method "is the standard method for determining whether two fingerprints are from the same person." *United States v. Herrera*, 704 F.3d 480, 484 (7th Cir. 2013). The method involves the following: (1) analysis of the unknown latent print to assess the quality and quantity of detail present; (2) comparison of the latent print to known prints to determine details that correspond; (3) evaluation of the two prints to determine if there is sufficient detail in agreement for an identification or in disagreement to exclude the known print; and (4) verification by another qualified examiner, repeating the observations between the latent and known print and coming to the same conclusion, although the second examiner may be aware of the first examiner's conclusion. *Id.* (citing National Research Council of the National Academy of Sciences, *Strengthening Forensic Science in the United States: A Path Forward* 137 38 (2009)).

Using the ACE-V method, Glass examined demand notes presented during both the Joliet and Carpentersville bank robberies. She is expected to testify that four latent prints recovered from the Joliet demand note and two latent prints recovered from the Carpentersville demand note match the known print standard for Bonds.

LEGAL STANDARD

The admissibility of expert opinion testimony is governed by Federal Rule of Evidence 702 and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L.Ed. 2d 469 (1993). *See Bielskis v. Louisville Ladder, Inc.*, 663 F.3d 887, 893 (7th Cir. 2011). Rule 702 provides that a witness qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of opinion or otherwise provided that "(a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (b) the testimony is based on sufficient facts or data; (c) the testimony is the product of reliable principles and methods; and (d) the expert has reliably applied the principles and methods to the facts of the case." Fed. R. Evid. 702. To admit expert

testimony under this rule, the Court must determine that (1) the witness is qualified, (2) the expert's methodology is reliable, and (3) the testimony will assist the trier of fact to understand the evidence or to determine a fact in issue. *Myers v. Ill. Cent. R.R. Co.*, 629 F.3d 639, 644 (7th Cir. 2010). The Rule 702 inquiry "is a flexible one," however. *Daubert*, 509 U.S. at 594. "Determinations on admissibility should not supplant the adversarial process; 'shaky' expert testimony may be admissible, assailable by its opponents through cross-examination." *Gayton v. McCoy*, 593 F.3d 610, 616 (7th Cir. 2010). The proponent of the testimony bears the burden of proving that the proffered testimony meets these requirements, and the Seventh Circuit grants the district court "wide latitude in performing its gate-keeping function." *Bielskis*, 663 F.3d at 894.

ANALYSIS

I. Reliability of ACE-V Method

***2** Bonds first argues that the ACE-V method should be excluded because it is not a proven, foundationally valid scientific method. Initially, the Court notes that fingerprint evidence need not be a proven *scientific* method to qualify for admissibility as expert evidence. While *Daubert* initially was framed as applying only to scientific evidence, it applies more broadly to all "testimony based on 'technical' and 'other specialized' knowledge," with *Daubert*'s reliability factors applying flexibly depending on the specific issues presented by the testimony under consideration. *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 141, 119 S. Ct. 1167, 143 L.Ed. 2d 238 (1999); *see also id.* at 150 ("[T]he factors identified in *Daubert* may or may not be pertinent in assessing reliability, depending on the nature of the issue, the expert's particular expertise, and the subject of his testimony."). Thus, although fingerprint "matching depends on 'subjective judgments by the examiner;" as long as the "evidence [is] created or validated by expert methods and presented by an expert witness that is shown to be reliable," it is admissible under Rule 702. *Herrera*, 704 F.3d at 486 87.

Setting that initial argument aside, Bonds argues that ACE-V is not a reproducible and consistent means of determining whether two prints have a common source and that ACE-V's false positive rate is too high to justify reliance on it in a criminal trial. Bonds focuses on a recent 2016 report issued by the President's Council of Advisors on Science and Technology (the "**PCAST** Report"), which studied latent fingerprint analysis as well as other identification procedures. *See* President's Council of Advisors on Science and Technology, *Forensic Science in Criminal Courts: Ensuring Validity of Feature-Comparison Methods* (Sept. 20, 2016), attached as Ex. 4 to Bonds' Motion. The **PCAST** Report reviewed two black-box studies of latent fingerprint examinations, which were specifically designed to evaluate validity and reliability. An FBI study published in 2011 reported a false positive rate (the rate at which the method erroneously called a match between a known and latent print) of 1 in 306, while a 2014 Miami-Dade Police Department Forensic Services Bureau study had a false positive rate of 1 in 18. Bonds also raises concerns about the subjective nature of fingerprint analysis, citing to various other reports questioning the assumptions on which ACE-V is based and calling for the implementation of additional safeguards in the field.

Bonds' first argument concerning matching of prints has been rejected by the Seventh Circuit, which noted that the "methodology requires recognizing and categorizing scores of distinctive features in the prints, and it is the distinctiveness of these features, rather than the ACE-V method itself, that enables expert fingerprint examiners to match fingerprints with a high degree of confidence." *Herrera*, 704 F.3d at 485. The *Herrera* court acknowledged that latent fingerprint matching is less reliable and rigorous than DNA evidence, but it found fingerprint matching "admissible evidence, in general" despite the fact that "the matching process is judgmental rather than scientifically rigorous." *Id.* at 486 87. Although the **PCAST** Report focuses on scientific validity, the Court agrees with *Herrera*'s broader reading of Rule 702's reliability requirement.

More importantly, the **PCAST** Report found that "latent fingerprint analysis is a foundationally valid subjective methodology albeit with a false positive rate that is substantial and is likely to be higher than expected by many jurors based on longstanding claims about the infallibility of fingerprint analysis." **PCAST** Report at 9. Although the **PCAST** Report suggested that accurate information about limitations on the reliability of the evidence be provided, this information concerning false positive rates, in addition to the other concerns raised in the **PCAST** Report and by Bonds in his motion, goes to

the weight of the fingerprint evidence, not its admissibility. *See Stollings v. Ryobi Techs., Inc.*, 725 F.3d 753, 766 (7th Cir. 2013) ("An expert may provide expert testimony based on a valid and properly applied methodology and still offer a conclusion that is subject to doubt. It is the role of the jury to weigh these sources of doubt."); *Metavante Corp. v. Emigrant Sav. Bank*, 619 F.3d 748, 762 (7th Cir. 2010) (criticisms of the quality of an expert's opinion go to the appropriate weight to be accorded to the evidence and not to its admissibility). Bonds will have adequate opportunity to explore these issues on cross-examination.

II. Reliability of ACE-V as Applied by Glass in this Case

***3** Bonds also argues that the Court should exclude the government's proposed fingerprint testimony because the government cannot demonstrate that Glass reliably applied ACE-V in examining the fingerprints in this case. Again, Bonds relies on the **PCAST** Report, which noted that in finding whether latent fingerprint analysis has been reliably applied, the Court should consider whether (1) "the examiner has undergone regular and rigorous proficiency testing," (2) "the latent print(s) are of the quality and completeness represented in the foundational validity studies," and (3) "measures [have been] taken to mitigate bias during casework." **PCAST** Report at 101. Bonds complains that the government has not provided any information related to these factors.

The government responds that it has met its burden to demonstrate that the proffered fingerprint evidence in this case is reliable, and that Bonds' request that the government comply with **PCAST**'s advisory recommendations goes beyond what is required to meet Rule 702. The Court is satisfied that the government has sufficiently established that Glass reliably applied the ACE-V method to this case, with Bonds able to raise concerns about her application of the ACE-V method to the prints at issue on cross-examination. But, while the Court agrees with the government that the **PCAST** Report presents only advisory recommendations concerning validity as applied, given that the Court does not have before it the entirety of the government's disclosures to Bonds, Bonds and the government should confer prior to trial to determine whether the government has any additional information concerning Glass' fingerprint examinations that should be disclosed to Bonds prior to Glass' testimony. *See United States v. Saunders*, 826 F.3d 363, 369 70 (7th Cir. 2016) (finding that government's failure to disclose the number of points that matched in fingerprint comparison prior to expert's testimony may have hindered "a defendant's ability to prepare an attack on the validity of the identification"); *United States v. Robinson*, 44 F. Supp. 2d 1345, 1346 (N.D. Ga. 1997) (government's failure to properly disclose the location of each point of comparison used by government's fingerprint expert left defendant's expert unable to review the basis of the opinion). To the extent Bonds determines that Glass did not comply with the recommended **PCAST** procedures, Bonds can raise these concerns on cross-examination.

Therefore, the Court denies Bonds' motion to exclude the government's fingerprint testimony at trial, finding instead that the issues Bonds raises go to the weight to be accorded to the fingerprint evidence and not to its admissibility.

III. Limitations on Fingerprint Evidence Testimony

Alternatively, Bonds requests that if the Court does allow Glass to testify, the Court (1) prevent Glass from testifying to a match between the latent print and the suspect print, instead limiting her to describing similarities and differences between the prints; and (2) require Glass to acknowledge that the level of certainty of a purported match is limited by the most conservative reported false positive rate in an appropriately designed empirical study thus far (*i.e.,* the 1 in 18 false positive rate from the 2014 Miami-Dade study). The Court declines to limit Glass' testimony as Bonds requests. Instead, Bonds can raise these issues with Glass on cross-examination and highlight them during his closing argument.

In a similar vein, the government asks the Court to preclude Bonds from raising any questions concerning the *Mayfield* case or any other unrelated case involving flawed fingerprint analysis while cross-examining Glass. The government argues that such cross-examination on collateral matters would distract and confuse the jury. Specifically, the government is concerned that Bonds will seek to cross-examine Glass about the FBI's misidentification of Brandon Mayfield as an individual connected to train bombings in Madrid in 2004. The FBI identified fingerprints found on a bag of detonators in a van used by the bombers as Mayfield's, leading to his arrest, but two weeks later, the Spanish police informed the FBI that it had identified another individual as the source of the fingerprints, causing the FBI to withdraw its identification of Mayfield. Subsequently, the U.S.

Department of Justice's Office of the Inspector General conducted a review of the case, issuing a report that detailed various problems with the use of ACE-V in the case. Bonds references the *Mayfield* case extensively in arguing that the ACE-V method is not reliable. He argues that discussion of the *Mayfield* case is a critical part of any cross-examination to demonstrate to the jury that misidentifications happen and have happened before.

***4** The government, relying on *United States v. Rivas*, in which the Seventh Circuit found it did not violate the defendant's confrontation rights or constitute an abuse of discretion to preclude the defense from inquiring specifically about the *Mayfield* case, argues that the Court should similarly limit questioning because Glass was in no way involved in *Mayfield*. *See* 831 F.3d 931, 935 (7th Cir. 2016). The Court agrees that questioning Glass about a case in which she was not involved would distract from the issues before the jury, has little if any relevance, and would not be appropriate here. *Id.* The Court does not find Bonds' argument persuasive that questioning about the *Mayfield* case would ensure that the jury understands that fingerprint misidentifications happen, where the Court is not precluding Bonds from raising general questions on that issue. As discussed above and as the government acknowledges, the Court's ruling does not prevent Bonds from questioning Glass about the reliability of the ACE-V methodology generally but only is intended to keep the testimony from devolving into a side trial concerning cases in which Glass had no involvement.

CONCLUSION

For the foregoing reasons, the Court denies Bonds' motion to preclude expert testimony regarding fingerprint analysis [153]. The Court grants the government's request to preclude Bonds from discussing the Mayfield case and other unrelated cases involving flawed fingerprint analysis during Glass' cross-examination.

All Citations

Slip Copy, 2017 WL 4511061

End of Document

KBI Next Week

From: "Hunt, Ted (ODAG)" <(b) (6)
To: "Antell, Kira M. (OLP)" <(b) (6)
Date: Tue, 12 Sep 2017 11:19:47 -0400
Attachment KBI Speech DRAFT doc (40 72 kB)

Kira,

First draft of KBI speech for next week is attached. Please take a look when you get a chance.

Thx. Ted

Ted R. Hunt
Senior Advisor on Forensic Science
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KBI Speech-DRAFT_KMA

From: "Antell, Kira M. (OLP)" <(b) (6)
To: "Hunt, Ted (ODAG)" <(b) (6)
Date: Wed, 13 Sep 2017 12:25:29 -0400
Attachment KBI Speech DRAFT KMA doc (43 52 kB)

See what you th
PCAST section (b)(5)

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

Duplicative Material see bates stamp 20220314-09361

DRAFT Remarks

From: "Hunt, Ted (ODAG)" <(b) (6)
To: "Crowell, James (ODAG)" <(b) (6) "Hur, Robert (ODAG)" <(b) (6)
Date: Fri, 15 Sep 2017 11:22:58 -0400
Attachment DRAFT Remark KBI KS AG Meeting Sept 20 doc (46 27 kB)

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
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FRC Talkers-Additions

From: "Hunt, Ted (ODAG)" <(b) (6)
To: "Antell, Kira M. (OLP)" <(b) (6)
Date: Wed, 11 Apr 2018 12:49:48 -0400
Attachment Hunt' Addition FRC Meeting Talker doc (15 96 kB)

Kira,

Attached are relevant excerpts from the Committee Note to FRE 702, with my comments below each.

Ted

Ted R. Hunt
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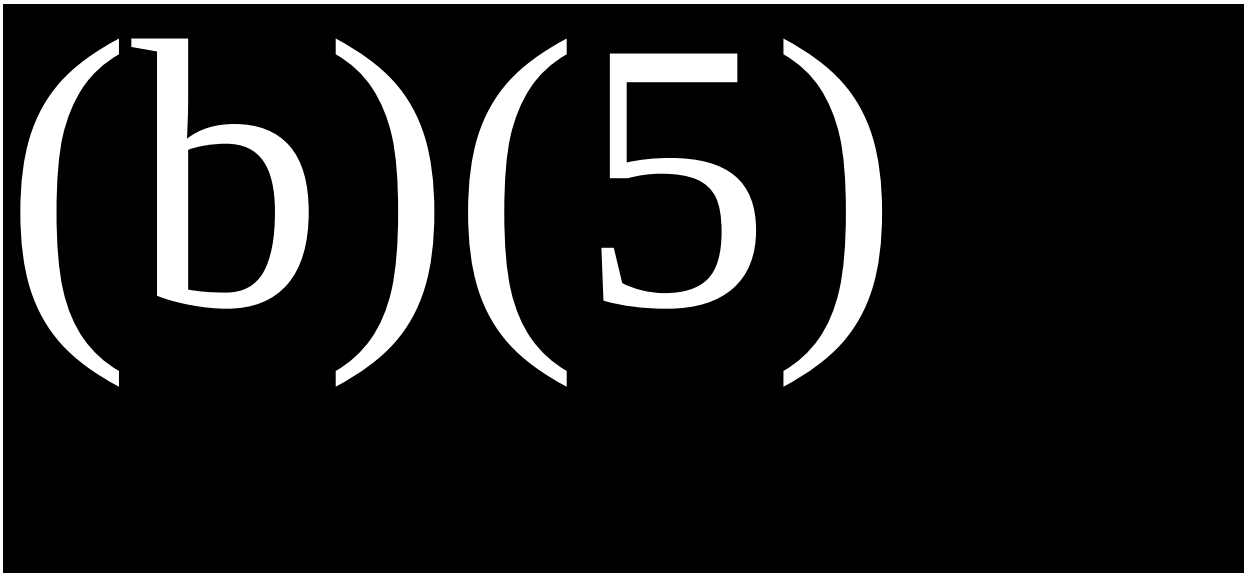
(Excerpts from FRE 702 Advisory Committee Notes and my Comments)

Notes of Advisory Committee on Proposed Rules

"Ruiz-Troche v. Pepsi Cola, 161 F.3d 77, 85 (1st Cir. 1998) ("**Daubert** ***neither requires nor empowers trial courts to determine which of several competing scientific theories has the best provenance***.")."



"GAP Report—Proposed Amendment to Rule 702. The Committee made the following changes to the published draft of the proposed amendment to Evidence Rule 702:

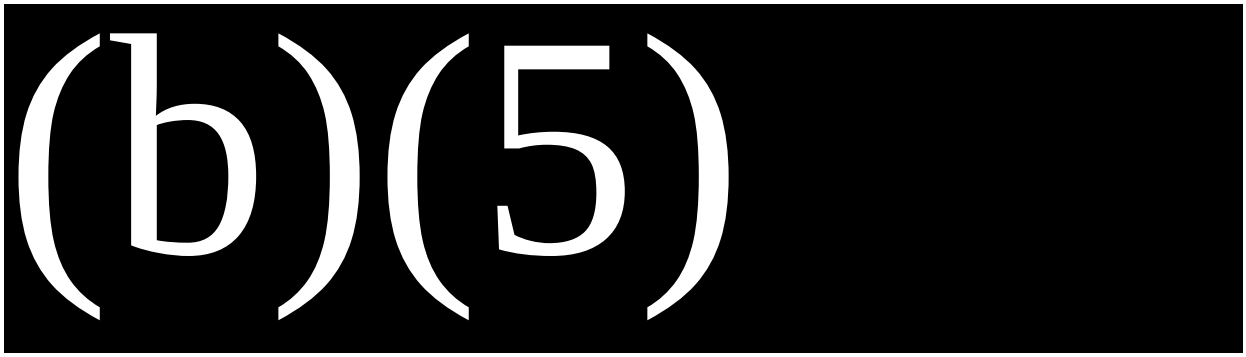
1. The word "reliable" was deleted from Subpart (1) of the proposed amendment, in order to avoid an overlap with Evidence Rule 703, and to clarify that an expert opinion need not be excluded simply because it is based on hypothetical facts. The Committee Note was amended to accord with this textual change.

2. The Committee Note was amended throughout to include pertinent references to the Supreme Court's decision in *Kumho Tire Co. v. Carmichael*, which was rendered after the proposed amendment was released for public comment. Other citations were updated as well.

3. The Committee Note was revised to emphasize that the amendment is not intended to limit the right to jury trial, ***nor to permit a challenge to the testimony of every expert, nor to preclude the testimony of experience-based experts, nor to prohibit testimony based on competing methodologies within a field of expertise.***

4. Language was added to the Committee Note to clarify that no single factor is necessarily dispositive of the reliability inquiry mandated by Evidence Rule 702."

"Nothing in this amendment is intended to suggest that experience alone—or experience in conjunction with other knowledge, skill, training or education—may not provide a sufficient foundation for expert testimony. To the contrary, the text of Rule 702 expressly contemplates that an expert may be qualified based on experience. In certain fields, experience is the predominant, if not sole, basis for a great deal of reliable expert testimony. *See, e.g., United States v. Jones*, 107 F.3d 1147 (6th Cir. 1997) (***no abuse of discretion in admitting the testimony of a handwriting examiner who had years of practical experience and extensive training, and who explained his methodology in detail***); *Tassin v. Sears Roebuck*, 946 F.Supp. 1241, 1248 (M.D.La. 1996) (design engineer's testimony can be admissible when the expert's opinions "are based on facts, a reasonable investigation, and traditional technical/mechanical expertise, and he provides a reasonable link between the information and procedures he uses and the conclusions he reaches"). *See also Kumho Tire Co. v. Carmichael*, 119 S.Ct. 1167, 1178 (1999) (stating that "no one denies that an expert might draw a conclusion from a set of observations based on extensive and specialized experience.")."



FW: Article

From: "Hunt, Ted (ODAG)" <(b) (6)
To: "Antell, Kira M. (OLP)" <(b) (6)
Date: Mon, 27 Nov 2017 15:05:39 -0500
Attachment It i Now Up to the Court Foren ic Science in Criminal Court pdf (213 97 kB)

FYI thi wa written by Jennifer Friedman, LA County Public Defender' Office and member of the OSAC LRC

From: Stoiloff, Stephanie L. [mailto (b) (6)]
Sent: Monday, November 27, 2017
To: Hunt, Ted (ODAG) <(b) (6) >
Subject: Article

FYI

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Santa Clara Law Review

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It is Now Up to the Courts: "Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods"

Jennifer Friedman

Jessica Brand

IT IS NOW UP TO THE COURTS: "FORENSIC SCIENCE IN CRIMINAL COURTS: ENSURING SCIENTIFIC VALIDITY OF FEATURE-COMPARISON METHODS"

Jennifer Friedman* and Jessica Brand**

* Jennifer Friedman is a Los Angeles County Public Defender and the Forensic Science Coordinator for the office. The views expressed in this article are her own. Jessica Brand is the Legal Director at the Fair Punishment Project. The views expressed in this article are her own.

** The authors wish to thank Gabriel Fuentes for reviewing the article and offering some very helpful suggestions.

INTRODUCTION

In this article we explore the history of what we characterize as failed attempts to reform forensic science. We describe in detail the newly issued report by the President's Advisors on Science and Technology and its attempt to evaluate the scientific validity of some of the most commonly used "feature-comparison" disciplines.[1] In that report, the committee addresses the intersection of legal admissibility and scientific validity, and it concludes that many forensic sciences do not meet the criteria for either. We then argue that forensic reform will not occur until the courts truly become gatekeepers against the admission of junk science, as the law requires. We provide a roadmap for courts to follow to properly review the admissibility of forensic science.

In its 2009 report "Strengthening Forensic Science in the United States: A Path Forward," the National Academy of Sciences (NAS) issued a scathing critique of forensic science research. "With the exception of nuclear DNA analysis," the committee of esteemed scientists wrote, "no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source."[2] Throughout the 350-page report, the committee reiterated that traditional forensic sciences lacked empirical data supporting the claims of individualization regularly made in the courtroom.[3] The committee urged the forensic community to "develop rigorous protocols to guide these subjective interpretations and pursue equally rigorous research and evaluation programs."[4]

Yet in the last seven years, the forensic science community has made little progress validating many types of forensic analysis, and it has not scaled back the forceful conclusions of individualization—that a known sample is the source of an evidentiary sample recovered from a crime scene—regularly made by analysts in feature-comparison fields. While the federal government has started conducting scientific research into some types of forensic analysis including fingerprint comparison, that research is extremely limited.[5] Importantly, forensic examiners

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1. In the feature comparison disciplines, an examiner evaluates features or characteristics of an evidence sample, compares those features to a known and then makes a judgment about whether the evidence sample matches the known or does not match the known.

2. COMM. ON IDENTIFYING THE NEEDS OF THE FORENSIC SCIENCES CMTY., NAT'L RESEARCH COUNCIL, 228091, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD 1, 7 (2009) [hereinafter NATIONAL ACADEMY OF SCIENCES REPORT].

3. *Id.*at 7.

4. *Id.* at 8.

5. See National Institute of Justice Research and Development Projects https://www.nij.gov/topics/forensics/Pages/research-development-projects.aspx

seem unwilling to limit the scope of their testimony. They have continued as before—and innocent people have gone to jail as a result.[6]

The recent report by the President's Council of Advisors on Science and Technology (PCAST) recognized that forensic scientists have not heeded the warnings in the NAS report.[7] This watershed report highlighted the lack of meaningful research establishing the scientific validity of feature-comparison forensics.[8] For the second time in a decade, the report concluded that with few exceptions, feature-comparison scientists have not performed research establishing that examiners can do what they say they can do: reliably identify a known sample as the source of recovered trace evidence.[9] The authors of PCAST detailed steps for forensic examiners to take to establish scientific validity, but noted that "PCAST expects that some forensic feature-comparison methods may be rejected by courts as inadmissible because they lack adequate evidence of scientific validity."[10]

Given forensic scientists' reticence to establish the accuracy and reliability of their comparison methods, courts must do just this—reject certain feature-comparison evidence—and serve as a barrier to the admission of evidence lacking an empirical foundation. Judges must understand the prerequisites for a validated scientific method, the relationship between established legal principles and scientific validity, and how to apply those principles in criminal cases. A court's failure to understand the role of validity and reliability when evaluating the admissibility of feature-comparison evidence, and relatedly, its refusal to exclude feature-comparison evidence where the proponent does not establish its reliability or validity, calls into question the fairness and integrity of the criminal proceedings[11]

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6. According to the Innocence Project, faulty forensic science accounts for 46% of cases exonerated through DNA evidence. *Misapplication of Forensic Science*, THE INNOCENCE PROJECT, https://www.innocenceproject.org/causes/misapplication-forensic-science/.

7. *See* President's Council of Advisors on Sci. & Tech., Exec. Office of the President, REPORT TO THE PRESIDENT, Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods 1, 1-2 (Sept. 2016) [hereinafter PCAST Report].

8. *See id.* at 4.

9. *Id.*

10. *Id.*at 122.

11. *Womack v. United States,* 350 A.2d 381, 383 (D.C.1976) ("A criminal trial is not a game, but a quest for truth."); State v. Behn, 375 N.J.Super. 409, 434 (App. Div. 2005) ("the integrity of the criminal justice system is ill-served by allowing a conviction based on evidence of this quality, whether described as false, unproven or unreliable, to stand").

I. THE NATIONAL ACADEMY OF SCIENCES REPORT

In February of 2009, the National Academy of Sciences,[12] at the direction of Congress, issued a report entitled "Strengthening Forensic Science in the United States: A Path Forward." The NAS issued the report after Congress, in 2005, ordered it to "asses the present and future resource needs of the forensic science community," recognizing that "there exists little to no analysis of the remaining needs of the community outside of the area of DNA."[13] Congress mandated that the NAS chart an agenda for the forensic science community to "ensure the reliability of the disciplines, establish enforceable standards, and promote best practices and their consistent application."[14]

The members of the NAS committee included research scientists, academics, forensic scientists, pathologist, judges, a defense attorney and a former prosecutor.[15] This committee heard testimony from members of the forensic science community and reviewed and evaluated numerous studies and articles submitted by forensic science stakeholders.[16]

After over two years of research, the NAS issued a scathing report demonstrating serious deficiencies in forensic science and in the manner in which prosecutors utilize forensic evidence in the criminal justice system. The committee found that the forensic disciplines largely lacked standardization, certification, and accreditation.[17] Perhaps most importantly, the committee reached the following conclusion: "Among existing forensic methods, only nuclear DNA analysis has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between an evidentiary sample and a specific individual source."[18] Forensic scientists had conducted virtually no research establishing the validity and reliability

12. The National Academy of Sciences, an arm of the National Research Council, is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare.

13. NATIONAL ACADEMY OF SCIENCES REPORT, *supra* note 2, at 1.

14. *Id.* at xix.

15. *Id*. at v. "The Committee was composed of a diverse and accomplished group of professionals. Seven of the 17 Committee members are prominent professionals in the forensic science community, with extensive experience in forensic analysis and practice; 11 members of the Committee are trained scientists (with expertise in physics, chemistry, biology, engineering, biostatistics, statistics, and medicine); 10 members of the Committee have Ph.Ds, 2 have MDs, 5 have JDs, and one has an M.S. in chemistry." Harry T. Edwards, *The National Academy of Sciences Report in Forensic Sciences What it Means for the Bench and Bar*, 51 JURIMETRICS J. 1 (2010).

16. NATIONAL ACADEMY OF SCIENCES REPORT, *supra* note 2, at xix–xx.

17. *Id.* at 6.

18. *Id*. at 100.

of most forensic science disciplines, including toolmarks, handwriting, fingerprint, hair, bitemark, and footprint analysis.[19] Forensic examiners commonly reported and testified to individualization statements without empirical data supporting such statements.[20]

The authors emphasized that for the feature-comparison fields to be generally accepted and considered valid and reliable, forensic scientists needed to conduct significant research evaluating the limitations of each discipline.[21] It recommended that forensic scientists carefully measure the examiners' actual performance.[22] The committee urged the analysts to carefully study the effects of cognitive bias[23] and human error.[24] It also made structural recommendations, including the creation of an independent federal entity, the National Institute of Forensic Sciences.[25]

Because the authors wrote the report to provide suggestions to forensic practitioners about improving research to make forensic science reliable, it did not specifically address issues of legal admissibility. But the authors anticipated that the courts would utilize the report's findings when assessing the admissibility of that evidence.[26] The co-chair of the committee, Honorable Harry T. Edwards, stated in a presentation to judges the year after the report's publication: "[I]t seemed quite obvious . . . that if a particular forensic methodology or practice, once thought to be scientifically valid, has been revealed to lack validation or reliability, no prosecutor would offer evidence derived from that discipline without taking the new information into account and no judge would continue to admit such evidence without considering the new information regarding the scientific validity and reliability of its source."[27]

II. THE INTERVENING YEARS

In the wake of NAS, courts largely ignored the report's findings and continued to allow forensic scientists, particularly in the pattern-impression disciplines,[28] to testify to individualization statements

19. NATIONAL ACADEMY OF SCIENCES REPORT, *supra* note 2, at 7-8.

20. *Id*. at 7. "With the exception of nuclear DNA analysis, however, no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source."

21. *Id.* at 8.

22. *Id.* at 24.

23. A cognitive bias is a mistake in reasoning, evaluating, remembering, or other cognitive process, often occurring as a result of holding onto one's preferences and beliefs regardless of contrary information. *Id.* at 122.

24. *Id.*

25. NATIONAL ACADEMY OF SCIENCES REPORT, *supra* note 2, at 19.

26. *See id.* at 5–6.

27. Edwards, *supra* note 10, at 5.

28. PCAST refers to these disciplines as "feature comparison methods." PCAST REPORT, *supra* note 5, at 1.

without a scientific basis for the statements.[29] In the meantime, there has been little progress by forensic examiners in developing research. The National Commission on Forensic Science (NCFS), a partnership between the Department of Justice (DOJ) and the National Institute of Standards and Technology (NIST), and the Organization of Scientific Area Committees (OSAC), an infrastructure of forensic scientists under NIST, have taken steps toward improving forensic research, but significantly more is needed. While the NCSF has promulgated a number of "Views Documents" and "Recommendations" to improve the reliability of forensic science evidence, there is currently no mechanism for requiring state and local labs or prosecuting agencies to adopt these recommendations.[30] And while OSAC has tried to improve forensic science by adopting consensus based documentary standards, as is its mission,[31] the process of formulating them is understandably slow. Indeed one of the first standards adopted by the OSAC received significant criticism because it did not utilize scientifically rigorous language.[32]

Yet judges have largely have continued with business as usual, admitting forensic evidence largely as they did prior to the NAS Report. There are several possible explanations for judges' hesitation to restrict the use of feature-comparison testimony in court, notwithstanding the NAS critiques. One is criminal defense attorneys' failure to understand and adequately raise the issues in pre-trial pleadings. As Judge Nancy Gertner stated: "[T]he NAS Report's concerns will not be fully met until advocacy changes."[33] "[I]n the face of precedent favoring the admission of [feature-comparison identifications], the defendant [will have] to do

29. *See, e.g.*, United States v. Johnson, No. 14-cr-00412-THE, 2015 U.S. Dist. LEXIS 111921 (N.D. Cal. Aug. 24, 2015) **"**((T)he only 'revelation' identified by Defendant is a 2009 report from the National Research Council that has been considered and rejected as a basis for excluding ballistics evidence by numerous courts."

30. https://www.justice.gov/ncfs/work-products-adopted-commission

31. "The aim of the Organization of Scientific Areas Committees for Forensic Science (OSAC) is to promote technically sound, consensus based, fit-for-purpose documentary standards that are based on sound scientific principles. https://www.nist.gov/forensics/organization-scientific-area-committees-forensic-science "NIST has established OSAC to support the development and promulgation of forensic science consensus documentary standards and guidelines, and to ensure that a sufficient scientific basis exists for each discipline." Forensic Science: *Organization of Scientific Area Committees (OSAC) for Forensic Science*, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, https://www.nist.gov/topics/forensic-science/organization-scientific-area-committees-osac.

32. News: NIST Statement on ASTM Standard E2329-14, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (Mar. 17, 2016), https://www.nist.gov/news-events/news/2016/03/nist-statement-astm-standard-e2329-14.

33. Judge Nancy Gertner, *Commentary on the Need for A Research Culture in the Forensic Sciences*, 58 UCLA L. REV. 789, 790 (2011).

some work—produce some data or expert testimony, real evidence suggesting the limitations of [pattern-matching]."[34] This is no easy task, as defense attorneys often lack resources to help them navigate the complexities of litigating the admissibility of forensic science.[35] It may also be that too few independent experts understand the problems in the feature-comparison field are willing to testify in *Daubert* and *Frye* hearings on behalf of the defense.[36] It may be that both prosecutors and the judiciary do not understand how deeply flawed the feature-comparison field's existing research is, or do not know what it means to adhere to the scientific method. Or it may be that prosecutors do not want to understand, because it will weaken their cases.

Whatever the cause, the reluctance to exclude evidence lacking a scientific foundation is disturbing. The significance of expert testimony at trial cannot be overstated. Scientific expert testimony carries with it the "aura of special reliability and trustworthiness," creating a grave risk that jurors will receive it without a critical eye.[37] Perhaps because juries view forensic testimony with unfailing trust, the use of unreliable forensic science is one of the leading causes of wrongful convictions.[38]

Many believe that without pressure from the courts, forensic scientists will never produce research proving that their fields are scientifically valid.[39] There is historical precedent for courts acting as a catalyst for scientific research. When prosecutors first introduced DNA evidence in the courts, DNA analysts had not yet validated the methods used in interpretation. In *People v. Castro*,[40] the New York Supreme Court ruled that one of the lab's methods for interpreting the DNA results was not generally accepted as reliable by the scientific community.[41] The Court's ruling set in motion a wave of research and the forensic science community developed new reliable methods for reporting DNA results.[42]

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34. *Id*. at 791.

35. Peter J. Neufeld, The (Near) Irrelevance of Daubert to Criminal Justice: And Some Suggestions for Reform, 95 S1 AM. J. PUB. HEALTH S107, S110 (2005).

36. Daubert and Frye are the standards governing admissibility of scientific evidence in courts across the country. See Daubert v. Merrell Dow Pharms., Inc., 509 U.S. 579 (1993); Frye v. United States, 293 F. 1013 (D.C. Cir. 1923). The party seeking to admit scientific evidence has the burden of proving the scientific technique or method is reliable under the Daubert standard and generally accepted as reliable by the scientific community under Frye.

37. United States v. Downing, 753 F.2d 1224, 1236 (3d Cir. 1985); *see also* United States v. Haines, 803 F.3d 713, 730 (5th Cir. 2015) (recognizing the significance of expert testimony to juries); People v. Kelly, 17 Cal. 3d 24, 31 (1976) ("Lay jurors tend to give considerable weight to 'scientific' evidence when presented by 'experts' with impressive credentials.").

38. *See* Brandon L. Garrett, *Judging Innocence*, 108 COLUM. L. REV. 55, 81–84 (2008).

39. PCAST REPORT, *supra* note 5, at 122-123.

40. People v. Castro, 545 N.Y.S.2d 985 (Sup. Ct. 1989).

41. *Id.* at 996-998.

42. Mnookin, J. *People v. Castro Challenging the Forensic Use of DNA Evidence*,

III. THE PCAST REPORT

The next major report to evaluate the state of forensic research recommended that courts do just that—serve as a gatekeeper against the admission of questionable forensic science. In 2015, the President of the United States requested the President's Council of Advisors on Science and Technology (PCAST) to determine "whether there were additional steps on the scientific side, beyond those already taken by the Administration in the aftermath of the highly critical 2009 National Research Council report."[43] The committee deliberately addressed their report not only to forensic scientists, but also to members of the criminal justice system.[44] The committee devoted one chapter of the report to "The Role of Scientific Validity in the Courts," and the committee made specific recommendations to both the Attorney General and to the Judiciary.[45]

The PCAST committee included renowned research scientists who reviewed and evaluated over 2000 publications submitted by members of the forensic science community.[46] In addition, the committee consulted with a panel of Senior Advisors including nine current or former federal judges, a former U.S. Solicitor General, a former state Supreme Court justice, two law-school deans, and two distinguished statisticians with expertise in forensic science.[47]

The resulting report focused exclusively on "feature-comparison methods," methods that attempt to determine "whether an evidentiary sample from a crime scene is or is not associated with a potential source sample from a suspect, based on the presence of similar patterns, impressions, or other features in the sample and the source." The report examined DNA, latent fingerprints, firearms and toolmarks, bitemarks, hair comparison, and footwear.[48] All of these disciplines belong to the field of metrology, "the science of measurement and its application."[49] The report gave considerable attention to latent fingerprints, toolmarks and firearms, and DNA, disciplines relied on most frequently in current criminal prosecutions.

Recognizing the courts' gatekeeping role in prohibiting the admission of unreliable scientific evidence, the PCAST committee emphasized the intersection of scientific validity and legal

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Journal of Scholarly Perspectives, 3(01)(2007).

43. PCAST REPORT, *supra* note 5 at x.
44. *Id*. at 1–2.
45. *Id*. at xii–xiii.
46. *Id.* at 2.
47. *Id.*
48. *Id.* at 1.
49. PCAST REPORT, *supra* note 5, at 23.

admissibility.[50] The report focused exclusively on the *Daubert*[51] standard for admissibility, but its analysis applies equally to *Frye*[52] jurisdictions.[53] The authors stated explicitly that for a discipline or method to be considered scientifically valid, the proponent of the evidence must show that it is foundationally valid; that the existing method can, in principle, be validly applied to achieve accurate results; and that it is valid "as applied": that the specific analyst in this case accurately applied the method in practice.[54]

A. Foundational Validity

To be "foundationally valid," a field must utilize a method that has been subject to "empirical testing by multiple groups, under conditions appropriate to its intended use."[55] Those studies must show that the method is "repeatable and reproducible."[56] A method is "repeatable" if, with a known probability, an examiner can reach the same result while analyzing samples from the same sources. A method is "reproducible" if, with known probability, different examiners can obtain the identical outcome while evaluating the same samples.[57] A method, in other words, is foundationally valid if studies show it has a "reproducible and consistent procedure for (a) identifying features within evidence samples; (b) comparing the features in two samples; and (c) determining, based on the similarity between the features in two samples, whether the samples should be declared to be a proposed identification ("matching rule").[58] The studies must also provide "valid estimates of the method's accuracy," demonstrating how often an examiner is likely to draw the wrong conclusions."[59] As the PCAST committee noted, "foundational validity" is the scientific analogue to Federal Rule of Evidence 702's requirement that expert testimony must be the product of "reliable principles and methods.[60]

The PCAST authors described two possible ways for examiners to establish foundational validity. For objective techniques, such as single source DNA analysis and interpretation, scientists establish foundational validity through research establishing the accuracy,

50. *Id*. at 4.
51. Daubert v. Merrell Dow Pharms., 509 U.S. 579, 597 (1993).
52. Frye v. United States, 293 F. 1013 (D.C. Ct. App. 1923).
53. *See* PCAST Report, *supra* note 5, at 40-43.
54. *Id.* at 4–5.
55. *Id*. at 5.
56. *Id.*
57. *Id.* at 47.
58. *Id*. at 48.
59. PCAST REPORT, *supra* note 5, at 5.
60. *Id.* at 4–5.

reproducibility, and consistency of each of its individual steps.[61] In DNA, for example, experts have developed population frequencies showing the uniqueness of particular genetic codes. But for techniques that are subjective and rely heavily on human judgment—for example, analysis of complex DNA mixtures, fingerprints and toolmarks—the simplest way to demonstrate validity is through black box error rate studies, which look at how often an examiner gets the right answer when properly applying a method or technique.[62] Through these black box studies, examiners must show that they can do what they say they can do in circumstances and conditions replicating actual case work[63].

The committee voiced two major concerns about the forensic community's previous attempts to skirt proving foundational validity. First, the committee addressed examiners' frequent claim that training and experience could substitute for empirical studies. The report was firm: "[N]either 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."[64] The report continued:

> 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. 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.[65]

Second, the committee addressed examiners' tendencies to make claims unsupported by empirical studies. Studies that validate the field will generally also show that the field has limitations. Statements in reports or in testimony must accurately convey those limits and the method's error rates. "Statements claiming or implying greater certainty than demonstrated by empirical evidence are scientifically invalid."[66] The committee expressed concern that examiners regularly state that they are "100 percent certain" or have a "zero error rate," statements that are not scientifically defensible:

> From the standpoint of scientific validity, experts should never be

61. *Id.* at 5.
62. *Id*. at 5–6.
63. *Id*. at 48.
64. *Id.* at 6.
65. PCAST REPORT, *supra* note 5, at 6.
66. *Id.* at 6.

> permitted to state or imply in court that they can draw conclusions with certainty or near-certainty (such as "zero," "vanishingly small," "essentially zero," "negligible," "minimal," or "microscopic" error rates; "100 percent certainty" or "to a reasonable degree of scientific certainty;" or identification "to the exclusion of all other sources."[67]

B. Validity as Applied

To establish "validity as applied," the field must show that the examiner has reliably applied the method on case-like samples in the past, that she correctly applied the method in the particular case, and that she carefully reported the error rate established through empirical testing.[68] Critically, the proponent of the evidence must also show that the samples analyzed in the case are similar to those analyzed in validation studies.[69] If an examiner analyzes an eleven-person mixture, for example, and uses a method tested or validated on a three-person mixture, the proponent of the evidence has not shown "validity as applied." Finally, the proponent of the evidence must disclose any information that may impact or influence the analyst's conclusions because cognitive bias is of particular concern when a technique involves subjective judgment.[70] "Validity as applied" is the analogue to Federal Rule of Evidence 702's requirement that "the expert has reliably applied the principles and methods to the facts of the case."[71]

The committee then assessed whether the thousands of studies submitted by forensic scientists in the "feature-matching" disciplines established foundational validity and, if so, whether limits existed to the conclusions an examiner could draw about whether two samples matched.[72] Out of the seven feature comparison disciplines examined, only three fields met the criterion for foundational validity: single source DNA, simple mixed DNA, and latent fingerprints. [73]

C. Specific PCAST Recommendations

Echoing the 2009 NAS Report, the PCAST committee found that bitemark evidence lacked foundational validity.[74] The field had conducted few empirical studies to prove validity, and disturbingly, those studies found such a high false positive rate that the committee

67. *Id*. at 54.
68. *Id.* at 6.
69. *Id.*
70. *Id*. at 10.
71. Fed. R. Evid. 702(d).
72. PCAST REPORT, *supra* note 5, at 67.
73. *Id*. at 67-122.
74. *Id.* at 83-87.

concluded that the field should not waste resources to undertake further studies.[75] PCAST delivered a simple and unequivocal message to courts: bitemark comparison evidence is scientifically invalid.[76] It has not been shown to produce reliable results and should therefore be inadmissible in criminal prosecutions.[77]

The hair comparison studies did not fare much better. Of those submitted, PCAST found serious flaws in almost all of their designs. Only one had relevance to the work forensic hair examiners perform for trial, asking how often forensic hair examiners erroneously associate hairs belonging to different people.[78] The results of that study were disturbing: the study found an 11% false identification rate.[79] Even more troubling, a study conducted by the Department of Justice, in consultation with the National Association of Criminal Defense Attorneys and the Innocence Project, found that hair comparison examiners provided scientifically invalid testimony in 95% of the cases reviewed.[80]

PCAST similarly found forensic examiners failed to establish foundational validity for shoeprint comparison: "PCAST finds there are no appropriate empirical studies to support the foundational validity of footwear analysis to associate shoeprints with particular shoes based on specific identifying marks (sometimes called 'randomly acquired characteristics'").[81] Such conclusions are unsupported by any meaningful evidence or estimates of their accuracy and thus are not scientifically valid."[82]

The biggest bombshell in the PCAST report, and the one that produced substantial backlash amongst forensic examiners, involved toolmark comparison. Like many of the other forensic disciplines developed by law enforcement rather than scientists, PCAST found that the existing "validation" studies were not properly designed to substantiate the discipline.[83] Of the numerous studies submitted for review, only one—the "Ames" study—was properly designed.[84] In that study, the researchers asked examiners to perform analyses that generally mirrored actual case work.[85] The results were striking.

75. *Id.* at 87.
76. *Id.* at 83-87.
77. *Id.* at 87.
78. PCAST REPORT, *supra* note 5, at 118.
79. *Id.* at 121.
80. *Id*. at 30.
81. *Id.* at 117.
82. *Id.*
83. *Id.* at 11.
84. PCAST REPORT, *supra* note 5, at 110-11.
85. *Id.*

According to this study, the error rate for firearms comparison was between 1 out of 46 and 1 out of 66, a far cry from the "100 percent certainty" frequently testified to by firearms examiners.[86]

The committee concluded:

> PCAST finds that firearms analysis currently falls short of the criteria for foundational validity, because there is only a single appropriately designed study to measure validity and estimate reliability. The scientific criteria for foundational validity requires more than one such study to demonstrate reproducibility. [87]

The committee acknowledged that "[w]hether firearms analysis should be deemed admissible based on current evidence is a decision that belongs to the courts."[88] But it urged courts that did admit this evidence to use caution: "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 or with a 95 percent confidence limit of 1 in 46, in the one such study to date)."[89]

Unlike other feature-comparison fields, PCAST noted that fingerprint examiners responded to the 2009 NAS criticisms and developed well-designed validation studies. Two recent studies—the Tangen study and the Miami Dade study—provided empirical evidence of foundational validity.[90] But PCAST emphasized that both studies produced significant error rates, debunking analysts' frequent claims to have zero error rates.[91]

PCAST made the following recommendations about what should and should not be acceptable testimony by fingerprint analysts:

> Conclusions of a proposed identification may be scientifically valid, provided that they are accompanied by accurate information about limitations on the reliability of the conclusion—specifically, that (1) only two properly designed studies of the foundational validity and accuracy of latent fingerprint analysis have been conducted, (2) these studies found false positive rates that could be as high as 1 error in 306 cases in one study and 1 error in 18 cases in the other, and (3) because the examiners in the studies were aware they were being tested, the actual false positive rate in casework may be higher.[92]

PCAST also recognized that claims of higher accuracy are currently

86. *Id.* at 111.
87. *Id.* at 111-12.
88. *Id.*
89. *Id*. at 112.
90. PCAST REPORT, *supra* note 5, at 93-95.
91. *Id.*
92. *Id*. at 101.

"not warranted or scientifically justified . . . [a]dditional black-box studies are needed to clarify the reliability of the method."[93]

Finally, PCAST determined that not all types of DNA analysis are scientifically sound. Since 2009, the types of DNA analysts examine for criminal trials has expanded exponentially. At present, for example, DNA analysts examine miniscule samples, along with extremely complex mixed DNA samples. PCAST evaluated the methodology used to interpret single source DNA, "simple" mixed DNA samples, and complex DNA mixtures[94]. The committee also examined Probabilistic Genotyping, software that interprets low level DNA samples and complex mixtures.[95]

Unlike the other disciplines reviewed, the analysis and interpretation of single source sample and simple mixtures (defined as mixtures that are easily be separated into a major and minor contributor) is objective. The field has developed population frequencies showing the rarity of a genetic profile. The committee found that numerous studies validate the methods used to analyze and interpret single source and simple mixed DNA samples.[96] For those two types of DNA analysis then, the field has established foundational validity.[97] The committee did note that analysts must protect against human error, and should disclose any issues affecting the quality or reliability of their analysis, as well as any information of which the analyst was aware that might influence his conclusion.[98]

In contrast, the interpretation of low level or mixed DNA samples is subjective, much like many of the other disciplines evaluated. Like those other feature-comparison disciplines, subjective DNA analysis suffers from troubling infirmities.

> DNA analysis of complex mixtures is inherently difficult. Such samples result in a DNA profile that superimposes multiple individual DNA profiles. Interpreting a mixed profile is different from and more challenging than interpreting a simple profile, for many reasons. It is often impossible to tell with certainty which genetic variants are present in the mixture or how many separate individuals contributed to the mixture, let alone accurately to infer the DNA profile of each one.[99]

The statistical calculation used to convey the significance of a DNA

93. *Id.* at 101–102.
94. *Id*. at 78-79.
95. *Id.* at 82.
96. PCAST REPORT, *supra* note 5, at 71.
97. *Id.* at 75.
98. *Id*.
99. *Id.* at 8.

match with mixed DNA samples, known as the Combined Probability of Inclusion (CPI) statistic, is a subjective method that relies heavily on examiners' individual judgments about what is and is not real DNA.[100] The field has not yet established its foundational validity.[101] And while researchers may eventually demonstrate the foundational validity of Probabilistic Genotyping Software (PGS), no current independent empirical studies existed establishing the range in which PGS produces reliable results: "At present published evidence supports the foundational validity of analysis, with some programs, of DNA mixtures of 3 individuals in which the minor contributor constitutes at least 20 percent of the intact DNA in the mixture and in which the DNA amount exceeds the minimum required level for the method."[102] The PCAST committee also found that most of these feature-comparison fields also failed the test for validity as applied.

D. PCAST's Addendum[103]

If there are any doubts about the validity of PCAST's conclusions, the events following the issuance of the report should put them to rest. When PCAST published its findings, prosecutors asserted that the conclusions were invalid, alleging that the committee ignored significant research:[104]

> The PCAST position is that the forensic science disciplines specializing in the examination of bitemarks, firearms/toolmarks, complex DNA mixtures, tire-treads, and shoe prints each lack scientific foundational support and should not be permitted for use in the criminal courtroom. However, the opinions expressed by PCAST in their report clearly and obviously disregard large bodies of scientific evidence to the contrary and rely, at times, on unreliable and discredited research.[105]

In response, PCAST sent out a broad request asking stakeholders to submit any additional studies PCAST failed to consider that provided

100. *Id.* at 76.

101. *Id.* at 82.

102. PCAST REPORT, *supra* note 5, at 82.

103. On January 6, 2017 PCAST approved an addendum to its report in which it addressed issues raised by a number of commentators. *See* PRESIDENT'S COUNCIL OF ADVISORS ON SCI. & TECH., EXEC. OFFICE OF THE PRESIDENT, AN ADDENDUM TO THE PCAST REPORT IN FORENSIC SCIENCE IN CRIMINAL COURTS (Jan. 2017), https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensics_addendum_finalv2.pdf [hereinafter ADDENDUM TO PCAST REPORT].

104. NAT'L DIST. ATTORNEYS ASSOC., *National District Attorneys Association Slams President's Council on Science and Technology Report*, (Sept. 2, 2016), http://www.ndaa.org/pdf/NDAA%20Press%20Release%20on%20PCAST%20Report.pdf.

105. *Id.*

empirical support for the scientific validity of the feature matching disciplines considered in the report. No one sent PCAST such studies. The Department of Justice affirmatively stated it had no such studies to submit.[106]

The conclusions reached by PCAST are significant and important. PCAST represents an important voice within the relevant scientific community, and courts must take its conclusions seriously. Of the feature-matching methods evaluated, only latent fingerprint comparison, single source DNA, and simple mixed DNA analysis are foundationally valid. Those other fields, therefore, do not meet the evidentiary requirements of Federal Rule of Evidence 702.

IV. SPECIFIC STEPS FOR COURTS TO FOLLOW

To properly exercise their gatekeeping function, courts should follow PCAST's recommendations and carefully scrutinize any forensic evidence proffered in a criminal trial. There are several steps courts should take to properly do this job.

First, to ensure that the parties properly litigate the admissibility of forensic evidence, all parties must have access to experts with the background and training necessary to assess foundational validity and validity as applied. Courts also should not hesitate to consult statisticians and metrologists in evaluating the empirical foundation for the testimony and deciding whether to allow its admission.

As explained above, PCAST suggests that most feature-comparison sciences are not foundationally valid and should be excluded. Courts should follow that implied recommendation. If the government contends otherwise, courts must require analyzing laboratories to disclose all studies that purportedly show foundational validity and must then carefully assess whether those show empirically that a method is scientifically valid. Once those studies are provided, courts must ask the same questions as the PCAST members did: Do the studies mirror actual casework? Are there established error rates? What is the sample size?

So that courts may examine whether a science meets validity as "applied," they must require total transparency from laboratories and issue robust and detailed discovery orders, even if not requested by defense lawyers. Laboratories must provide all quality control documents, including logs of unexpected results, corrective action files, reports to accrediting and oversight bodies, audits, and any other information documenting errors or problems in the lab that could potentially affect the quality in the lab. Analysts must be open about any potential biasing information and examiners should report the

106. ADDENDUM TO PCAST REPORT, *supra* note 103, 2–3.

information to law enforcement, prosecutors, and others with case-specific information provided prior to the analysis that may have influenced their results. Labs must provide proficiency test results and, upon request, proficiency test files. They should disclose whether the samples in the case are similar to, or differ from, the samples used in the validation studies. Examiners should inform the parties how many times the examiner has conducted the type of analysis on the type of sample in the case at hand. In a DNA case, for example, if the sample is 250 picograms with four or more contributors, the analyst should disclose how many times she has analyzed a comparable sample.

In the end, we believe that courts should refuse to admit most feature-comparison sciences because, to date, the proponent cannot show those fields are reliable and valid. As Professor Jennifer Mnookin has stated, in many cases "outright exclusion may, in some cases, indeed be warranted, and should certainly, along with more modest measures, be part of the available judicial toolkit."[107] If prosecutors continue to rely on "years of precedent" or an examiner's "training and experience," judges can be confident that the fields have made no progress since the PCAST report. In such a case, exclusion is the only legally acceptable option.

If forensic evidence is admitted, courts must place restrictions on the expert's testimony to the scope of the forensic discipline's validity and reliability, preventing experts from overstating the weight of the results or implying a higher degree of certainty and a lower error rate than what studies have established empirically. "[C]ourts should never permit scientifically indefensible claims such as: "'zero', 'vanishingly small', 'essentially zero', 'negligible', 'minimal', or 'microscopic' error rates; '100 percent certainty' or proof 'to a reasonable degree of scientific certainty'; identification 'to the exclusion of all other sources'; or a chance of error so remote as to be a 'practical impossibility'"[108] nor should courts permit experts to testify to a "reasonable degree of scientific (or other type of) certainty" a phrase which has no generally accepted meaning.[109] Courts must ensure that examiners clearly and accurately state their results, that they present the error rate for the results as set forth in the PCAST report, and that they disclose any additional limitations to their opinions. And examiners should disclose any potential biasing or contaminating information provided prior to their analysis of the evidence.

Finally, courts must instruct juries regarding the limitations of the

107. Jennifer L. Mnookin, *The Courts, the NAS, and the Future of Forensic Science*, 75 BROOK. L. REV. 1209, 1214 (2010).

108. PCAST REPORT, *supra* note 5, at 19, 145.

109. *Id.* at 30.

expert opinion. And they must keep close watch on the government and the defense, making sure that neither party misstates or overstates the expert's opinion in argument.

If courts fulfill their responsibility to ensure that only scientifically accepted evidence is presented to juries, they will not only improve the results of criminal trials, but they will also likely catalyze the scientific community to conduct the studies necessary to demonstrate scientific validity—if it can be established.

Hunt-Special Topics

From: "Hunt, Ted (ODAG)" <(b) (6)
To: "Antell, Kira M. (OLP)" <(b) (6)
Date: Mon, 21 May 2018 12:37:03 -0400
Attachment DOJ Special Topic FINAL ppt (2 38 MB)

Here you go.

Ted R. Hunt
Senior Advisor to the Attorney General on Forensic Science
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Department of Justice

Special Topics

Texas Forensic Science Commission

Forensic Analyst Licensing Requirement

Background and History

- The Texas Forensic Science Commission (TFSC) was created in 2005

- Purpose: Investigate allegations of professional negligence or misconduct that would significantly affect the results of forensic analyses conducted by accredited labs & initiate (for "educational purposes") an investigation of "forensic analysis" w/out receiving a complaint

- Scope of TFSC's investigative authority gradually expanded

- 2015 Texas General Assembly passed SB-1287 (codified at TX Code Crim. Pro. 38.01)

Background and History

- SB-1287 gave TFSC an additional role – transferred crime lab accreditation program from TXDPS to TFSC

- SB-1287 also charged TFSC with establishing a licensing program for individual analysts

- Granted authority to establish a Licensing Advisory Committee (LAC) (38.01 4-b)

- LAC provides recommendations to TFSC on a licensing scheme

For Purposes of Forensic Analyst Licensing

"Forensic Analyst": a person who, on behalf of an accredited crime lab technically reviews or performs forensic analysis or draws conclusions from or interprets a forensic analysis for a court or crime laboratory. Does not include a medical examiner or other forensic pathologist who is a licensed physician

"Forensic Analysis": a medical, chemical, toxicologic, ballistic, or other expert examination or test performed on physical evidence, including DNA evidence, for the purpose of determining the connection of the evidence to a criminal action. Includes a test requested by a law enforcement agency, prosecutor, criminal suspect or defendant, or court.

Does NOT include:

- **Latent print examination**
- **Test of a breath specimen**
- **Digital evidence**
- **An examination or test excluded by rule under Article 38.01**
- **A presumptive test performed for compliance with a term or condition of supervision or parole**
- **Actions unrelated to determining connection of physical evidence to a criminal action**

Effective January 1, 2019:

“A person may not act or offer to act as a forensic analyst unless the person holds a forensic analyst license.”

38.01 4-a(d) The commission by rule shall:

(1) establish the qualifications for a license that include:

(A) successful completion of the education requirements established by the commission;

(B) specific course work and experience, including instruction in courtroom testimony and ethics in a crime laboratory;

(C) successful completion of an examination required or recognized by the commission; and

(D) successful completion of proficiency testing to the extent required for crime laboratory accreditation;

(2) set fees for the issuance and renewal of a license; and

(3) establish the term of a forensic analyst license.

38.01 4-a(b) "The commission by rule may establish classifications of forensic analyst licenses if the commission determines that it is necessary to ensure the availability of properly trained and qualified forensic analysts to perform activities regulated by the commission."

"While **the Commission does not believe a blanket exemption for any group of analysts would be appropriate**, Commissioners would consider granting licenses to **all federal analysts practicing in accredited laboratories assuming the following conditions are met**:"

Conditions

1. Report all instances of professional misconduct

2. Comply with the Texas Code of Professional Responsibility for Forensic Analysts and Laboratories

3. Certify that all federal analysts receive training and competency testing in the knowledge-based competency subject areas identified by the Commission, as appropriate for the analysts' particular forensic disciplines.

4. Provides an explanation of the existing training provided to federal analysts in the subject areas covered by the Texas general forensic exam, including: (1) evidence handling; (2) ethics; (3) legal disclosure; (4) human factors; (5) laboratory quality process including root cause analysis; (6) statistics for forensic applications; and (7) courtroom testimony."

5. Take an online training and assessment module addressing Texas jurisprudence with a particular focus on the difference in disclosure requirements between *Brady v. Maryland* and Texas state law under 39.14 (h) of the Texas Code of Criminal Procedure (*aka* the Michael Morton Act.)."

"The Commission understands that federal partners may be called to work cases involving **serious matters of national security or national emergencies where the circumstances are so urgent that the licensing requirement would not be practical or appropriate**. We would like to work with the Department to **draft** a rule affording **an exemption <u>for these circumstances</u>**."

"Because Department personnel routinely perform their duties in multi-jurisdictional settings, **we cannot comply with the conditions for licensure set forth in your letter dated November 7, 2017**. **We welcome the Texas Forensic Science Commission's consideration of an exemption from licensure in what it considers "circumstances . . . so urgent that the licensing requirement would not be practical or appropriate.**"

DOJ Notifications to:

- Texas Governor's Office
- Texas Attorney General's Office
- 4 Texas U.S. Attorneys Office

Potential Consequences:

1) (b) (5) [redacted]

2) (b) (5) [redacted]

3) (b) (5) [redacted]

Anticipated Resolution

- **Mandatory training for all Texas D.A.'s and P.A.'s**
- **Michael Morton Act vs. Brady v. Maryland (obligations/differences)**
- **Lynn Garcia to write article for The *Texas Prosecutor Magazine* explaining prosecutor's discovery obligations**

Anticipated Resolution

- July 20 TFSC Meeting
- Commission Rulemaking
- Blanket Exemption from Licensure
- For Department of Justice/All Federal Agencies (Accredited Labs)
- Exemption Effective 30-45 Days Later

Status & Needs Assessment
Forensic Science Community

Justice for All Reauthorization Act 2016

S. 2577

One Hundred Fourteenth Congress
of the
United States of America

AT THE SECOND SESSION

Begun and held at the City of Washington on Monday, the fourth day of January, two thousand and sixteen

An Act

To protect crime victims' rights, to eliminate the substantial backlog of DNA and other forensic evidence samples to improve and expand the forensic science testing capacity of Federal, State, and local crime laboratories, to increase research and development of new testing technologies, to develop new training programs regarding the collection and use of forensic evidence, to provide post-conviction testing of DNA evidence to exonerate the innocent, to support accreditation efforts of forensic science laboratories and medical examiner offices, to address training and equipment needs, to improve the performance of counsel in State capital cases, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Justice for All Reauthorization Act of 2016".

SEC. 2. CRIME VICTIMS' RIGHTS.

(a) RESTITUTION DURING SUPERVISED RELEASE.—Section 3583(d) of title 18, United States Code, is amended in the first sentence by inserting ", that the defendant make restitution in accordance with sections 3663 and 3663A, or any other statute authorizing a sentence of restitution," after "supervision".

(b) COLLECTION OF RESTITUTION FROM DEFENDANT'S ESTATE.—Section 3613(b) of title 18, United States Code, is amended by adding at the end the following: "The liability to pay restitution shall terminate on the date that is the later of 20 years from the entry of judgment or 20 years after the release from imprisonment of the person ordered to pay restitution. In the event of the death of the person ordered to pay restitution, the individual's

SEC. 16. NEEDS ASSESSMENT OF FORENSIC LABORATORIES

(a) STUDY AND REPORT.—Not later than **October 1, 2018**, the Attorney General shall **conduct a study** and **submit a report** to the Committee on the Judiciary of the Senate and the Committee on the Judiciary of the House of Representatives on the **status and needs of the forensic science community**.

(b) REQUIREMENTS —The report required under subsection (a) shall—

(1) examine the status of **current workload**, **backlog**, **personnel**, **equipment**, and **equipment needs** of **public crime laboratories** and **medical examiner and coroner** offices;

(2) include an overview of **academic forensic science resources and needs**, from a broad forensic science perspective, including **nontraditional** crime laboratory **disciplines** such as forensic anthropology, forensic entomology, and others as determined appropriate by the Attorney General;

(3) consider—

(A) the National Institute of Justice study, **Forensic Sciences: Review of Status and Needs, published in 1999**;

(B) the **Bureau of Justice Statistics census reports** on Publicly Funded Forensic Crime Laboratories, published in 2002, 2005, 2009, and 2014;

(C) the National Academy of Sciences report, **Strengthening Forensic Science: A Path Forward**, published in 2009; and

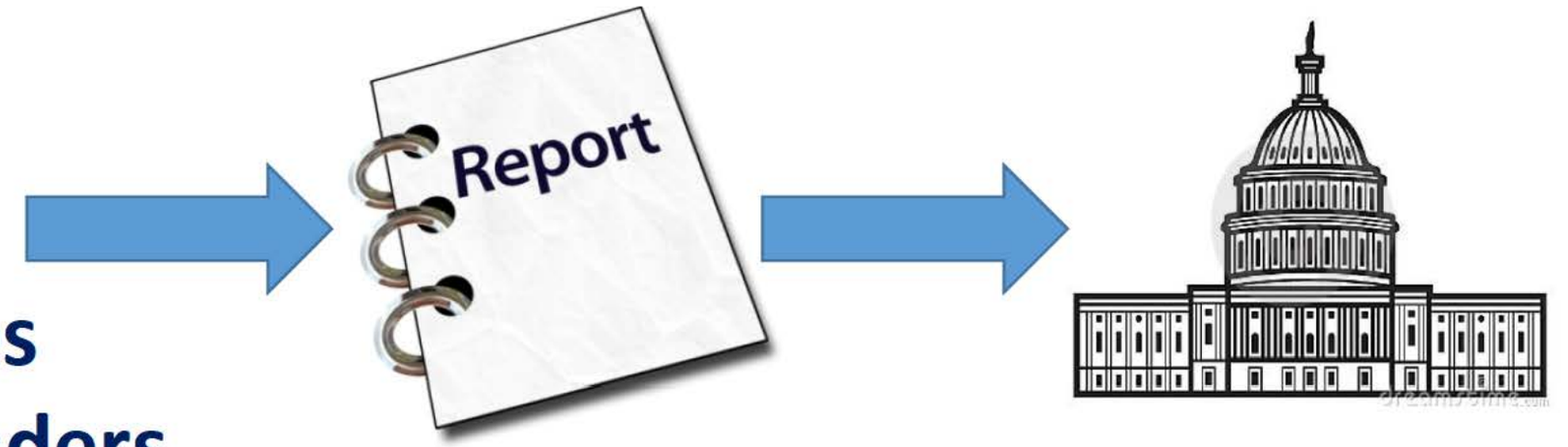
(D) the **Bureau of Justice Statistics survey** of forensic providers **recommended by the National Commission of Forensic Science** and approved by the Attorney General on September 8, 2014 (Does Not Exist)

(4) provide Congress with a **comprehensive view** of the **infrastructure**, **equipment**, and **personnel needs** of the broad **forensic science community**; and

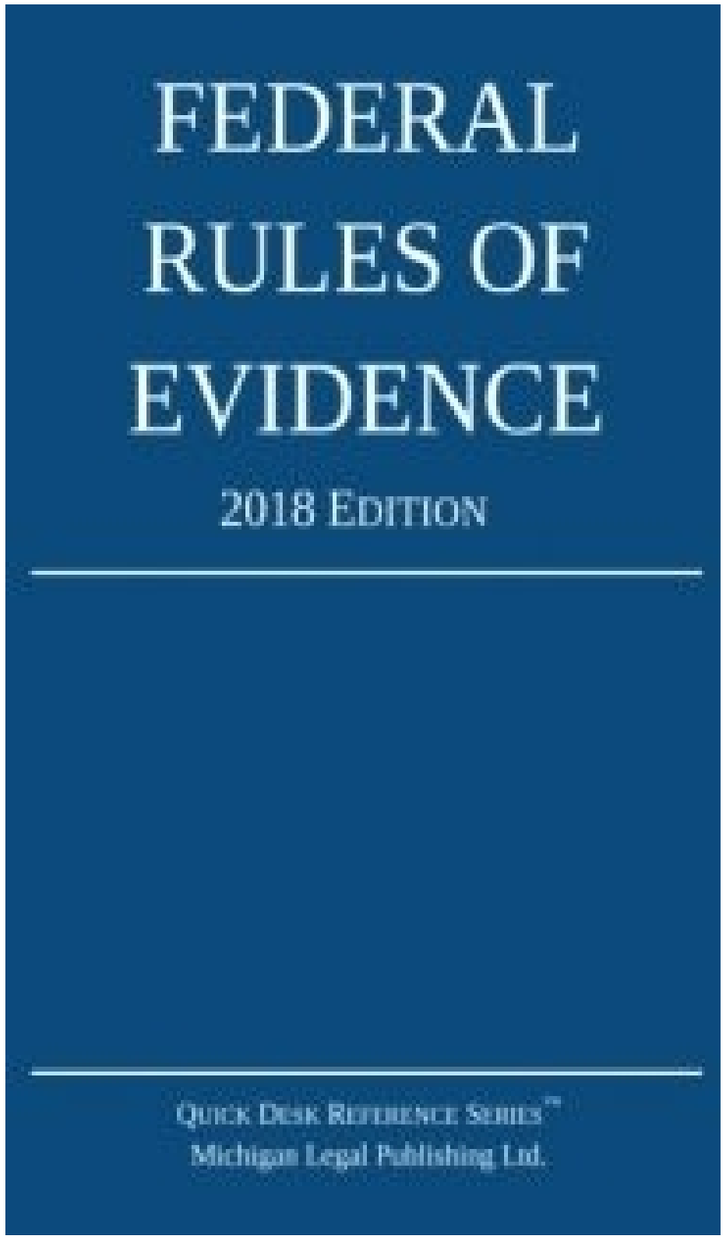
(5) be made **available to the public**.

Listening Sessions

- Forensic Toxicology Community
- IAI
- MDI Community
- ASCLD
- SWGDE
- Attorneys/Judges
- IACP forensic leaders
- FEPAC
- Federal Lab Directors



The PCAST Report
&
The Attempt to Amend FRE Rule 702 (Expert Testimony)



October 27, 2017
Boston College School of Law
Judicial Conference Advisory Committee on Federal Rules

BOSTON COLLEGE LAW

Amend FRE 702 for Forensic Identification?
Create a New Rule for Forensic Identification?
Draft a Best Practices Manual for Judges on Forensic Identification?

BOSTON COLLEGE LAW

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Online

Scientific Validity and Error Rates: A Short Response to the PCAST Report

By Ted Robert Hunt

DOJ Senior Advisor on Forensic Science

Scientific Excellence in the Forensic Science Community

By Alice R. Isenberg & Cary T. Oien

DAD FBI Crime Laboratory

The Reliability of the Adversarial System to Assess the Scientific Validity of Forensic Evidence

By Andrew D. Goldsmith

Associate Deputy Attorney General

Federal Rules Advisory Committee Meeting
Thurgood Marshall
Federal Judiciary Building
Washington, D.C.
April 26, 2018

Options Considered

1) Amend FRE 702

2) Add a comment to the Advisory Committee Note to the Rule

3) Create a best practices manual for judges to utilize when considering the admissibility of forensic evidence

Resolution?

- A rule change will be difficult
- Can’t make an addition to the Committee comment w/out changing the Rule
- A manual or training may not be helpful
- No vote will be held at next meeting

Resolution…

- A small subcommittee will be formed with Department, Public Defender Representatives
- Chaired by a Committee Judge
- To discuss scientific issues in small group setting
- Report back to the Committee
- Following steps unclear

Continuation…

- Coordination with Criminal Rules Committee on Discovery seemed the chosen path forward

- The focus shifted to Fed Rule Crim. Pro 16 – criminal discovery requirements

Back Story

- Judge Jed Rakoff (S.D. NY) (July 2017 email to Committee) and Judge Paul Grimm (D. Md.) (email & article to Committee, December 2017)
- Submitted separate proposals to the Advisory Committee on Criminal Rules
- Amend Rule 16
- Goal: make disclosure requirements for cases involving expert testimony more expansive
- Similar to FRCP 26
- Mini-conference on this issue – fall 2018

Rule 26 – Duty to Disclose; General Provisions Governing Discovery

(B) Witnesses Who Must Provide a Written Report. Unless otherwise stipulated or ordered by the court, this **disclosure must be accompanied by a written report—prepared and signed by the witness—if** the witness is one **retained or specially employed to provide expert testimony in the case or one whose duties as the party's employee regularly involve giving expert testimony.** The **report must contain**:

(i) complete statement of **all opinions** the **witness will express** and **the basis and reasons for them**;

(ii) the **facts or data considered** by the witness **in forming them**;

(iii) **any exhibits** that will be used **to summarize or support them**;

(iv) the **witness's qualifications**, including a **list of all publications authored in the previous 10 years**;

(v) a **list of all other cases in which, during the previous 4 years, the witness testified** as an expert at **trial or by deposition**; and

(vi) a **statement of the compensation to be paid** for the study and testimony in the case.

ANAB Scopes of Accreditation

Guideline for the Formulation of Scopes of Accreditation for Laboratories

"**Conventionally**, the **scope of accreditation** is described using **a fixed list of all methods/ calibration or examination procedures which the laboratory can use when referring to accredited status**. This list is usually an annex to the certificate of accreditation and gives the details in the scope of accreditation."

ILAC G-18, p. 7

Example Scope of Accreditation for Forensic Service Providers Assessed to:

AR 3028, AR 3036, AR 3037, AR 3055

GD 3064	Authority: Vice President	Effective: 2017/12/04

This document includes the disciplines and structure that will be used to create a Scope of Accreditation for ANAB Forensics testing/inspection accreditation programs.

Disciplines have been aligned with the National Institute of Standards and Technology (NIST), Organization of Scientific Area Committees for Forensic Science (OSAC). ANAB is providing example entries for a Scope of Accreditation document. These entries are not exhaustive, and additional entries reflecting services provided (discipline, component/parameter or characteristics, items, equipment, technology), may be appropriate. Contact ANAB at QualityMatters@anab.org to discuss.

Field work is performance of testing/inspection task(s) at a location other than the address(es) listed on the Scope of Accreditation. Application attachment FA 3068 will request information on the discipline(s) and specific component/parameter or characteristic tested or inspected for which field services are provided. The scope of accreditation will indicate if work is performed only at the address listed on the scope, only in the field or both.

Flexible Scope: When noted in the examples below, a flexible scope may be granted when ANAB has confirmed the competence required to develop, validate, and perform quality assurance within this provided service. New or modified methods for the item(s) and equipment/technology(ies) listed in this row on the Scope of Accreditation may be introduced. New measurement principles, item(s), and technology(ies) will require evaluation by ANAB prior to granting a scope extension. Upon request, the forensic service provider must be able to supply information on the specific test or inspection method in use at any point in time for accredited testing/inspection work.

Discipline: Crime Scene Investigation

Component/Parameter or Characteristic Tested/Inspected	Test/Inspection Method	Items Tested/Inspected	Key Equipment or Technology
Scene Documentation	Method (Reference Number or Name)	Location	3D Laser Measurement System, Ground Penetrating Radar
Length Measurement	Method (Reference Number or Name)	Location and Physical Evidence	Refer to Method
Enhancement	Method (Reference Number or Name)	Physical Evidence	Visual, Digital, Physical, Chemical
Presumptive Testing	Method (Reference Number or Name)	Body Fluids, Lead, Drug Tests	Refer to Method
Collection	Method (Reference Number or Name)	Physical Evidence	Refer to Method
Event Reconstruction	Method (Reference Number or Name)	Physical Evidence, Testimonial Evidence, Records	Refer to Method
Trajectory Determination	Method (Reference Number or Name)	Firearm, Firearm Components	Refer to Method

Discipline: Document Examination

Component/Parameter or Characteristic Tested/Inspected	Test/Inspection Method	Items Tested/Inspected	Key Equipment or Technology
Document Authentication	Method (Reference Number or Name)	Documents and Records	Refer to Method
Physical Comparison	Method (Reference Number or Name)	Handwriting, hand printing, documents and records	Refer to Method
Product Determination	Method (Reference Number or Name)	Printer, Typewriter, Copier	Refer to Method

Discipline: Firearms and Toolmarks

Component/Parameter or Characteristic Tested/Inspected	Test/Inspection Method	Items Tested/Inspected	Key Equipment or Technology
Collection	Method (Reference Number or Name)	Physical Evidence	Refer to Method

Discipline: Firearms and Toolmarks

Component/Parameter or Characteristic Tested/Inspected	Test/Inspection Method	Items Tested/Inspected	Key Equipment or Technology
Physical Comparison	Method (Reference Number or Name)	Firearm, Firearm Components, Toolmark, Toolmark Components	Comparison Microscope, Calipers
Determination of Functionality	Method (Reference Number or Name)	Firearm	Refer to Method
Length Measurement	Method (Reference Number or Name)	Firearm	Refer to Method
Serial Number Restoration	Method (Reference Number or Name)	Physical Evidence	Refer to Method
Trigger Pull Force Measurement	Method (Reference Number or Name)	Firearm	Refer to Method
Qualitative Chemical Determination	Method (Reference Number or Name)	Physical Evidence	Color Test
Distance Determination	Method (Reference Number or Name)	Firearm, Firearm Components	Refer to Method
Ejection Pattern Determination	Method (Reference Number or Name)	Firearm, Firearm Components	Refer to Method
Trajectory Determination	Method (Reference Number or Name)	Firearm, Firearm Components	Refer to Method
Product (Make/Model) Determination	Method (Reference Number or Name)	Firearm, Firearm Components	GRC
Individual Characteristic Database	Method (Reference Number or Name)	Firearm, Firearm Components	NIBIN

Discipline: Fire and Explosion Investigation

Component/Parameter or Characteristic Tested	Test Method	Items Tested	Key Equipment or Technology
Scene Documentation	Method (Reference Number or Name)	Field Location	3D Laser Measurement System
Collection	Method (Reference Number or Name)	Physical Evidence	Refer to Test Method

Discipline: Footwear/Tire

Component/Parameter or Characteristic Tested/Inspected	Test/Inspection Method	Items Tested/Inspected	Key Equipment or Technology
Collection	Method (Reference Number or Name)	Footwear Impression/Tire Impression	Electrostatic/Adhesive/ photographically
Enhancement	Method (Reference Number or Name)	Footwear Impression/Tire Impression	Visual (e.g., photoshop), Photography, Physical, Chemical
Physical Comparison	Method (Reference Number or Name)	Footwear Impression/Tire Impression	Refer to Method
Product (Make/Model) Determination	Standard Method (Reference Number or Name)	Footwear Impression/Tire Impression	SICAR, reference material search

Discipline: Friction Ridge

Component/Parameter or Characteristic Tested/Inspected	Test/Inspection Method	Items Tested/Inspected	Key Equipment or Technology
Collection	Method (Reference Number or Name)	Physical Evidence	Photography or Adhesive Lift
Enhancement	Method (Reference Number or Name)	Patent, Latent, Plastic	Visual (e.g., photoshop), Photography, Physical, Chemical
Physical Comparison	Method (Reference Number or Name)	Developed Patent, Latent, or Plastic to a Known; Known to Known	Refer to Method
Individual Characteristic Database	Method (Reference Number or Name)	Developed Patent, Latent, or Plastic or a Known	ABIS

Questions/Comments?

Bode Presentation

From: "Hunt, Ted (ODAG)" <(b) (6)
To: "Hunt, Ted (ODAG)" <(b) (6)
Date: Mon, 02 Apr 2018 11:35:39 -0400
Attachment FINAL Department of Ju tice Update on Foren ic Initiative ppt (3 98 MB)

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)

Bode PPT

From: "Hunt, Ted (ODAG)" <(b) (6)
To: (b) (6) Ted Hunt
Date: Thu, 29 Mar 2018 18:40:48 -0400
Attachment FINAL Department of Ju tice Update on Foren ic Initiative ppt (3 4 MB)

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)

Department of Justice

Update on Forensic Initiatives

Ted R. Hunt

Senior Advisor to the Attorney General on Forensic Science

United States Department of Justice

Topics

- Forensic research
- Application of new/improved technologies or methods
- Quality assurance issues
- Provision of consensus-based position statements to the DAG
- Other represented federal agencies
- Education and training

Mission

- To advise federal government agencies concerned with the formulation/execution of national policies on forensic science

- Forum for consensus building and exchange of information in the development and implementation of policies directly or indirectly related to forensic science

Scope

- Advise represented federal agencies on issues related to the advancement of forensic science

- Through the DAG, the CFFLD may respond to specific requests for assistance or provide consensus-based position statements

- Provided to federal agencies of the judicial or legislative branches and to state and local jurisdictions

Mechanism for
Ongoing Communication/Collaboration & Input

State, Local, Tribal Practitioners

(Pending-Stay Tuned)

II. Increasing the Capacity of Forensic Service Providers

Needs Assessment of Forensic Laboratories

Justice for All Reauthorization Act 2016

S. 2577

One Hundred Fourteenth Congress
of the
United States of America

AT THE SECOND SESSION

Begun and held at the City of Washington on Monday, the fourth day of January, two thousand and sixteen

An Act

To protect crime victims' rights, to eliminate the substantial backlog of DNA and other forensic evidence samples to improve and expand the forensic science testing capacity of Federal, State, and local crime laboratories, to increase research and development of new testing technologies, to develop new training programs regarding the collection and use of forensic evidence, to provide post-conviction testing of DNA evidence to exonerate the innocent, to support accreditation efforts of forensic science laboratories and medical examiner offices, to address training and equipment needs, to improve the performance of counsel in State capital cases, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

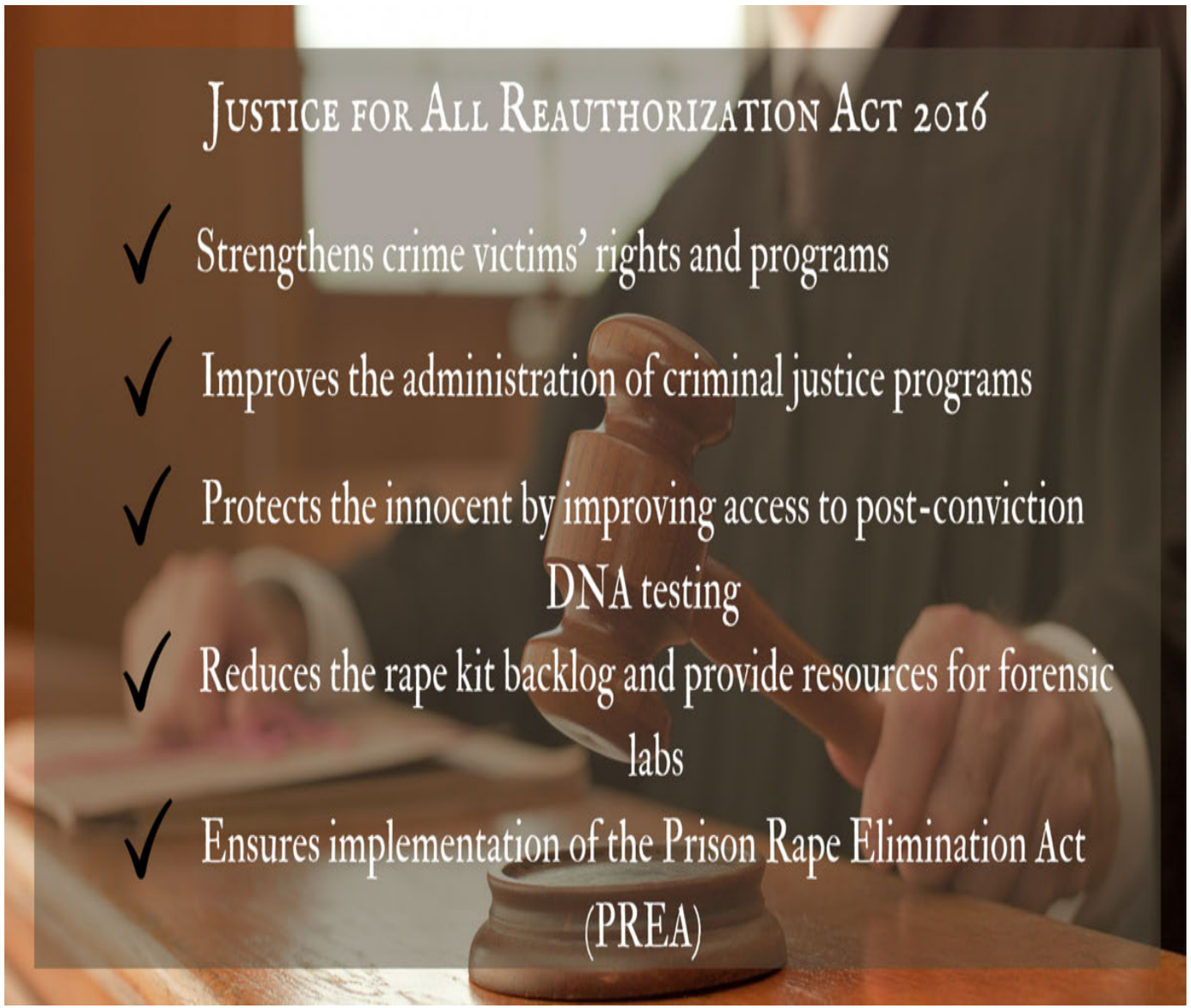
SECTION 1. SHORT TITLE.

This Act may be cited as the "Justice for All Reauthorization Act of 2016".

SEC. 2. CRIME VICTIMS' RIGHTS.

(a) RESTITUTION DURING SUPERVISED RELEASE.—Section 3583(d) of title 18, United States Code, is amended in the first sentence by inserting ", that the defendant make restitution in accordance with sections 3663 and 3663A, or any other statute authorizing a sentence of restitution," after "supervision".

(b) COLLECTION OF RESTITUTION FROM DEFENDANT'S ESTATE.—Section 3613(b) of title 18, United States Code, is amended by adding at the end the following: "The liability to pay restitution shall terminate on the date that is the later of 20 years from the entry of judgment or 20 years after the release from imprisonment of the person ordered to pay restitution. In the event of the death of the person ordered to pay restitution, the individual's



SEC. 16. NEEDS ASSESSMENT OF FORENSIC LABORATORIES

(a) STUDY AND REPORT.—Not later than October 1, 2018, the Attorney General shall **conduct a study** and **submit a report** to the Committee on the Judiciary of the Senate and the Committee on the Judiciary of the House of Representatives on the **status and needs of the forensic science community**.

(b) REQUIREMENTS.—The report required under subsection (a) shall—

(1) examine the status of **current workload**, **backlog**, **personnel**, **equipment**, and **equipment needs** of **public crime laboratories** and **medical examiner and coroner** offices;

(2) include an overview of **academic forensic science resources and needs**, from a broad forensic science perspective, including **nontraditional** crime laboratory **disciplines** such as forensic anthropology, forensic entomology, and others as determined appropriate by the Attorney General;

(3) consider—

(A) the National Institute of Justice study, **Forensic Sciences: Review of Status and Needs, published in 1999**;

(B) the **Bureau of Justice Statistics census reports** on Publicly Funded Forensic Crime Laboratories, published in 2002, 2005, 2009, and 2014;

(C) the National Academy of Sciences report, **Strengthening Forensic Science: A Path Forward**, published in 2009; and

(D) the **Bureau of Justice Statistics survey** of forensic providers **recommended by the National Commission of Forensic Science** and approved by the Attorney General on September 8, 2014;

(4) provide Congress with a comprehensive view of the **infrastructure**, **equipment**, and **personnel needs** of the broad **forensic science community**; and

(5) be made **available to the public**.

Listening Sessions

- Forensic Toxicology Community
- IAI
- MDI Community
- ASCLD
- SWGDE
- Attorneys/Judges
- IACP forensic leaders
- FEPAC
- Federal Lab Directors

Rapid DNA Act of 2017

One Hundred Fifteenth Congress
of the
United States of America

AT THE FIRST SESSION

Begun and held at the City of Washington on Tuesday, the third day of January, two thousand and seventeen

An Act

To establish a system for integration of Rapid DNA instruments for use by law enforcement to reduce violent crime and reduce the current DNA analysis backlog.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Rapid DNA Act of 2017".

SEC. 2. RAPID DNA INSTRUMENTS.

(a) STANDARDS.—Section 210303(a) of the DNA Identification Act of 1994 (42 U.S.C. 14131(a)) is amended by adding at the end the following:

"(5)(A) In addition to issuing standards as provided in paragraphs (1) through (4), the Director of the Federal Bureau of Investigation shall issue standards and procedures for the use of Rapid DNA instruments and resulting DNA analyses.

"(B) In this Act, the term 'Rapid DNA instruments' means instrumentation that carries out a fully automated process to derive a DNA analysis from a DNA sample.".

(b) INDEX.—Paragraph (2) of section 210304(b) of the DNA Identification Act of 1994 (42 U.S.C. 14132(b)(2)) is amended to read as follows:

"(2) prepared by—

"(A) laboratories that—

"(i) have been accredited by a nonprofit professional association of persons actively involved in forensic science that is nationally recognized within the forensic science community; and

Statutory Quality Standards (Analysis & Data)

Indices “shall include only information on DNA Identification records and DNA analyses that are **Based on** analyses”

- Performed **by or on behalf of a criminal justice agency** (or Secretary of Defense)
- In accordance with **publically available standards**
- That **satisfy or exceed** the guidelines for a quality assurance program for DNA analysis **[DNA QAS]**
- **Issued by the Director** of the FBI

DNA Identification Act of 1994
42 USC 14132
(Now 34 USC 12592)

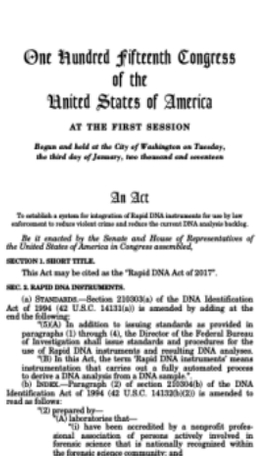
Authorized Analysis Entities

Criminal justice agencies

- **Using Rapid DNA instruments approved by the Director of the FBI**

- In **compliance** with the **standards and procedures** issued by the Director **[pending]**

34 USC 12592(2)(b)
Rapid DNA Act of 2017



H. R. 510

One Hundred Fifteenth Congress
of the
United States of America

AT THE FIRST SESSION

Begun and held at the City of Washington on Tuesday, the third day of January, two thousand and seventeen

An Act

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Rapid DNA Act of 2017 (September 1, 2017)

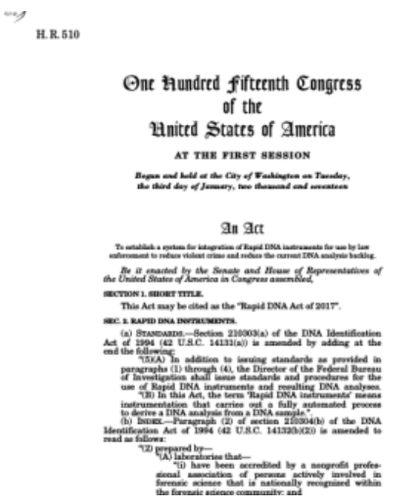
"In this Act, the term 'Rapid DNA instruments' means instrumentation that carries out a **fully automated process** [extraction, amplification, separation, detection, and **interpretation** with no human intervention] to derive a DNA analysis from a DNA sample."

34 USC 12591 (a)(5)(B)

Statutory Quality Standards
(Documentary Standards & Procedures)

"In addition to issuing standards as provided in paragraphs (1) through (4) [DNA QAS], **the Director of the Federal Bureau of Investigation shall issue standards and procedures for the use of Rapid DNA instruments and resulting DNA analyses**."

34 USC 12591 1(A)(5)(A)
Rapid DNA Act of 2017



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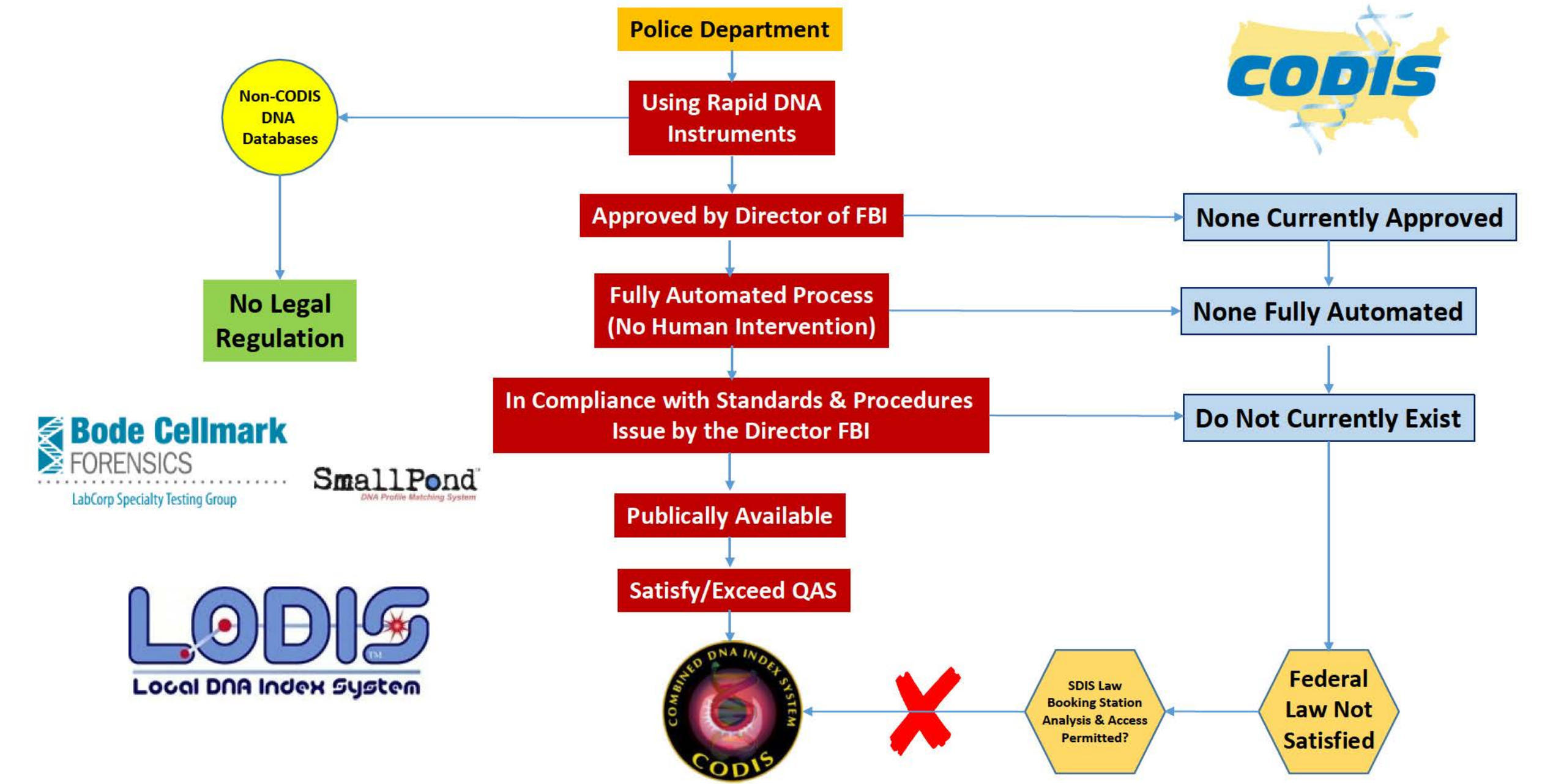
Field Use of Rapid DNA: Statutory Pipeline to CODIS



FBI Rapid DNA Roadmap

2018 Enhanced CODIS Software

- RDIS – 4th Tier of CODIS
- CODIS Rapid Enrollment
- Search-DNA Index of Special Concern (SDIS & NDIS DISC & Subsequent Legacy Searches)

2018 Draft Pilot Plan and Schedule for 2019 Pilots

2018 Draft Authority to Operate Rapid DNA in Booking Stations

2018 Draft Rapid DNA Quality Assurance Standards for Booking Stations

2018 Draft Rapid DNA Procedures for Booking Stations

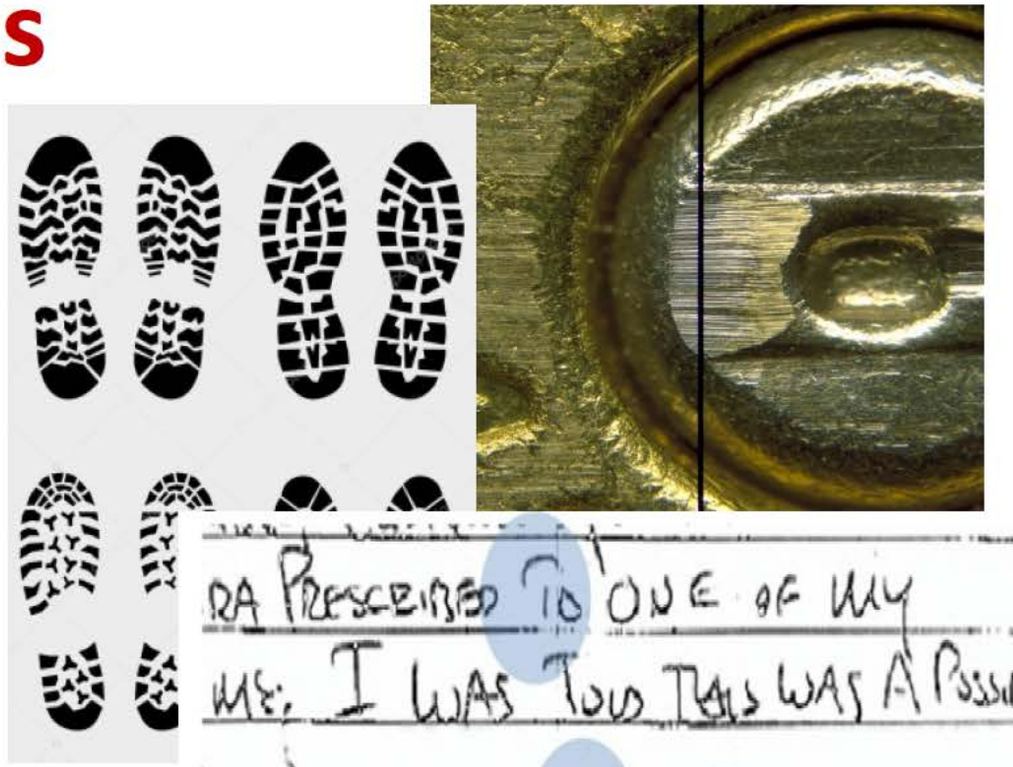
2019 Rapid Booking Station Pilots (AZ, CA, FL, TX)

III. Increasing the **Reliability** of Forensic Evidence

FBI Decision Threshold Studies

Decision Threshold Studies (Black Box)

- Firearms/Toolmarks
- Shoe Print
- Document Examination



Study Attributes

- Discipline-Wide (Fed, State, Local, Private)
- Large-Scale >100s Examiners; 1,000s Samples; >10,000 Individual Decisions
- Double-Blind
- Fully Open Set Design
- Biased Hard
- Multi-Year

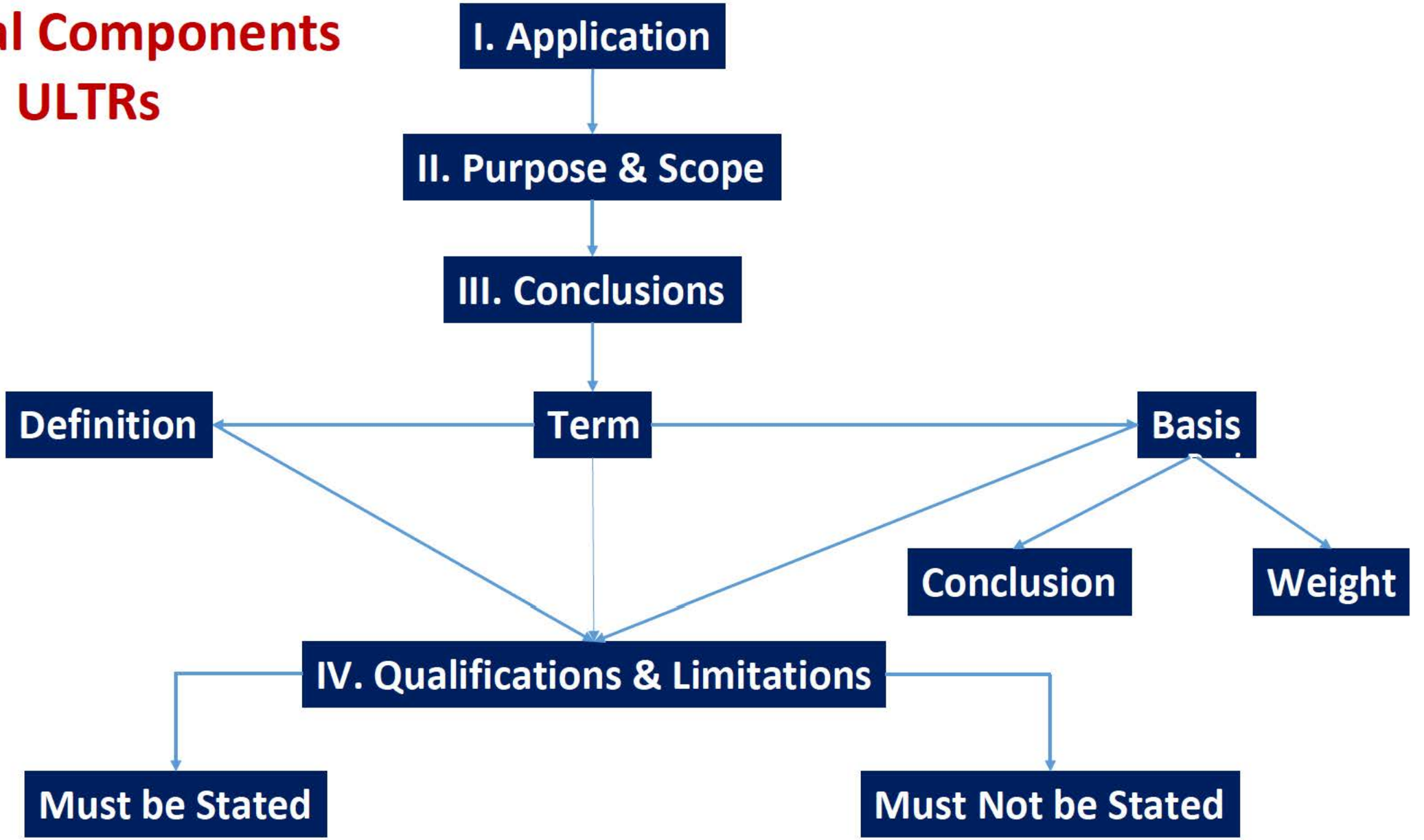
Uniform Language for Testimony and Reports (ULTRs)

Quality Assurance Measure to Correctly Convey Significance and Limitations of Expert Conclusions in Understandable Language

- Scientifically/Technically Justified
- Epistemically Bounded
- Probative Value Correctly Calibrated & Expressed
- Comprehensible Translation to Finder of Fact

- **Uniformity Among Department Forensic Examiners**
- **Uniformity Between Forensic Examiners in same Unit**
- **Uniformity in Testimony & Reports – Same Examiner Over Time**

General Components ULTRs



Latent Print ULTR

- Approved
- Announced at AAFS by DAG Rosenstein
- Online at

- Conclusions are Examiner **Decision-Based**

- Evidence in Support of **Alternative Propositions Evaluated**

- Source Identification = Statement of **Examiner's Belief** (Not Statistically-Derived or Verified Measurement or Comparison)

- Basis of S.I. = Logical, **Evidence-Based Inductive Inference**

Qualifications/Limitations

- Individualize/Individualization
- 100% Level of Certainty
- Infallible/Zero Error Rate
- Number of LP Exams Not Proxy for Accuracy of Instant Conclusion
- Reasonable Degree of Scientific Certainty

Testimony Monitoring Framework

- **Quality Assurance Measure**
- **Department Laboratories**
- **Department Digital Analysis Entities**

- **Analytical Results & Conclusions**
- **Properly Qualified & Appropriately Communicated**
- **Ongoing Assessment of Testimonial Presentations**
- **Highlight Opportunities for Continual Improvement**

Evaluation

- **Consistency with mandatory component policies & procedures regarding analysis of forensic evidence**

- **Opinions, conclusions, and statements regarding case-specific facts & data were properly qualified and did not exceed scientific limitations of the method performed or discipline in question**

- **Conclusions were in conformity with any applicable ULTR**

Posting DOJ Laboratory Documents Online

Online Posting

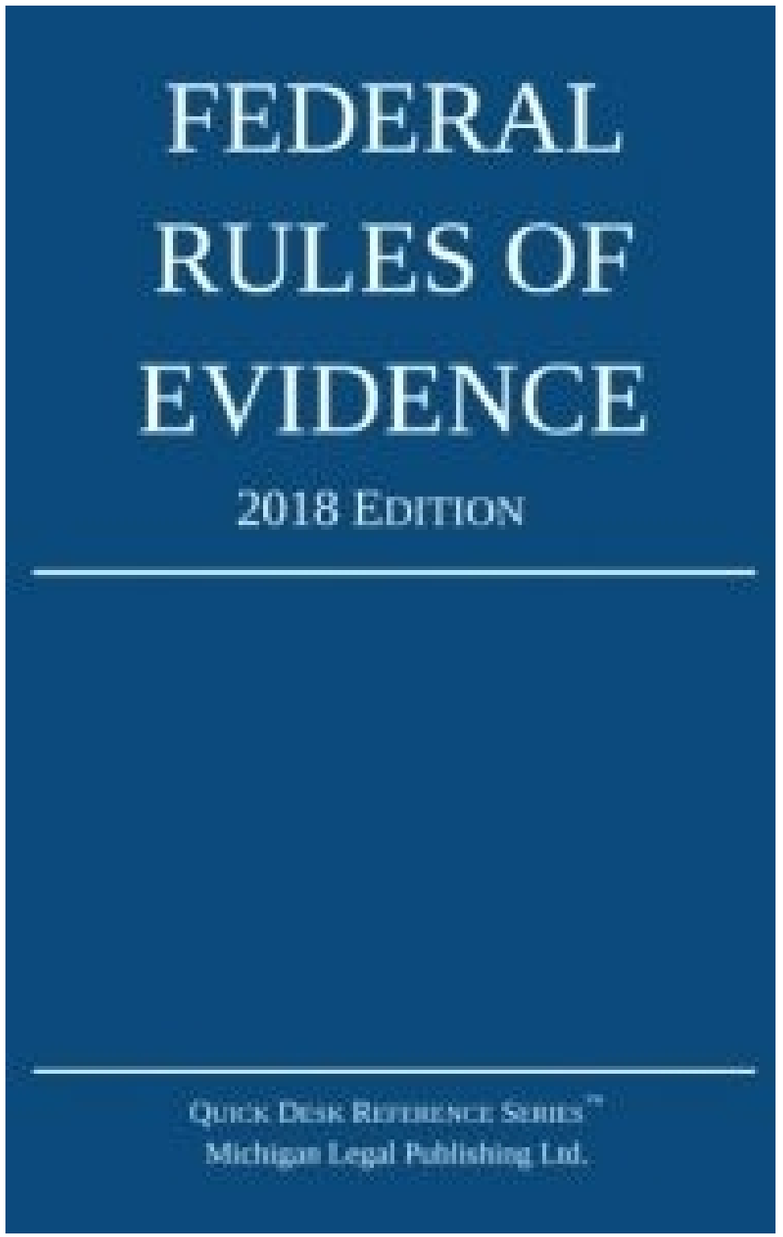
- Each DOJ Laboratory Component
- Current Versions
- Spring 2018

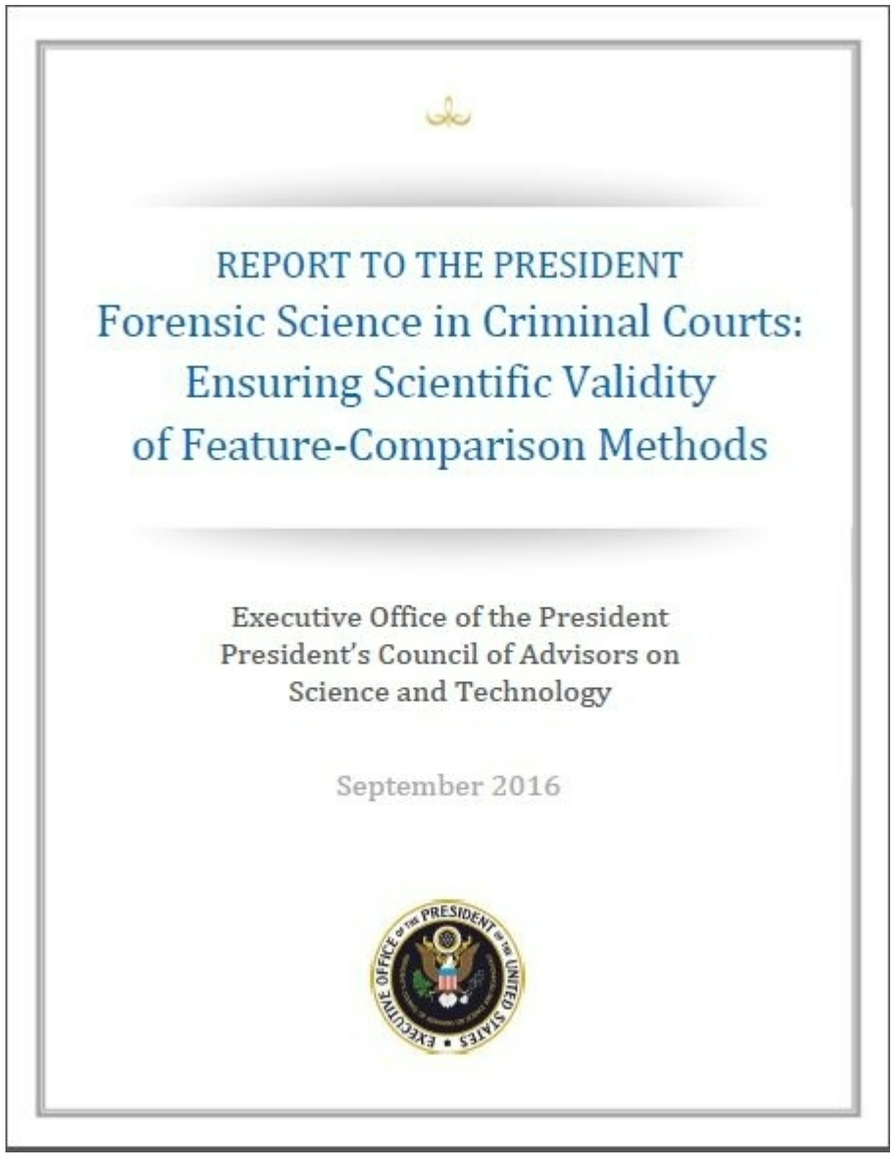
Online Posting

- Quality Management System Documents
- Testing/Analysis/Examination Policies/SOPs
- Validation Study Summaries

- **Transparency** **(Scientific Values)**
- **Discovery & Disclosure Efficiencies** **(Legal Compliance)**
- **Sharing of High Quality SOPs** **(Quality Promotion)**

The PCAST Report
&
The Attempt to Amend FRE Rule 702





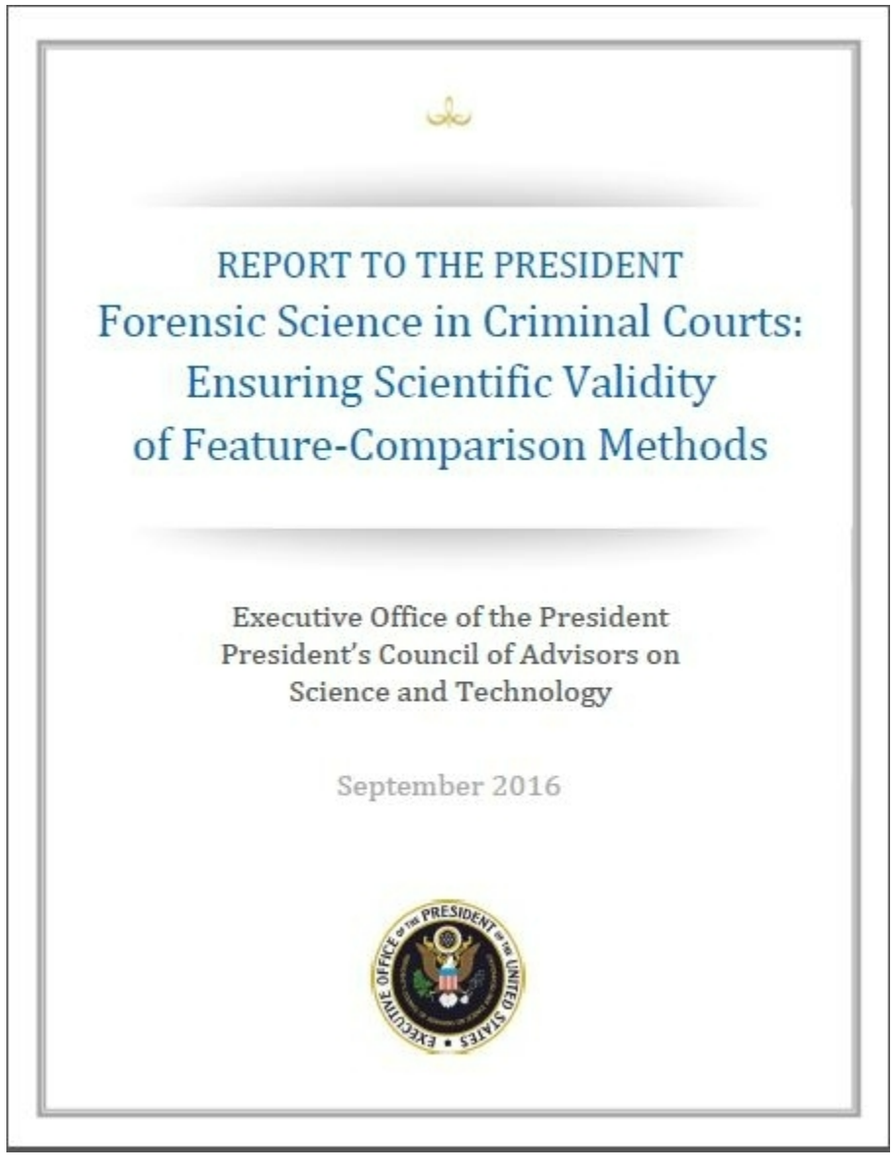
REPORT TO THE PRESIDENT

Forensic Science in Criminal Courts:
Ensuring Scientific Validity
of Feature-Comparison Methods

Executive Office of the President
President's Council of Advisors on
Science and Technology

September 2016

- DNA Mixtures (Single Source + 2 Contributors)
- DNA Mixtures (Complex-More Than 2 Contributors)
- Bitemark Analysis
- Latent Fingerprint Analysis
- Firearms Analysis
- Footwear Analysis
- Hair Analysis (Partial Consideration)

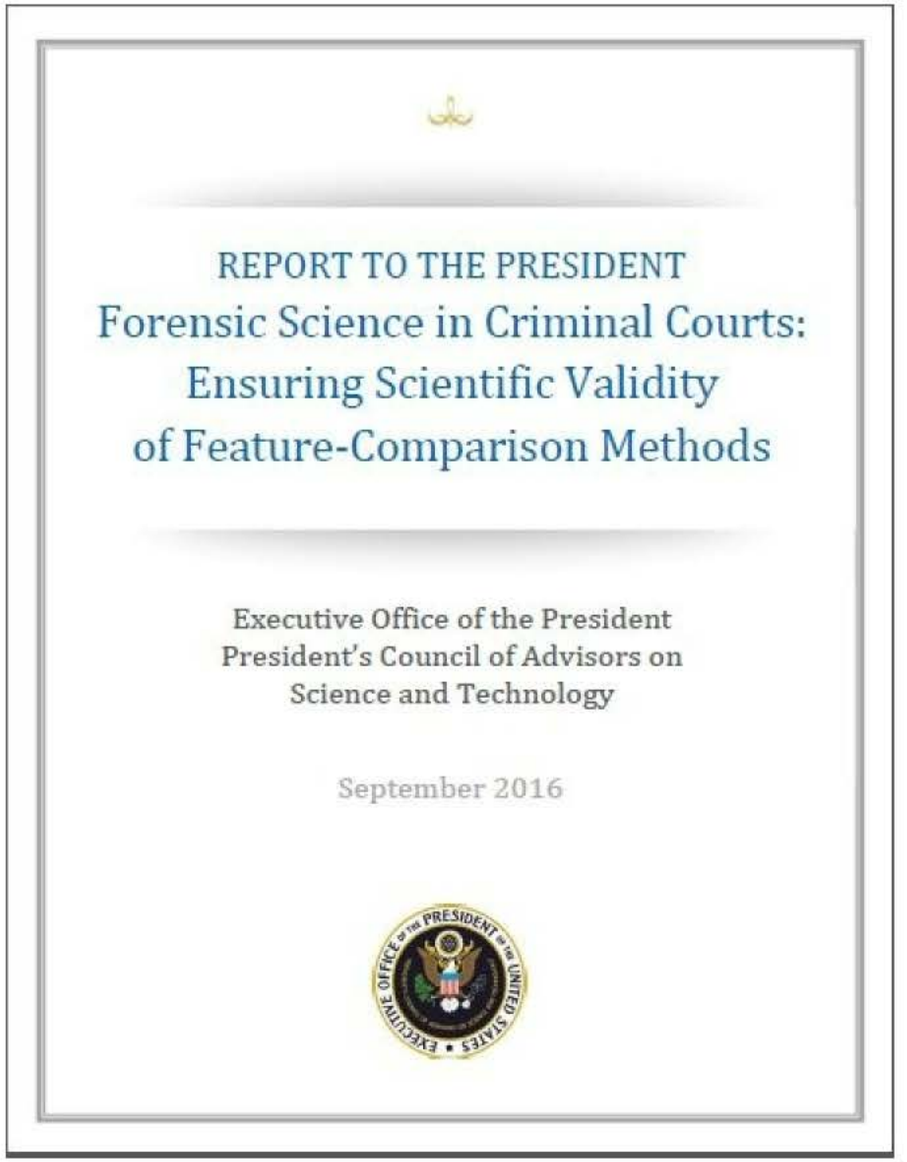


Black Box Studies

"[T]he foundational validity of a subjective method can only be established through multiple, appropriately designed black -box studies." (p. 9).

Error rates

- **Black box study validation is required if method is "subjective" (p. 46, 143).**
- **False + rate must be based solely on # of conclusive determinations rather than proportion of all examinations (p. 51-52).**
- **Only the % of FP's that occupy upper bound of 95% UCL should be reported. To even report an accurate lower bound would be an attempt at "obfuscation." (p. 153).**
- **Examiners who took no part in these studies should testify that the black box FP error rate is applicable to the case at hand (p. 56, 66, 112, 147, 150)**



REPORT TO THE PRESIDENT

Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods

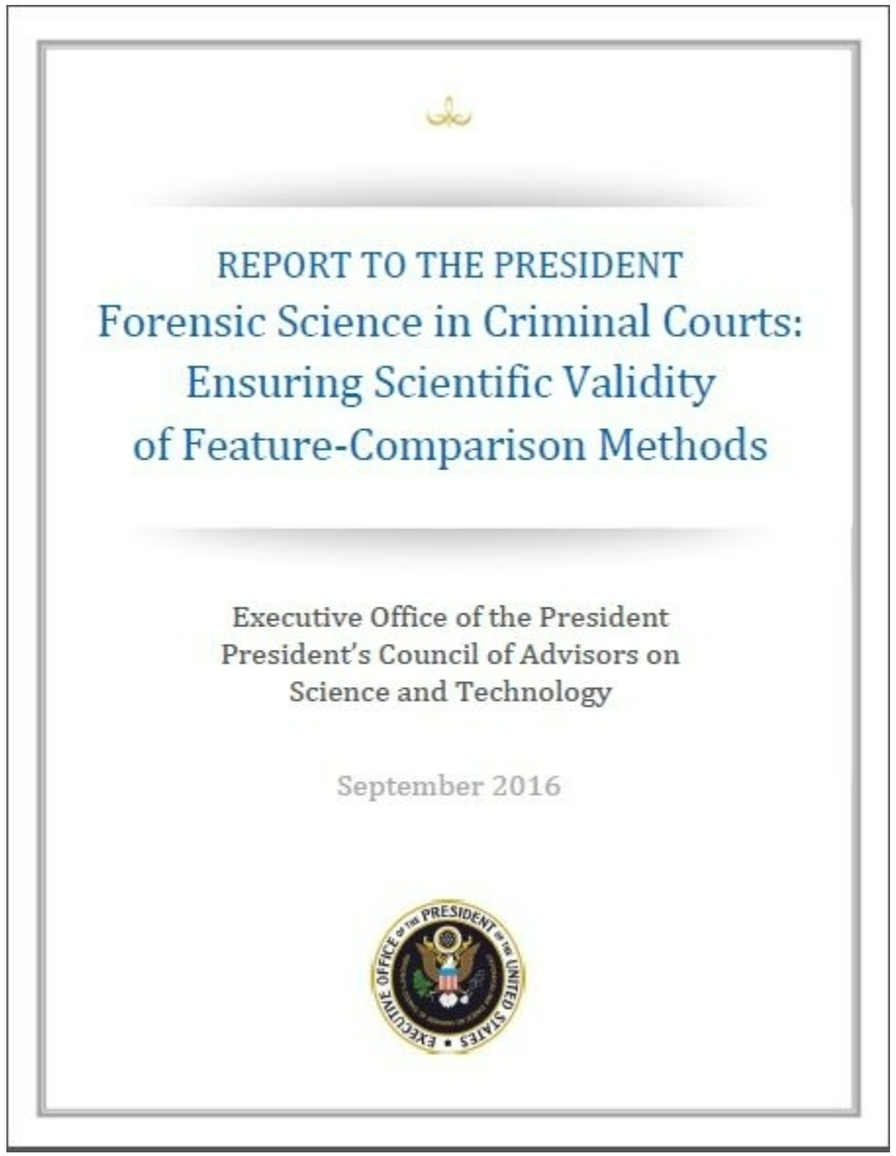
Executive Office of the President
President's Council of Advisors on Science and Technology

September 2016

"Judges' decisions about the admissibility of scientific evidence rest solely on *legal* standards; they are exclusively the province of the courts and **PCAST does not opine on them**." (p. 4).

PCAST expresses no view on the legal question of whether any past cases were "erroneously decided." **However**, PCAST notes that, **from a *scientific* standpoint, subsequent events have indeed undermined the continuing validity of conclusions that were not based on appropriate empirical evidence**. (p. 144).

"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**." (p. 144).


REPORT TO THE PRESIDENT

Forensic Science in Criminal Courts:
Ensuring Scientific Validity
of Feature-Comparison Methods

Executive Office of the President
President's Council of Advisors on
Science and Technology

September 2016

PCAST recommends that the Judicial Conference of the United States, through its Subcommittee on the Federal Rules of Evidence, develop best practices manuals and an Advisory Committee note and the Federal Judicial Center develop educational programs related to procedures for evaluating the scientific validity of forensic feature-comparison methods. (p. 145).

October 27, 2017
Boston College School of Law
Judicial Conference Advisory Committee on Federal Rules

BOSTON COLLEGE LAW

Amend FRE 702 for Forensic Identification?
Create a New Rule for Forensic Identification?
Draft a Best Practices Manual for Judges on Forensic Identification?

BOSTON COLLEGE LAW

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Dr. Thomas Albright
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Prof. Stephen A. Saltzburg
Dr. Jeff Salyards
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Thomas M. Sobol, Esq.

Forensic Expert Testimony, Daubert, and Rule 702

March 2018 | Vol. 86, No. 4

Fixing Rule 702: The PCAST Report and Steps to Ensure the Reliability of Forensic Feature-Comparison Methods in the Criminal Courts

By Eric S. Lander

Online

Scientific Validity and Error Rates: A Short Response to the PCAST Report

By Ted Robert Hunt

DOJ Senior Advisor on Forensic Science

Scientific Excellence in the Forensic Science Community

By Alice R. Isenberg & Cary T. Oien

DAD FBI Crime Laboratory

The Reliability of the Adversarial System to Assess the Scientific Validity of Forensic Evidence

By Andrew D. Goldsmith

Associate Deputy Attorney General

Federal Rules Advisory Committee Meeting
Thurgood Marshall
Federal Judiciary Building
Washington, D.C.
April 26, 2018

Questions?

Final Bode Presentation

From: "Hunt, Ted (ODAG)" <(b) (6)
To: (b) (6) Ted Hunt
Date: Tue, 03 Apr 2018 11:00:25 -0400
Attachment FINAL Department of Ju tice Update on Foren ic Initiative ppt (4 13 MB)

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)
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Department of Justice

Update on Forensic Initiatives

Ted R. Hunt

Senior Advisor to the Attorney General on Forensic Science

United States Department of Justice

Focus on 3 Critical Areas

I. Increasing Coordination and Collaboration on Forensic Science

II. Increasing the Capacity of Forensic Service Providers

III. Improving the Validity & Reliability of Forensic Analysis

I. Increasing Coordination and Collaboration on Forensic Science

- Within the Department
- Across the Federal Government
- With State, Local, & Tribal Entities

Appointment
Senior Advisor on Forensic Science

Forensic Science Working Group

- Department Working Group
- Chaired by Senior Advisor on Forensic Science
- Department Components Represented
- Meet Bi-Monthly
- Proactive & Reactive to Emerging Issues

Council of Federal Forensic Laboratory Directors (CFFLD)

CFFLD

- First established 2005
- Attorney General Alberto Gonzales
- Re-chartered 2018 by DAG Rosenstein
- Announced at AAFS Seattle (February 2018)
- First Meeting: May 21, Atlanta, Georgia at ASCLD

Administration

- Coordinated through the ODAG
- Chaired by a DOJ crime lab director
- Designated by the DAG
- Vice-Chair-non-DOJ voting member

Mission

- Advise federal agencies concerned with formulation & execution of national policies on forensic science

- Forum for consensus building and exchange of information regarding implementation of policies related to forensic science

Scope

- Advise represented federal agencies on issues related to the advancement of forensic science

- Through the DAG, the CFFLD may respond to requests for assistance or provide consensus-based position statements

- Provided to federal agencies of the judicial or legislative branches and to state and local jurisdictions

Topics

- Forensic research
- Application of new/improved technologies or methods
- Quality assurance issues
- Provision of consensus-based position statements to the DAG
- Other represented federal agencies
- Education and training

Mechanism for
Ongoing Communication/Collaboration & Input

State, Local, Tribal Practitioners

(Pending-Stay Tuned)

II. Increasing the Capacity of Forensic Service Providers

Status & Needs Assessment
Forensic Science Community

Justice for All Reauthorization Act 2016

S. 2577

One Hundred Fourteenth Congress
of the
United States of America

AT THE SECOND SESSION

Begun and held at the City of Washington on Monday, the fourth day of January, two thousand and sixteen

An Act

To protect crime victims' rights, to eliminate the substantial backlog of DNA and other forensic evidence samples to improve and expand the forensic science testing capacity of Federal, State, and local crime laboratories, to increase research and development of new testing technologies, to develop new training programs regarding the collection and use of forensic evidence, to provide post-conviction testing of DNA evidence to exonerate the innocent, to support accreditation efforts of forensic science laboratories and medical examiner offices, to address training and equipment needs, to improve the performance of counsel in State capital cases, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Justice for All Reauthorization Act of 2016".

SEC. 2. CRIME VICTIMS' RIGHTS.

(a) RESTITUTION DURING SUPERVISED RELEASE.—Section 3583(d) of title 18, United States Code, is amended in the first sentence by inserting ", that the defendant make restitution in accordance with sections 3663 and 3663A, or any other statute authorizing a sentence of restitution," after "supervision".

(b) COLLECTION OF RESTITUTION FROM DEFENDANT'S ESTATE.—Section 3613(b) of title 18, United States Code, is amended by adding at the end the following: "The liability to pay restitution shall terminate on the date that is the later of 20 years from the entry of judgment or 20 years after the release from imprisonment of the person ordered to pay restitution. In the event of the death of the person ordered to pay restitution, the individual's

SEC. 16. NEEDS ASSESSMENT OF FORENSIC LABORATORIES

(a) STUDY AND REPORT.—Not later than October 1, 2018, the Attorney General shall **conduct a study** and **submit a report** to the Committee on the Judiciary of the Senate and the Committee on the Judiciary of the House of Representatives on the **status and needs of the forensic science community**.

(b) REQUIREMENTS.—The report required under subsection (a) shall—

(1) examine the status of **current workload**, **backlog**, **personnel**, **equipment**, and **equipment needs** of **public crime laboratories** and **medical examiner and coroner** offices;

(2) include an overview of **academic forensic science resources and needs**, from a broad forensic science perspective, including **nontraditional** crime laboratory **disciplines** such as forensic anthropology, forensic entomology, and others as determined appropriate by the Attorney General;

(3) consider—

(A) the National Institute of Justice study, **Forensic Sciences: Review of Status and Needs, published in 1999**;

(B) the **Bureau of Justice Statistics census reports** on Publicly Funded Forensic Crime Laboratories, published in 2002, 2005, 2009, and 2014;

(C) the National Academy of Sciences report, **Strengthening Forensic Science: A Path Forward**, published in 2009; and

(D) the **Bureau of Justice Statistics survey** of forensic providers **recommended by the National Commission of Forensic Science** and approved by the Attorney General on September 8, 2014;

(4) provide Congress with a comprehensive view of the **infrastructure**, **equipment**, and **personnel needs** of the broad **forensic science community**; and

(5) be made **available to the public**.

Listening Sessions

- Forensic Toxicology Community
- IAI
- MDI Community
- ASCLD
- SWGDE
- Attorneys/Judges
- IACP forensic leaders
- FEPAC
- Federal Lab Directors

Rapid DNA Act 2017

H. R. 510

One Hundred Fifteenth Congress
of the
United States of America

AT THE FIRST SESSION

Begun and held at the City of Washington on Tuesday, the third day of January, two thousand and seventeen

An Act

To establish a system for integration of Rapid DNA instruments for use by law enforcement to reduce violent crime and reduce the current DNA analysis backlog.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Rapid DNA Act of 2017".

SEC. 2. RAPID DNA INSTRUMENTS.

(a) STANDARDS.—Section 210303(a) of the DNA Identification Act of 1994 (42 U.S.C. 14131(a)) is amended by adding at the end the following:

"(5)(A) In addition to issuing standards as provided in paragraphs (1) through (4), the Director of the Federal Bureau of Investigation shall issue standards and procedures for the use of Rapid DNA instruments and resulting DNA analyses.

"(B) In this Act, the term 'Rapid DNA instruments' means instrumentation that carries out a fully automated process to derive a DNA analysis from a DNA sample.".

(b) INDEX.—Paragraph (2) of section 210304(b) of the DNA Identification Act of 1994 (42 U.S.C. 14132(b)(2)) is amended to read as follows:

"(2) prepared by—

"(A) laboratories that—

"(i) have been accredited by a nonprofit professional association of persons actively involved in forensic science that is nationally recognized within the forensic science community; and

Statutory Quality Standards (Analysis & Data)

Indices "shall include only information on DNA Identification records and DNA analyses that are **Based on** analyses"

- Performed **by or on behalf of a criminal justice agency** (or Secretary of Defense)
- In accordance with **publically available standards**
- That **satisfy or exceed** the guidelines for a quality assurance program for DNA analysis **[DNA QAS]**
- **Issued by the Director** of the FBI

DNA Identification Act of 1994
42 USC 14132
(Now 34 USC 12592)

Authorized Analysis Entities

Criminal justice agencies

- **Using Rapid DNA instruments approved by the Director of the FBI**

- In **compliance** with the **standards and procedures** issued by the Director **[pending]**

34 USC 12592(2)(b)
Rapid DNA Act of 2017

H. R. 510

One Hundred Fifteenth Congress
of the
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AT THE FIRST SESSION

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Rapid DNA Act of 2017 (September 1, 2017)

"In this Act, the term 'Rapid DNA instruments' means instrumentation that carries out a **fully automated process** [extraction, amplification, separation, detection, and **interpretation** with no human intervention] to derive a DNA analysis from a DNA sample."

34 USC 12591 (a)(5)(B)

Statutory Quality Standards (Documentary Standards & Procedures)

"In addition to issuing standards as provided in paragraphs (1) through (4) [DNA QAS], **the Director of the Federal Bureau of Investigation shall issue standards and procedures for the use of Rapid DNA instruments and resulting DNA analyses**."

34 USC 12591 1(A)(5)(A)
Rapid DNA Act of 2017

H. R. 510

One Hundred Fifteenth Congress
of the
United States of America

AT THE FIRST SESSION

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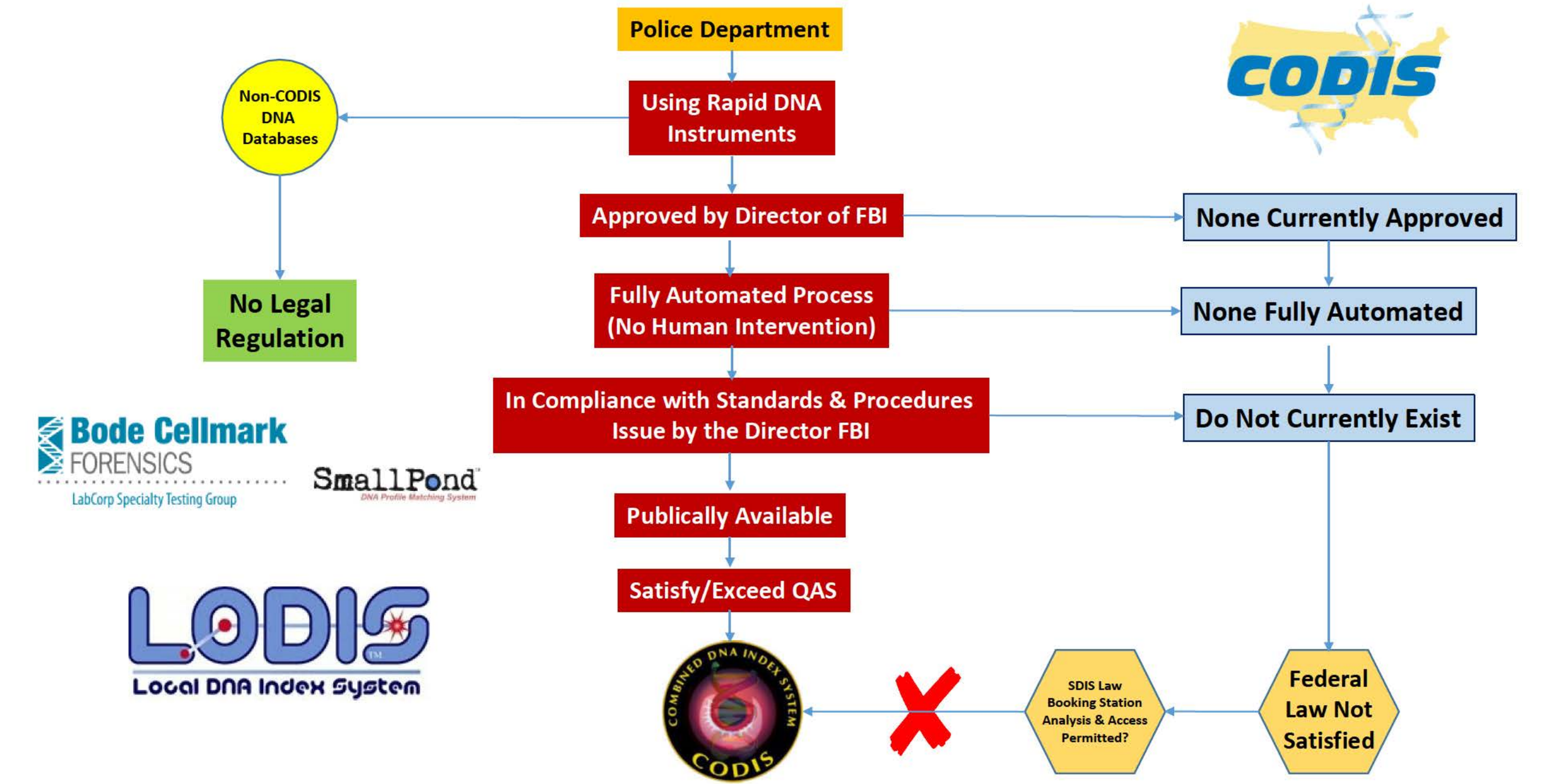
Field Use of Rapid DNA: Statutory Pipeline to CODIS



FBI Rapid DNA Roadmap

2018 Enhanced CODIS Software

- RDIS – 4th Tier of CODIS
- CODIS Rapid Enrollment
- Search-DNA Index of Special Concern (SDIS & NDIS DISC & Subsequent Legacy Searches)

2018 Draft Pilot Plan and Schedule for 2019 Pilots

2018 Draft Authority to Operate Rapid DNA in Booking Stations

2018 Draft Rapid DNA Quality Assurance Standards for Booking Stations

2018 Draft Rapid DNA Procedures for Booking Stations

2019 Rapid Booking Station Pilots (AZ, CA, FL, LA, TX)

Filed 4/2/18

IN THE SUPREME COURT OF CALIFORNIA

THE PEOPLE,

Plaintiff and Respondent,

v.

MARK BUZA,

Defendant and Appellant.

S223698

Ct.App. 1/2 A125542

San Francisco County
Super. Ct. No. SCN 207818

In 2004, California voters passed Proposition 69 (Prop. 69, as approved by voters, Gen. Elec. (Nov. 2, 2004); known as the "DNA Fingerprint, Unsolved Crime and Innocence Protection Act" (DNA Act)) to expand existing requirements for the collection of DNA identification information for law enforcement purposes. The DNA Act requires law enforcement officials to collect DNA

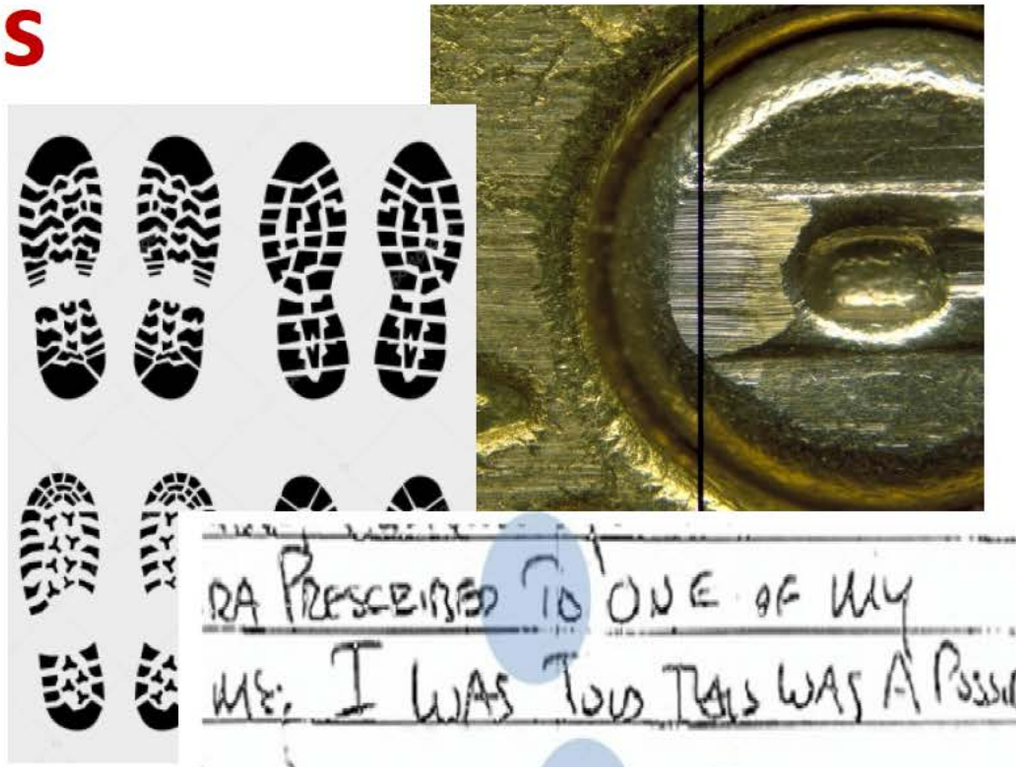
- Decided Monday
- Arrestee DNA Collection
- Cal. Prop. 69 (2004)
- State Constitution Not Violated
- Federal Constitution Not Violated
- Reversed 2014 Cal Ct. App. Decision
- Held Cal. Const. Art 1 Sec 13 Violated

III. Increasing the Validity & Reliability of Forensic Evidence

FBI Decision Threshold Studies

Decision Threshold Studies (Black Box)

- Firearms/Toolmarks
- Shoe Print
- Document Examination



Study Attributes

- Discipline-Wide (Fed, State, Local, Private)
- Large-Scale >100s Examiners; 1,000s Samples; >10,000 Individual Decisions
- Fully Open Set Design
- Biased Hard
- Multi-Year

Uniform Language Testimony and Reports

(ULTRs)

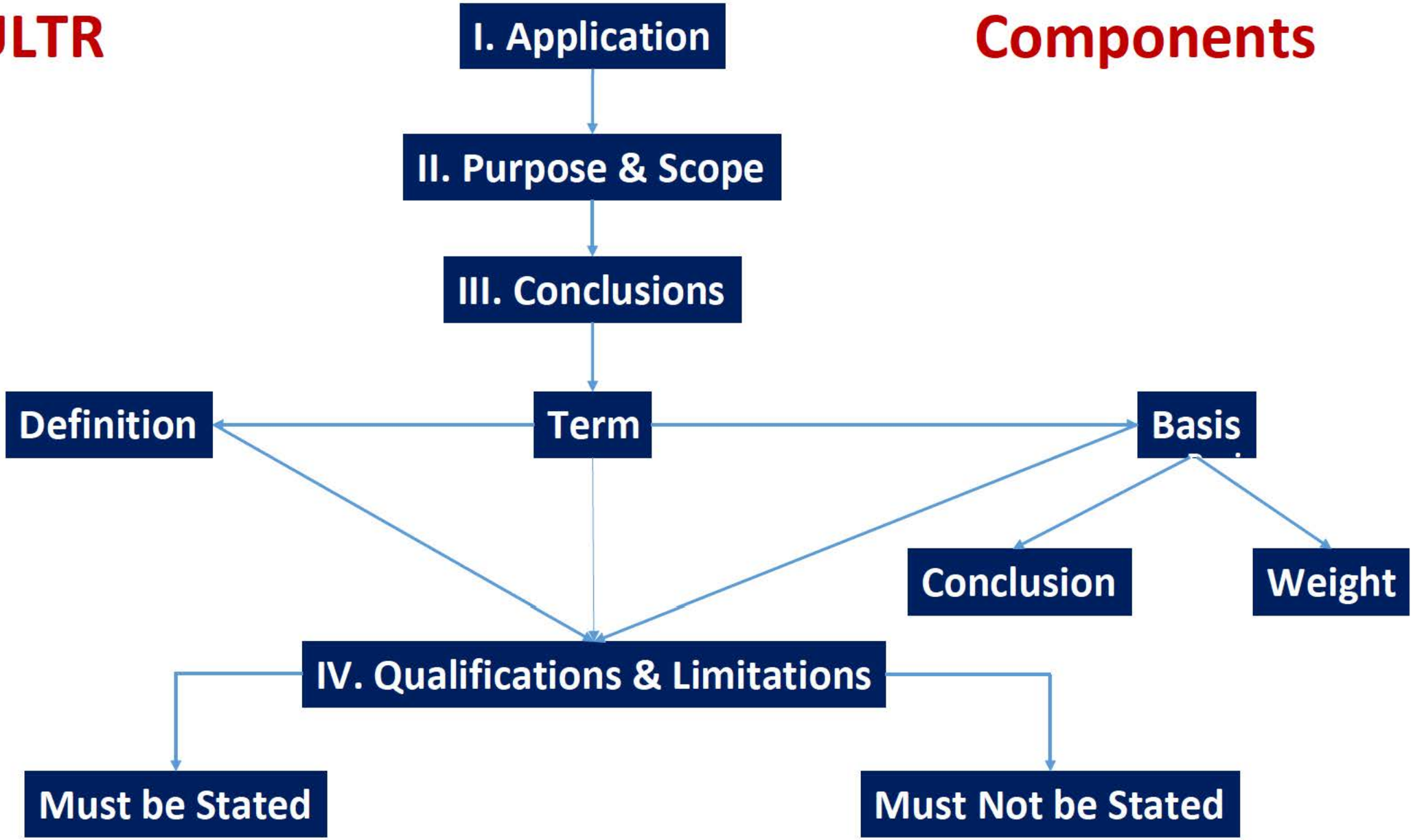
A Quality Assurance Measure to Correctly Convey Significance and Limitations of Expert Conclusions in Understandable Language

- Scientifically/Technically Justified
- Epistemically Bounded
- Probative Value Correctly Formulated & Expressed
- Comprehensible Translation to Finder of Fact

Purpose

- Uniformity of Language in Testimony & Reports
- Consistency Among Department Forensic Examiners
- Consistency Between Forensic Examiners in Same Lab
- Enhanced Quality of Testimony & Reports

ULTR Components



Latent Print ULTR

- Approved
- Announced at AAFS by DAG Rosenstein
- Online at: https://www.justice.gov/file/1036801/download

- Conclusions are Examiner **Decision-Based**

- Evidence in Support of **Alternative Propositions Evaluated**

- Source Identification = Statement of **Examiner's Belief** (Not Statistically-Derived or Verified Measurement or Comparison)

- Basis of Source Identification = Logical, **Evidence-Based Inductive Inference**

Qualifications/Limitations

- Individualize/Individualization
- 100% Level of Certainty
- Infallible/Zero Error Rate
- Number of LP Exams Not Proxy for Accuracy of Instant Conclusion
- Reasonable Degree of Scientific Certainty

Testimony Monitoring Framework

Testimony Monitoring

- Quality Assurance Measure
- Department Laboratories
- Department Digital Analysis Entities

Testimony Monitoring

- Testimonial Statements & Conclusions
- Properly Qualified & Appropriately Communicated
- Ongoing Assessment of Testimonial Presentations
- Highlight Opportunities for Continual Improvement

Evaluation

- Consistency with mandatory component policies & procedures regarding analysis of forensic evidence

- Opinions, conclusions, and statements regarding case-specific facts & data were properly qualified and did not exceed scientific limitations of the method performed or discipline in question

- Conclusions were in conformity with any applicable ULTR

Posting DOJ Laboratory Documents Online

Online Posting

- Quality Management System Documents
- Testing/Analysis/Examination Policies/SOPs
- Validation Study Summaries

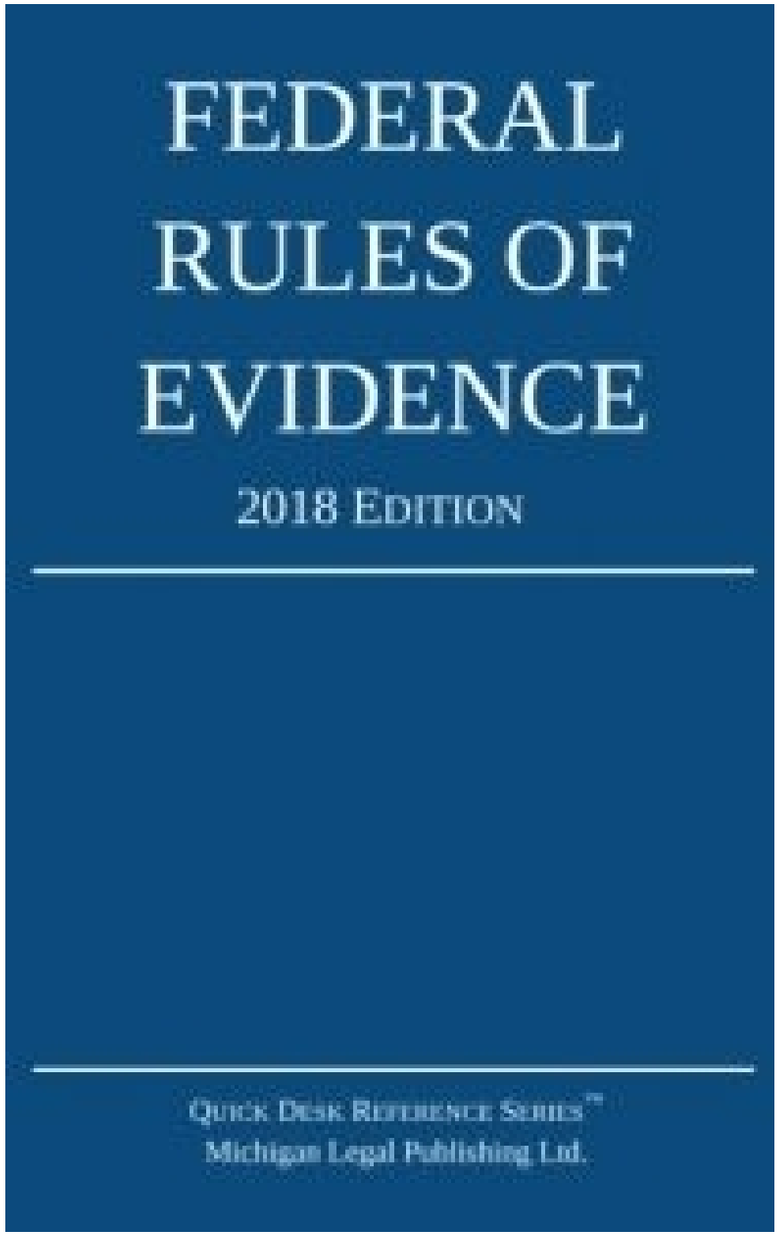
Online Posting

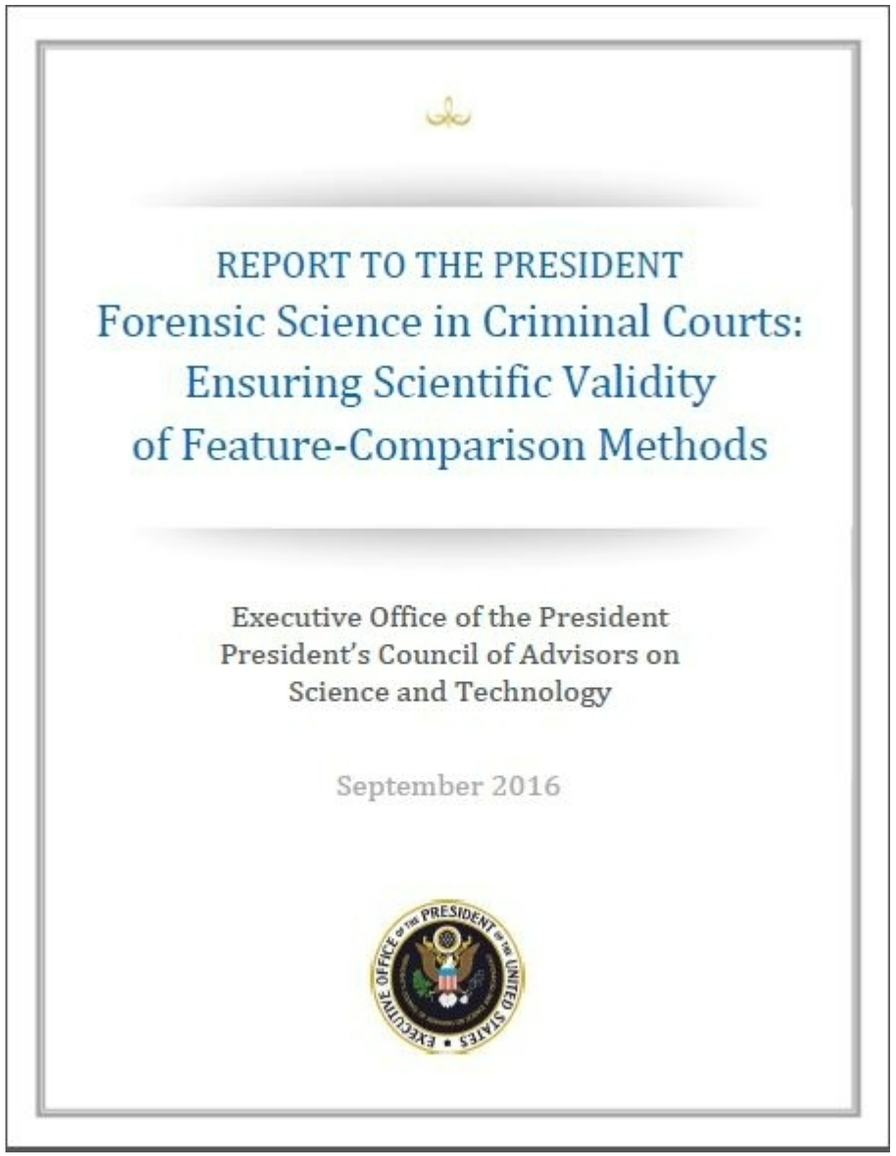
- Each DOJ Laboratory Component
- Current Version of Documents
- Spring 2018

Principles & Utilities

- **Transparency** **(Scientific Values)**
- **Discovery & Disclosure Efficiencies** **(Legal Compliance)**
- **Sharing of High Quality SOPs** **(Quality Promotion)**

The PCAST Report
&
The Attempt to Amend FRE Rule 702 (Expert Testimony)





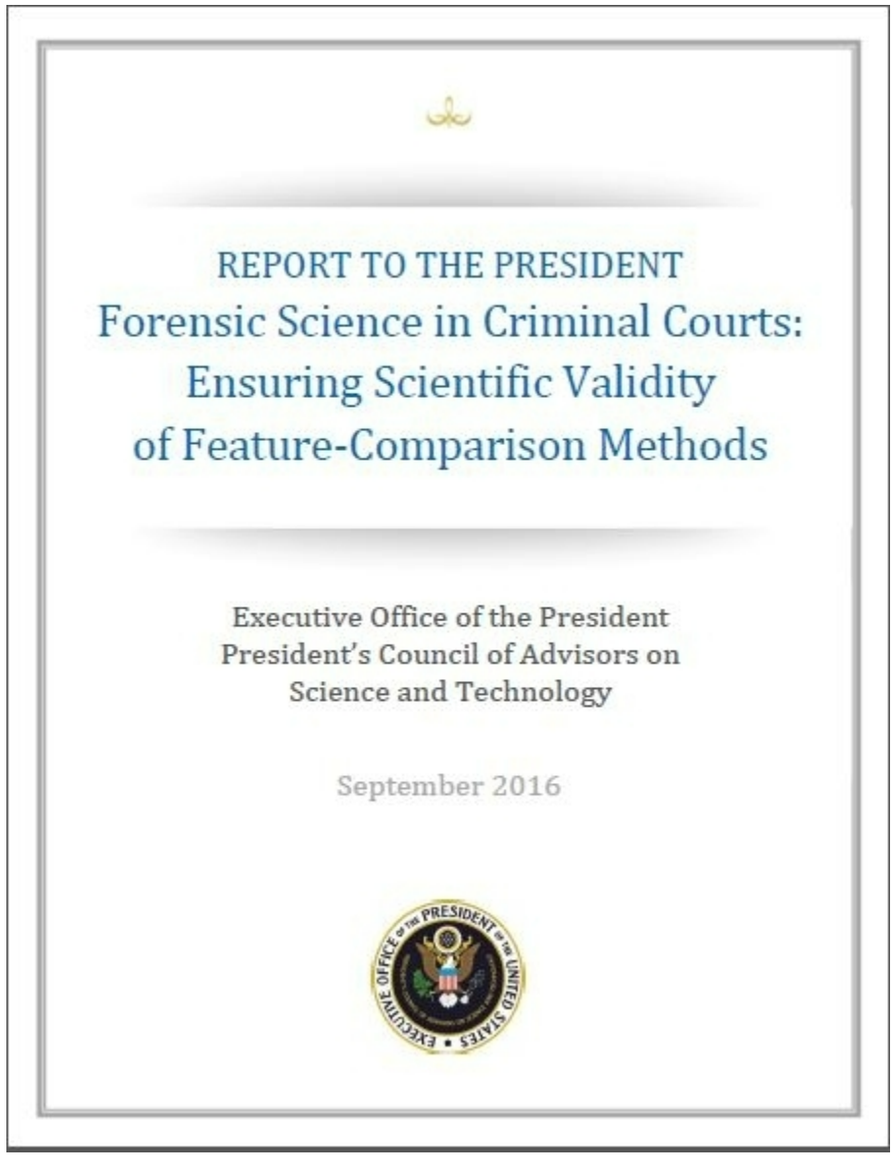
REPORT TO THE PRESIDENT

Forensic Science in Criminal Courts:
Ensuring Scientific Validity
of Feature-Comparison Methods

Executive Office of the President
President's Council of Advisors on
Science and Technology

September 2016

- DNA Mixtures (Single Source + 2 Contributors)
- DNA Mixtures (Complex-More Than 2 Contributors)
- Bitemark Analysis
- Latent Fingerprint Analysis
- Firearms Analysis
- Footwear Analysis
- Hair Analysis (Partial Consideration)


REPORT TO THE PRESIDENT

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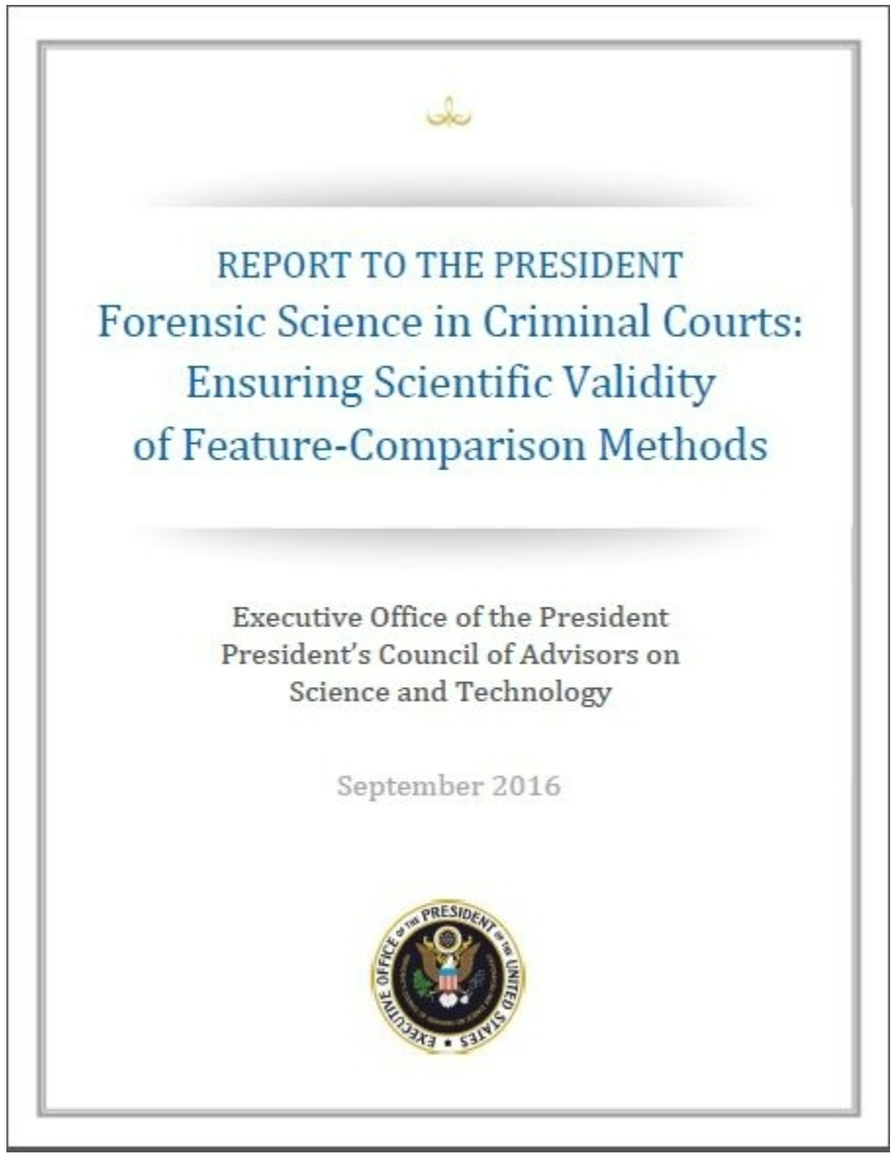
September 2016

Black Box Studies

"[T]he foundational validity of a subjective method can only be established through multiple, appropriately designed black -box studies." (p. 9).

Error rates

- **Black box study validation is required if method is "subjective" (p. 46, 143).**
- **False + rate must be based solely on # of conclusive determinations rather than proportion of all examinations (p. 51-52).**
- **Only the % of FP's that occupy upper bound of 95% UCL should be reported. To even report an accurate lower bound would be an attempt at "obfuscation." (p. 153).**
- **Examiners who took no part in these studies should testify that the black box FP error rate is applicable to the case at hand (p. 56, 66, 112, 147, 150)**



PCAST recommends that the Judicial Conference of the United States, through its Subcommittee on the Federal Rules of Evidence, develop best practices manuals and an Advisory Committee note and the Federal Judicial Center develop educational programs related to procedures for evaluating the scientific validity of forensic feature-comparison methods. (p. 145).

Forensic Science International: Genetics 29 (2017) 126–144

Contents lists available at ScienceDirect

Forensic Science International: Genetics

journal homepage: www.elsevier.com/locate/fsig

Research paper

Internal validation of STRmix™ for the interpretation of single source and mixed DNA profiles

Tamyra R. Moretti[a,*], Rebecca S. Just[a], Susannah C. Kehl[b], Leah E. Willis[a], John S. Buckleton[c,d], Jo-Anne Bright[c], Duncan A. Taylor[e,f], Anthony J. Onorato[a]

[a] DNA Support Unit, Federal Bureau of Investigation Laboratory, 2501 Investigation Parkway, Quantico, VA 22135, USA
[b] Biometrics Analysis Section, Federal Bureau of Investigation Laboratory, 2501 Investigation Parkway, Quantico, VA 22135, USA
[c] Institute of Environmental Science and Research, Private Bag 92021, Auckland 1025, New Zealand
[d] National Institute of Standards and Technology, 100 Bureau Drive, Gaithersburg, MD 20899, USA
[e] Forensic Science South Australia, 21 Divett Place, Adelaide, SA 5000, Australia
[f] School of Biological Sciences, Flinders University, GPO Box 2100 Adelaide, SA, 5001 Australia

- **Online April 5, 2017**
- **300+ Profiles**
- **Single Source-5 Mixed Profiles**
- **Wide Range-Ratios/Templates**

- **800 Known-Contributor Propositions**
- **100 Reference Comparisons to Mixed Forensic Samples**
- **60k Tests-93.4% True Contributors/LR Supported Inclusion**
- **60k Tests-99% Non-Contributors/LRs Supported Exclusion**
- **Fit for Purpose-Interpretation/Stat. Assessment SS-5 Contributors**

Forensic Science International: Genetics 34 (2018) 11–24

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Jo-Anne Bright[a,*], Rebecca Richards[a], Maarten Kruijver[a], Hannah Kelly[a], Catherine McGovern[a], Alan Magee[b], Andrew McWhorter[c], Anne Ciecko[d], Brian Peck[e], Chase Baumgartner[f], Christina Buettner[g], Scott McWilliams[g], Claire McKenna[h], Colin Gallacher[i], Ben Mallinder[i], Darren Wright[j], Deven Johnson[k], Dorothy Catella[l], Eugene Lien[m], Craig O'Connor[m], George Duncan[n], 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

- **Online 1-8-18**
- **2,825 Mixtures**
- **31 Laboratories**
- **3-6 Person Mixtures**

- **Collection of Previously Unpublished Validation Data**
- **Wide Range Kits, Equipment, Proportions, Templates**
- **Established Validity of STRMix Interpret/Statistically Assess Mixtures Well Beyond PCAST 3-Mix/20% POI Limitation**

October 27, 2017
Boston College School of Law
Judicial Conference Advisory Committee on Federal Rules

BOSTON COLLEGE LAW

Amend FRE 702 for Forensic Identification?
Create a New Rule for Forensic Identification?
Draft a Best Practices Manual for Judges on Forensic Identification?

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Forensic Expert Testimony, Daubert, and Rule 702

March 2018 | Vol. 86, No. 4

Fixing Rule 702: The PCAST Report and Steps to Ensure the Reliability of Forensic Feature-Comparison Methods in the Criminal Courts

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The Reliability of the Adversarial System to Assess the Scientific Validity of Forensic Evidence
By Andrew D. Goldsmith
Associate Deputy Attorney General

Federal Rules Advisory Committee Meeting
Thurgood Marshall
Federal Judiciary Building
Washington, D.C.
April 26, 2018

Questions?

FINAL BODE SLIDES

From: "Hunt, Ted (ODAG)" <(b) (6)
To: (b) (6) Ted Hunt
Date: Tue, 03 Apr 2018 23:18:10 -0400
Attachment FINAL Bode 2018 Slide ppt (4 43 MB)

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)

Department of Justice

Update on Forensic Initiatives

Ted R. Hunt

Senior Advisor to the Attorney General on Forensic Science

United States Department of Justice

Focus on 3 Critical Areas

I. Increasing Coordination and Collaboration on Forensic Science

II. Increasing the Capacity of Forensic Service Providers

III. Improving the Validity & Reliability of Forensic Analysis

I. Increasing Coordination and Collaboration on Forensic Science

- Within the Department
- Across the Federal Government
- With State, Local, & Tribal Entities

Appointment
Senior Advisor on Forensic Science

JUSTICE NEWS

Department of Justice

Office of Public Affairs

FOR IMMEDIATE RELEASE

Monday, April 10, 2017

Attorney General Jeff Sessions Announces New Initiatives to Advance Forensic Science and Help Counter the Rise in Violent Crime

As part of the Department's efforts under the Task Force on Crime Reduction and Public Safety (Task Force), Attorney General Jeff Sessions today announced a series of actions the Department will take to advance forensic science and help combat the rise in violent crime.

These actions are being undertaken on the expiration of the National Commission on Forensic Science (NCFS) and will increase the capacity of forensic science providers, improve the reliability of forensic analysis, and permit reporting of forensic results with greater specificity. The Task Force's Subcommittee on Forensics will spearhead the development of that strategic plan.

"The availability of prompt and accurate forensic science analysis to our law enforcement officers and prosecutors is critical to integrity in law enforcement, reducing violent crime and increasing public safety," said Attorney General Sessions. "As we decide how to move forward, we bear in mind that the Department is just one piece of the larger criminal justice system and that the vast majority of forensic science is practiced by state and local forensic laboratories and is used by state and local prosecutors. We applaud the professionalism of the National Commission on Forensic Science and look forward to building on the contributions it has made in this crucial field."

The following three actions were announced today:

1. In the coming weeks, the Department will appoint a Senior Forensic Advisor to interface with forensic science stakeholders and advise Department leadership;

Forensic Science Working Group

- **Department Working Group**
- **Chaired by Senior Advisor on Forensic Science**
- **Department Components Represented**
- **Meet Bi-Monthly**
- **Proactive & Reactive to Emerging Issues**

Council of Federal Forensic Laboratory Directors (CFFLD)

CFFLD

- First established 2005
- Attorney General Alberto Gonzales
- Re-chartered 2018 by DAG Rosenstein
- Announced at AAFS Seattle (February 2018)
- First Meeting: May 21, Atlanta, Georgia at ASCLD

Administration

- Coordinated through the ODAG
- Chaired by a DOJ crime lab director
- Designated by the DAG
- Vice-Chair-non-DOJ voting member

Mission

- Advise federal agencies concerned with formulation & execution of national policies on forensic science

- Forum for consensus building and exchange of information regarding implementation of policies related to forensic science

Scope

- Advise represented federal agencies on issues related to the advancement of forensic science

- Through the DAG, the CFFLD may respond to requests for assistance or provide consensus-based position statements

- Provided to federal agencies of the judicial or legislative branches and to state and local jurisdictions

Topics

- Forensic research
- Application of new/improved technologies or methods
- Quality assurance issues
- Education and training
- Provision of consensus-based position statements to the DAG
- Other represented federal agencies

Mechanism for
Ongoing Communication/Collaboration & Input

State, Local, Tribal Practitioners
(Pending-Stay Tuned)

II. Increasing the Capacity of Forensic Service Providers

Status & Needs Assessment
Forensic Science Community

Justice for All Reauthorization Act 2016

S. 2577

One Hundred Fourteenth Congress
of the
United States of America

AT THE SECOND SESSION

Begun and held at the City of Washington on Monday, the fourth day of January, two thousand and sixteen

An Act

To protect crime victims' rights, to eliminate the substantial backlog of DNA and other forensic evidence samples to improve and expand the forensic science testing capacity of Federal, State, and local crime laboratories, to increase research and development of new testing technologies, to develop new training programs regarding the collection and use of forensic evidence, to provide post-conviction testing of DNA evidence to exonerate the innocent, to support accreditation efforts of forensic science laboratories and medical examiner offices, to address training and equipment needs, to improve the performance of counsel in State capital cases, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

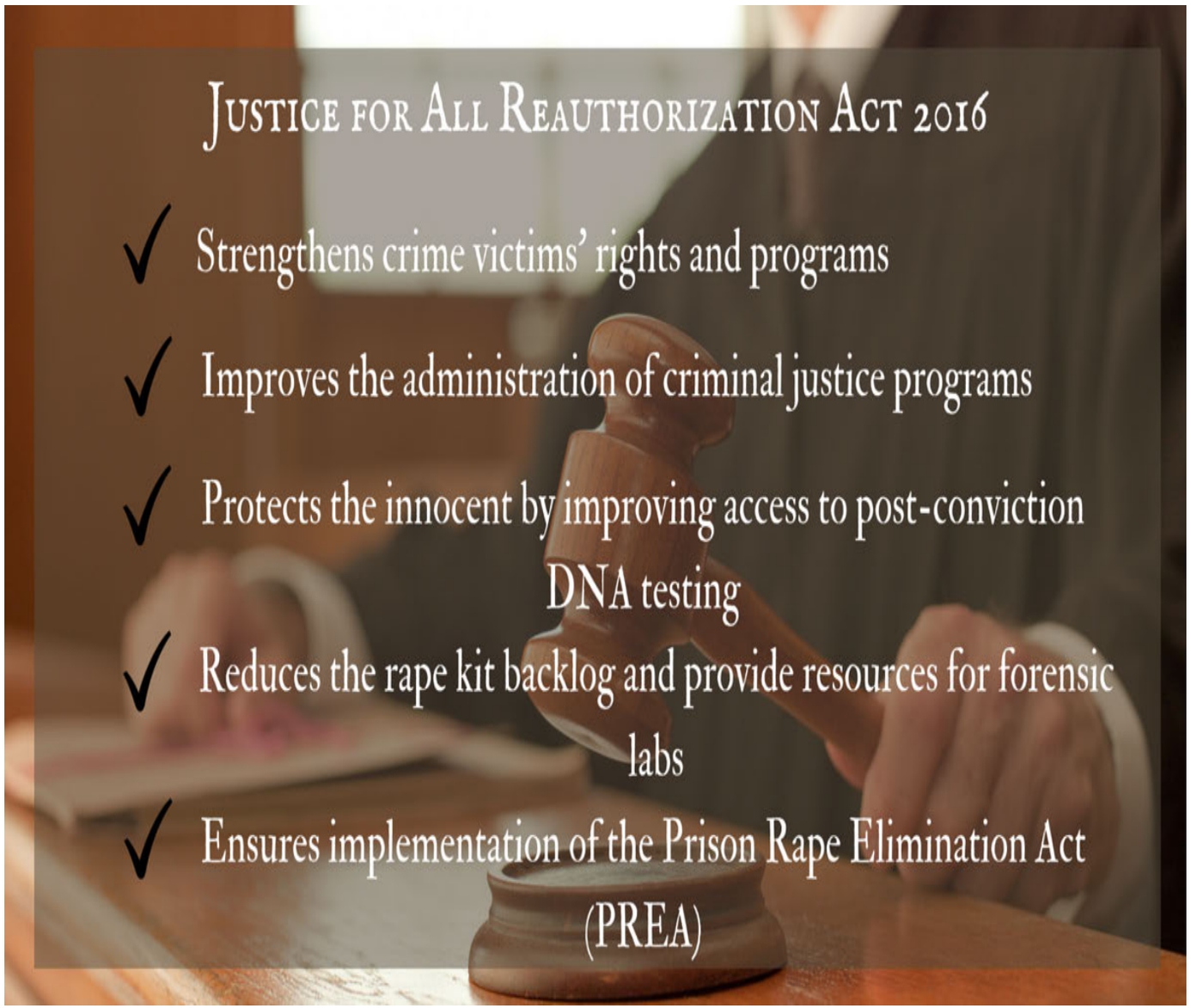
SECTION 1. SHORT TITLE.

This Act may be cited as the "Justice for All Reauthorization Act of 2016".

SEC. 2. CRIME VICTIMS' RIGHTS.

(a) RESTITUTION DURING SUPERVISED RELEASE.—Section 3583(d) of title 18, United States Code, is amended in the first sentence by inserting ", that the defendant make restitution in accordance with sections 3663 and 3663A, or any other statute authorizing a sentence of restitution," after "supervision".

(b) COLLECTION OF RESTITUTION FROM DEFENDANT'S ESTATE.—Section 3613(b) of title 18, United States Code, is amended by adding at the end the following: "The liability to pay restitution shall terminate on the date that is the later of 20 years from the entry of judgment or 20 years after the release from imprisonment of the person ordered to pay restitution. In the event of the death of the person ordered to pay restitution, the individual's



SEC. 16. NEEDS ASSESSMENT OF FORENSIC LABORATORIES

(a) STUDY AND REPORT.—Not later than October 1, 2018, the Attorney General shall **conduct a study** and **submit a report** to the Committee on the Judiciary of the Senate and the Committee on the Judiciary of the House of Representatives on the **status and needs of the forensic science community**.

(b) REQUIREMENTS —The report required under subsection (a) shall—

(1) examine the status of **current workload**, **backlog**, **personnel**, **equipment**, and **equipment needs** of **public crime laboratories** and **medical examiner and coroner** offices;

(2) include an overview of **academic forensic science resources and needs**, from a broad forensic science perspective, including **nontraditional** crime laboratory **disciplines** such as forensic anthropology, forensic entomology, and others as determined appropriate by the Attorney General;

(3) consider—

(A) the National Institute of Justice study, **Forensic Sciences: Review of Status and Needs, published in 1999**;

(B) the **Bureau of Justice Statistics census reports** on Publicly Funded Forensic Crime Laboratories, published in 2002, 2005, 2009, and 2014;

(C) the National Academy of Sciences report, **Strengthening Forensic Science: A Path Forward**, published in 2009; and

(D) the **Bureau of Justice Statistics survey** of forensic providers **recommended by the National Commission of Forensic Science** and approved by the Attorney General on September 8, 2014;

(4) provide Congress with a comprehensive view of the **infrastructure**, **equipment**, and **personnel needs** of the broad **forensic science community**; and

(5) be made **available to the public**.

Listening Sessions

- Forensic Toxicology Community
- IAI
- MDI Community
- ASCLD
- SWGDE
- Attorneys/Judges
- IACP forensic leaders
- FEPAC
- Federal Lab Directors

Rapid DNA Act 2017

H. R. 510

One Hundred Fifteenth Congress
of the
United States of America

AT THE FIRST SESSION

Begun and held at the City of Washington on Tuesday, the third day of January, two thousand and seventeen

An Act

To establish a system for integration of Rapid DNA instruments for use by law enforcement to reduce violent crime and reduce the current DNA analysis backlog.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Rapid DNA Act of 2017".

SEC. 2. RAPID DNA INSTRUMENTS.

(a) STANDARDS.—Section 210303(a) of the DNA Identification Act of 1994 (42 U.S.C. 14131(a)) is amended by adding at the end the following:

"(5)(A) In addition to issuing standards as provided in paragraphs (1) through (4), the Director of the Federal Bureau of Investigation shall issue standards and procedures for the use of Rapid DNA instruments and resulting DNA analyses.

"(B) In this Act, the term 'Rapid DNA instruments' means instrumentation that carries out a fully automated process to derive a DNA analysis from a DNA sample.".

(b) INDEX.—Paragraph (2) of section 210304(b) of the DNA Identification Act of 1994 (42 U.S.C. 14132(b)(2)) is amended to read as follows:

"(2) prepared by—

"(A) laboratories that—

"(i) have been accredited by a nonprofit professional association of persons actively involved in forensic science that is nationally recognized within the forensic science community; and

Statutory Quality Standards (Analysis & Data)

Indices “shall include only information on DNA Identification records and DNA analyses that are **Based on** analyses”

- Performed **by or on behalf of a criminal justice agency** (or Secretary of Defense)
- In accordance with **publically available standards**
- That **satisfy or exceed** the guidelines for a quality assurance program for DNA analysis **[DNA QAS]**
- **Issued by the Director** of the FBI

DNA Identification Act of 1994
42 USC 14132
(Now 34 USC 12592)

Authorized Analysis Entities

Criminal justice agencies

- **Using Rapid DNA instruments approved by the Director of the FBI**

- In **compliance** with the **standards and procedures** issued by the Director **[pending]**

34 USC 12592(2)(b)
Rapid DNA Act of 2017

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Rapid DNA Act of 2017 (September 1, 2017)

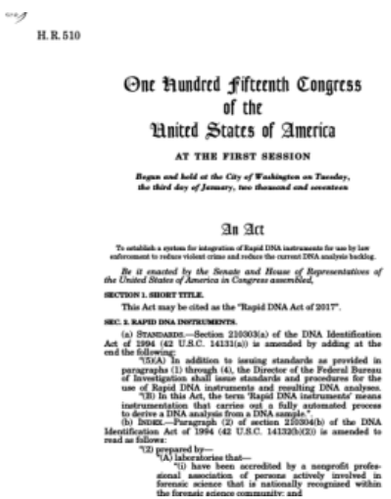
"In this Act, the term 'Rapid DNA instruments' means instrumentation that carries out a **fully automated process** [extraction, amplification, separation, detection, and **interpretation** with no human intervention] to derive a DNA analysis from a DNA sample."

34 USC 12591 (a)(5)(B)

Statutory Quality Standards
(Documentary Standards & Procedures)

"In addition to issuing standards as provided in paragraphs (1) through (4) [DNA QAS], **the Director of the Federal Bureau of Investigation shall issue standards and procedures for the use of Rapid DNA instruments and resulting DNA analyses**."

34 USC 12591 1(A)(5)(A)
Rapid DNA Act of 2017



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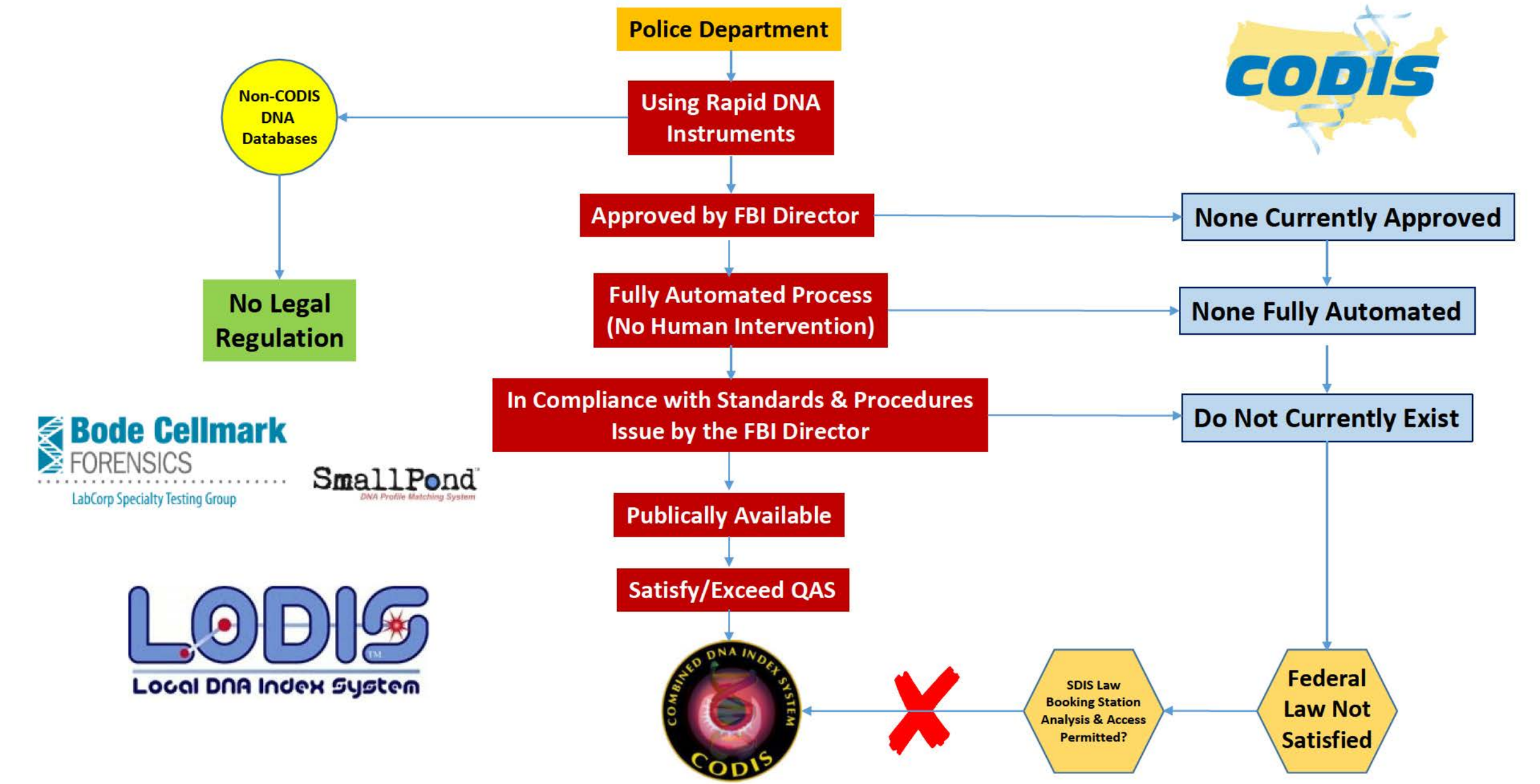
Field Use of Rapid DNA: Statutory Pipeline to CODIS



FBI Rapid DNA Roadmap

2018 Enhanced CODIS Software

- RDIS – 4th Tier of CODIS
- CODIS Rapid Enrollment
- Search-DNA Index of Special Concern (SDIS & NDIS DISC & Subsequent Legacy Searches)

2018 Draft Pilot Plan and Schedule for 2019 Pilots

2018 Draft Authority to Operate Rapid DNA in Booking Stations

2018 Draft Rapid DNA Quality Assurance Standards for Booking Stations

2018 Draft Rapid DNA Procedures for Booking Stations

2019 Rapid Booking Station Pilots (AZ, CA, FL, LA, TX)

Filed 4/2/18

IN THE SUPREME COURT OF CALIFORNIA

THE PEOPLE,

Plaintiff and Respondent,

v.

MARK BUZA,

Defendant and Appellant.

S223698

Ct.App. 1/2 A125542

San Francisco County
Super. Ct. No. SCN 207818

In 2004, California voters passed Proposition 69 (Prop. 69, as approved by voters, Gen. Elec. (Nov. 2, 2004); known as the "DNA Fingerprint, Unsolved Crime and Innocence Protection Act" (DNA Act)) to expand existing requirements for the collection of DNA identification information for law enforcement purposes. The DNA Act requires law enforcement officials to collect DNA

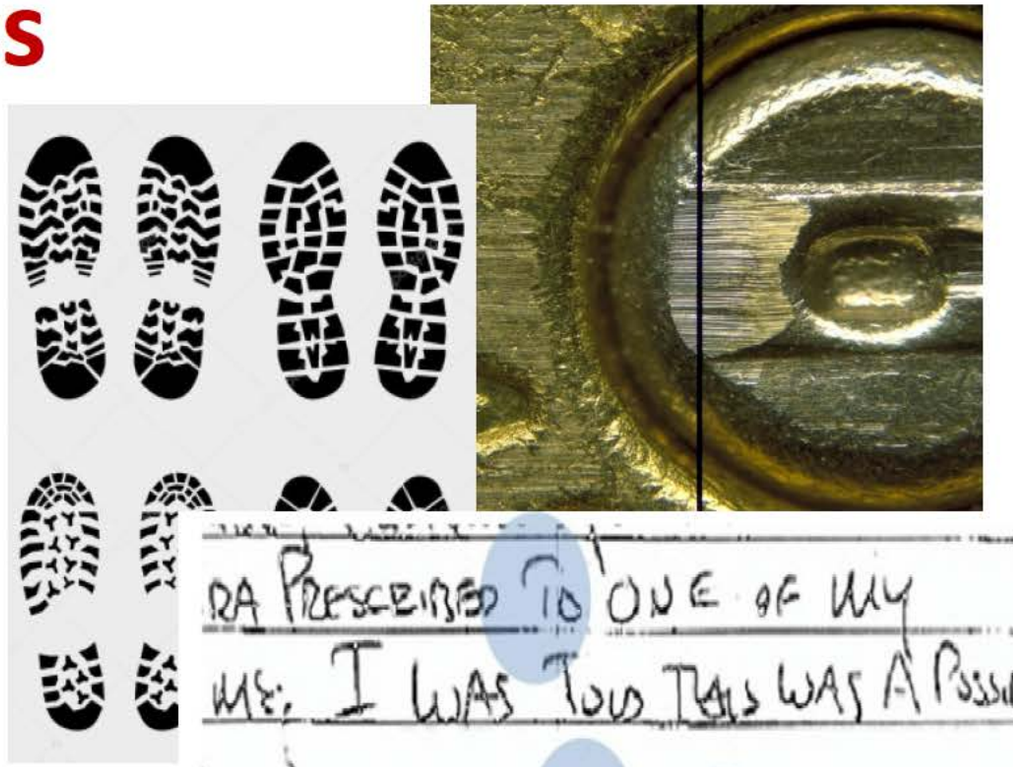
- Decided Monday
- Arrestee DNA Collection
- Cal. Prop. 69 (2004)
- State Constitution Not Violated
- Federal Constitution Not Violated
- Reversed 2014 Cal Ct. App. Decision
- Held Cal. Const. Art 1 Sec 13 Violated

III. Increasing the Validity & Reliability of Forensic Evidence

FBI Decision Threshold Studies

Decision Threshold Studies (Black Box)

- Firearms/Toolmarks
- Shoe Print
- Document Examination



Study Attributes

- Discipline-Wide (Fed, State, Local, Private)
- Large-Scale >100s Examiners; 1,000s Samples; >10,000 Individual Decisions
- Fully Open Set Design
- Biased Hard
- Multi-Year

Uniform Language Testimony and Reports

(ULTRs)

A Quality Assurance Measure to Correctly Convey Significance and Limitations of Expert Conclusions in Understandable Language

- Scientifically/Technically Justified
- Epistemically Bounded
- Probative Value Correctly Formulated & Expressed
- Comprehensible Translation to Finder of Fact

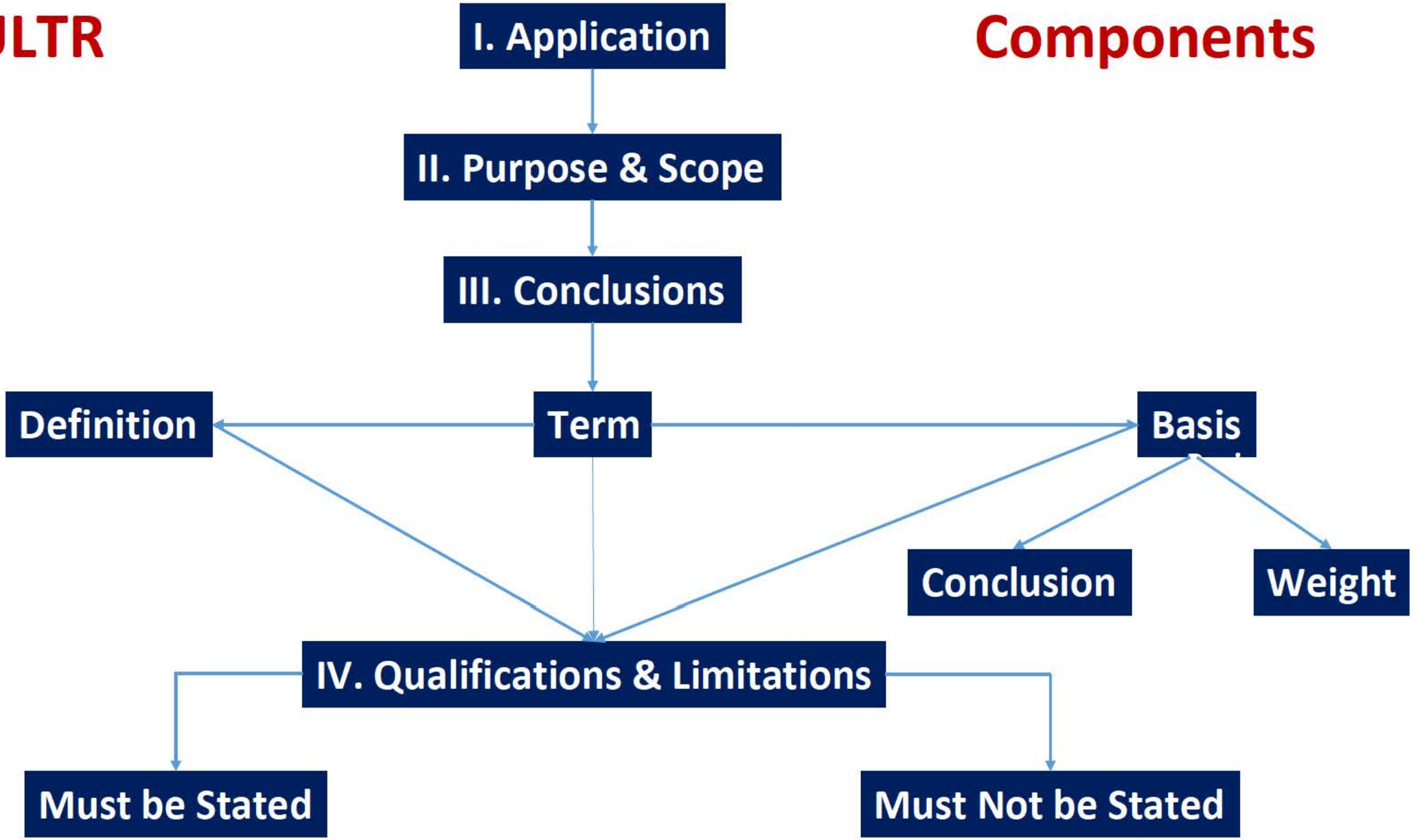
Purpose

- Uniformity of Language in Testimony & Reports
- Consistency Among Department Forensic Examiners
- Consistency Between Forensic Examiners in Same Lab

Consistency Between Same Examiner/Different Testimonies

- Enhanced Quality of Testimony & Reports

ULTR Components



Latent Print ULTR

- Approved
- Announced at AAFS by DAG Rosenstein
- Online at:

https://www.justice.gov/file/1036801/download

- Conclusions are Examiner **Decision-Based**
- Evidence in Support of **Alternative Propositions Evaluated**
- Source Identification = Statement of **Examiner's Belief** (Not Statistically-Derived or Verified Measurement or Comparison)
- Basis of Source Identification = Logical, **Evidence-Based Inductive Inference**

Qualifications/Limitations

- Individualize/Individualization
- 100% Level of Certainty
- Infallible/Zero Error Rate
- Number of LP Exams Not Proxy for Accuracy of Instant Conclusion
- Reasonable Degree of Scientific Certainty Not Stated

Testimony Monitoring Framework

Testimony Monitoring

- Quality Assurance Measure
- Department Laboratories
- Department Digital Analysis Entities

Testimony Monitoring

- Testimonial Statements & Conclusions
- Properly Qualified & Appropriately Communicated
- Ongoing Assessment of Testimonial Presentations
- Highlight Opportunities for Continual Improvement

Evaluation

- **Consistency with mandatory component policies & procedures regarding analysis of forensic evidence**

- **Opinions, conclusions, and statements regarding case-specific facts & data were properly qualified and did not exceed scientific limitations of the method performed or discipline in question**

- **Conclusions were in conformity with any applicable ULTR**

Posting DOJ Laboratory Documents Online

Online Posting

- Quality Management System Documents
- Testing/Analysis/Examination Policies/SOPs
- Validation Study Summaries

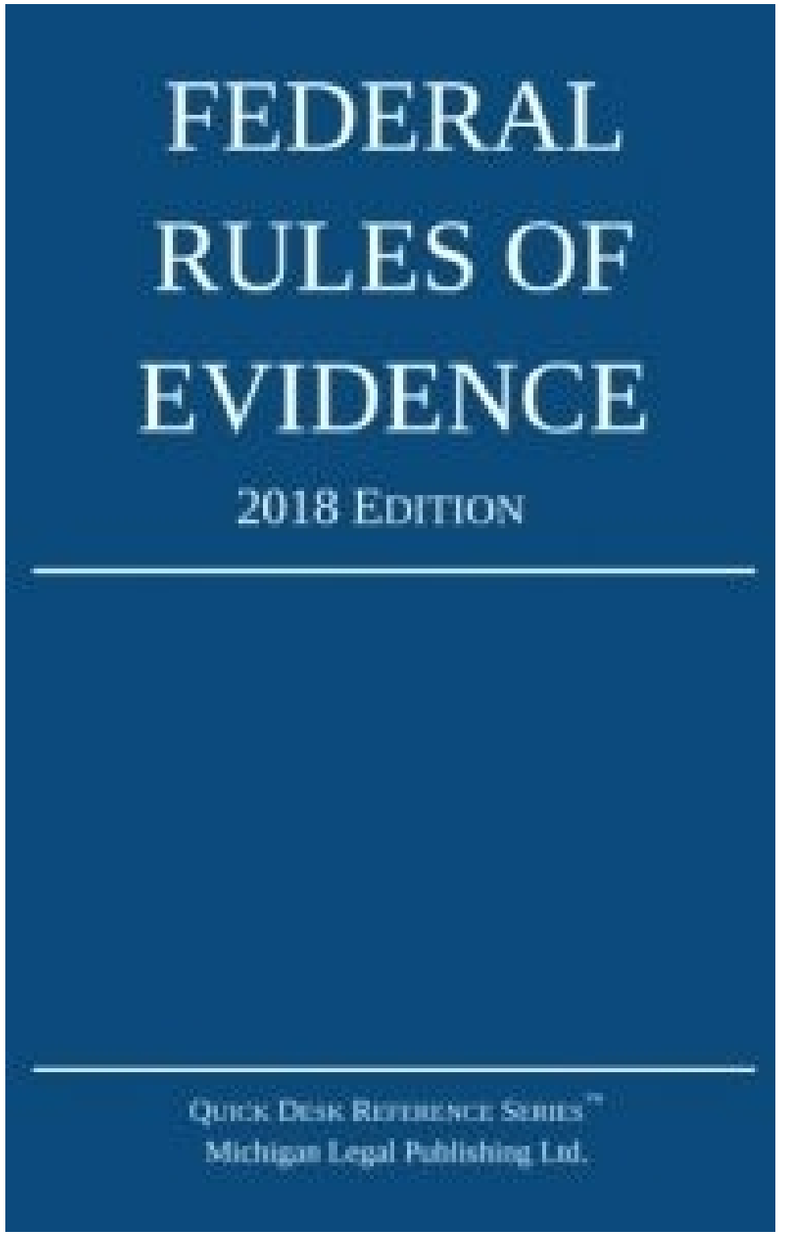
Online Posting

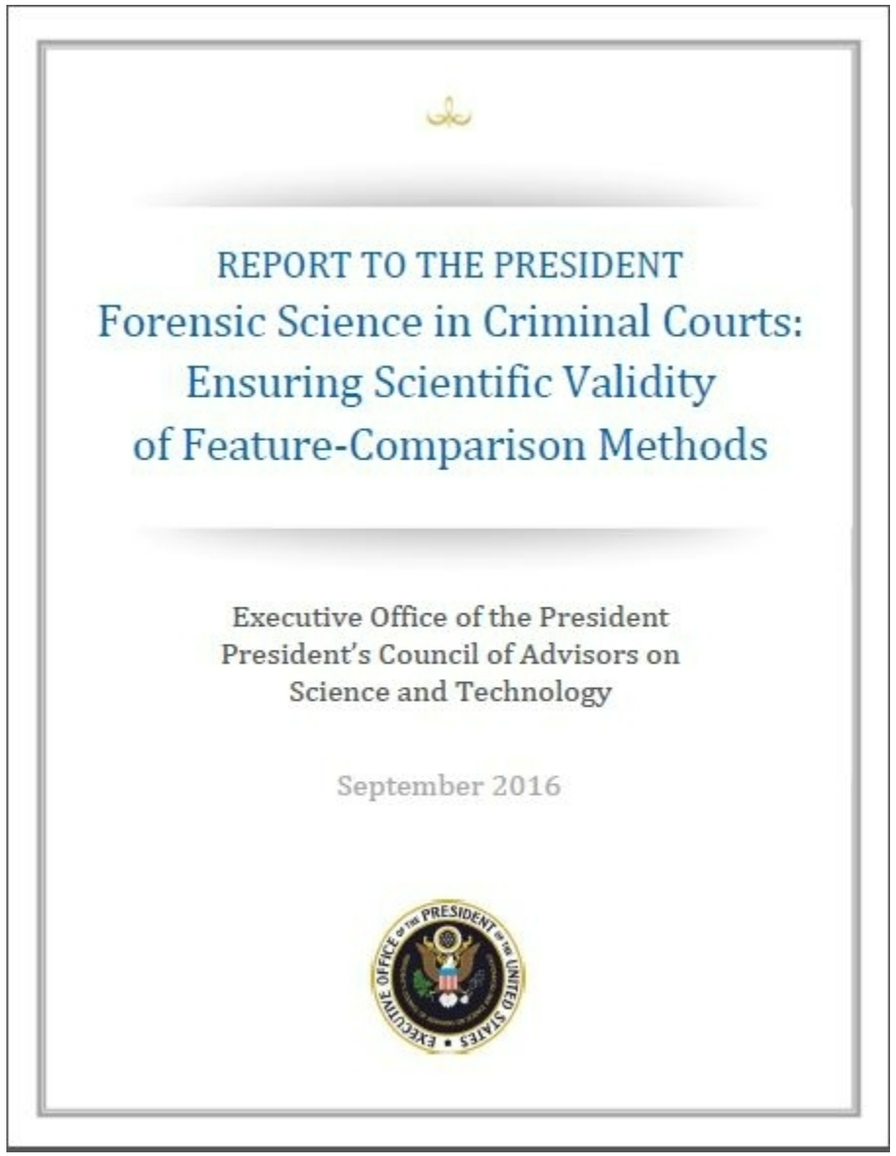
- Each DOJ Laboratory Component
- Current Version of Documents
- Spring 2018

Principles & Utilities

- Transparency (Scientific Values)
- Discovery & Disclosure Efficiencies (Legal Compliance)
- Sharing of High Quality SOPs (Quality Promotion)

The PCAST Report
&
The Attempt to Amend FRE Rule 702 (Expert Testimony)





REPORT TO THE PRESIDENT

Forensic Science in Criminal Courts:
Ensuring Scientific Validity
of Feature-Comparison Methods

Executive Office of the President
President's Council of Advisors on
Science and Technology

September 2016

- DNA Mixtures (Single Source + 2 Contributors)
- DNA Mixtures (Complex-More Than 2 Contributors)
- Bitemark Analysis
- Latent Fingerprint Analysis
- Firearms Analysis
- Footwear Analysis
- Hair Analysis (Partial Consideration)

Forensic Science International: Genetics 29 (2017) 126–144

Contents lists available at ScienceDirect

Forensic Science International: Genetics

journal homepage: www.elsevier.com/locate/fsig

Research paper

Internal validation of STRmix™ for the interpretation of single source and mixed DNA profiles

Tamyra R. Moretti[a,*], Rebecca S. Just[a], Susannah C. Kehl[b], Leah E. Willis[a], John S. Buckleton[c,d], Jo-Anne Bright[c], Duncan A. Taylor[e,f], Anthony J. Onorato[a]

[a] DNA Support Unit, Federal Bureau of Investigation Laboratory, 2501 Investigation Parkway, Quantico, VA 22135, USA
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[d] National Institute of Standards and Technology, 100 Bureau Drive, Gaithersburg, MD 20899, USA
[e] Forensic Science South Australia, 21 Divett Place, Adelaide, SA 5000, Australia
[f] School of Biological Sciences, Flinders University, GPO Box 2100 Adelaide, SA, 5001 Australia

- **FBI STRMix Internal Validation**
- **Online April 5, 2017**
- **300+ Profiles**
- **Single Source-5 Mixed Profiles**
- **Wide Range-Ratios/Templates**

- **800 Known-Contributor Propositions**
- **100 Reference Comparisons to Mixed Forensic Samples**
- **60k Tests-93.4% True Contributors/LR Supported Inclusion**
- **60k Tests-99% Non-Contributors/LRs Supported Exclusion**
- **Fit for Purpose-Interpretation/Stat. Assessment SS-5 Contributors**

Forensic Science International: Genetics 34 (2018) 11–24

Contents lists available at ScienceDirect

Forensic Science International: Genetics

journal homepage: www.elsevier.com/locate/fsigen

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 Ciecko[d], Brian Peck[e], Chase Baumgartner[f], Christina Buettner[g], Scott McWilliams[g], Claire McKenna[h], Colin Gallacher[i], Ben Mallinder[i], Darren Wright[j], Deven Johnson[k], Dorothy Catella[l], Eugene Lien[m], Craig O'Connor[m], George Duncan[n], 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]

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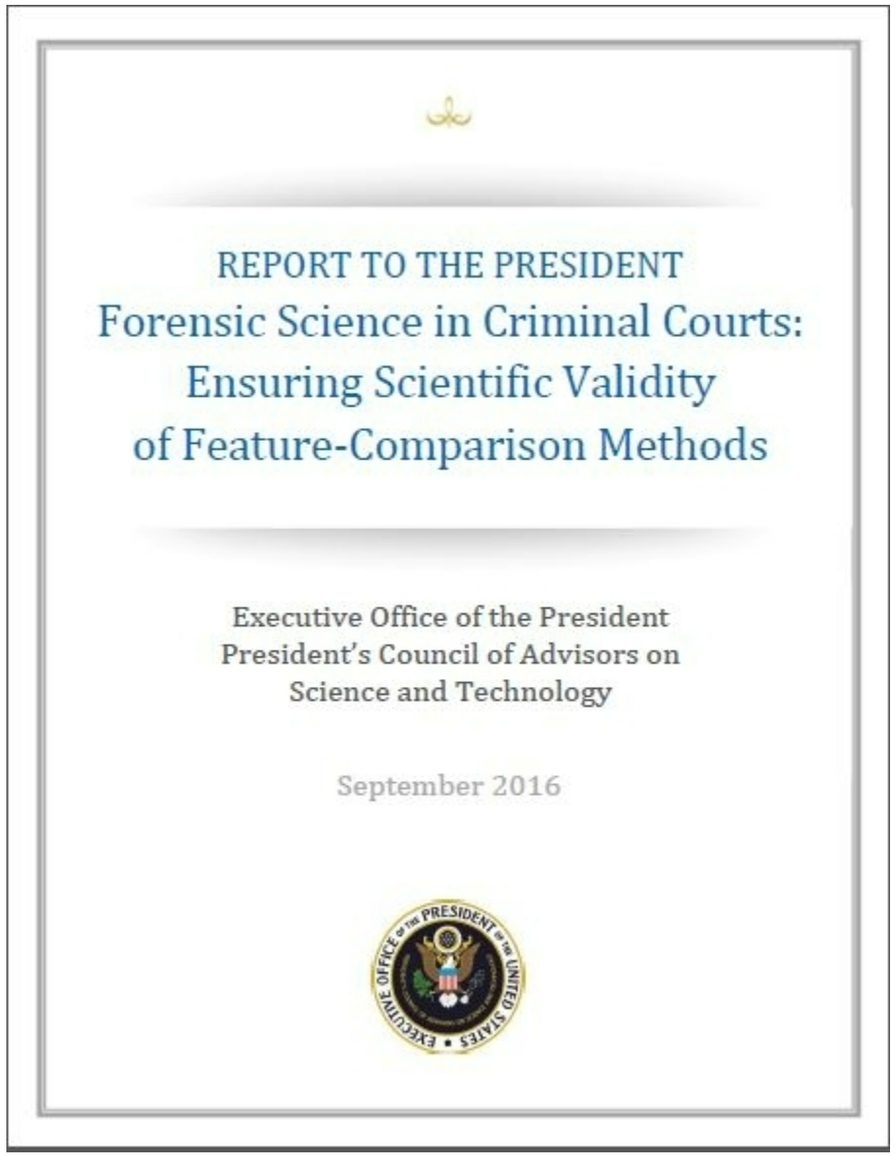
[b] Forensic Science Ireland, Ireland
[c] Texas Department of Public Safety, Houston Laboratory, United States
[d] Midwest Regional Forensic Laboratory, Andover, MN, United States

- **Online 1-8-18**
- **31 Laboratories**
- **2,825 Mixtures**
- **3-6 Person Mixtures**

- **Collection of Previously Unpublished Validation Data**
- **Wide Range Kits, Equipment, Proportions, Templates**
- **Established Validity of STRMix Interpret/Statistically Assess Mixtures Well Beyond PCAST 3-Mix/20% POI Limitation**



Black Box Studies

"[T]he foundational validity of a subjective method can only be established through multiple, appropriately designed black -box studies." (p. 9).

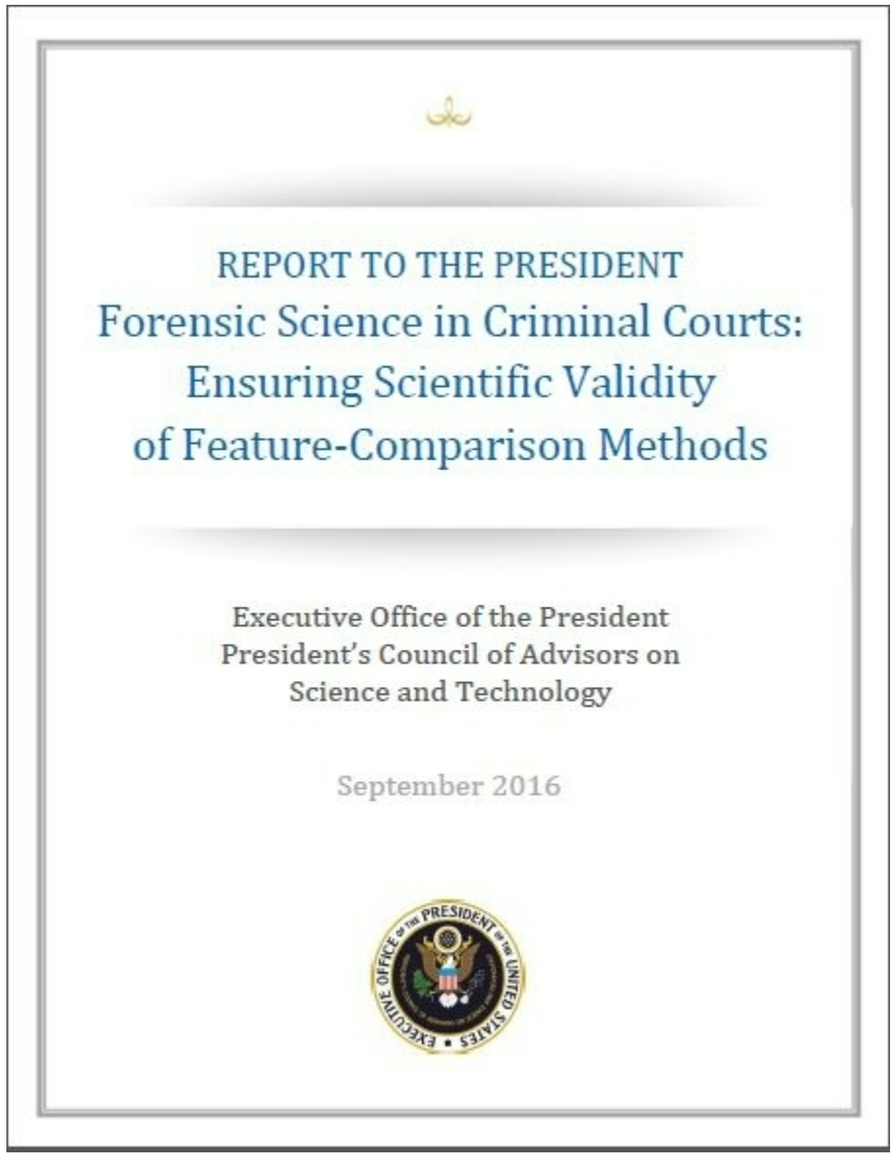
Error rates

▪Black box study validation is required if method is "subjective" (p. 46, 143).

▪False + rate must be based solely on # of conclusive determinations rather than proportion of all examinations (p. 51-52).

▪Only the % of FP's that occupy upper bound of 95% CI should be reported. To even report an accurate lower bound would be an attempt at "obfuscation." (p. 153).

▪Examiners who took no part in these studies should testify that the black box FP error rate is applicable to the case at hand (p. 56, 66, 112, 147, 150)



PCAST recommends that the Judicial Conference of the United States, through its Subcommittee on the Federal Rules of Evidence, develop best practices manuals and an Advisory Committee note and the Federal Judicial Center develop educational programs related to procedures for evaluating the scientific validity of forensic feature-comparison methods. (p. 145).

October 27, 2017
Boston College School of Law
Judicial Conference Advisory Committee on Federal Rules

BOSTON COLLEGE | LAW

Amend FRE 702 for Forensic Identification?
Create a New Rule for Forensic Identification?
Draft a Best Practices Manual for Judges on Forensic Identification?

PANELISTS

Dr. Thomas Albright
Prof. Ronald J. Allen
Susan Ballou
Dr. Itiel Dror
Chris Fabricant, Esq.
Anne Goldbach, Esq.
Andrew Goldsmith, Esq.
Hon. Paul W. Grimm
Zachary Hafer, Esq.
Ted R. Hunt, Esq.
Dr. Alice Isenberg
Dr. Karen Kafadar
Prof. David H. Kaye
Prof. Jonathan J. Koehler
Hon. Alex Kozinski

MODERATOR
Professor Daniel J. Capra
CHAIR OF RULES COMMITTEE
Hon. David Campbell
CHAIR OF ADVISORY COMMITTEE
Hon. Debra A. Livingston
FORMER CHAIR OF ADVISORY COMMITTEE
Hon. William Sessions, III

BOSTON COLLEGE | LAW

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Dr. Eric Lander
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Prof. Jane Campbell Moriarty
Prof. Erin Murphy
Hon. Jed S. Rakoff
Prof. Stephen A. Saltzburg
Dr. Jeff Salyards
Hon. Patti B. Saris
Laura M. Shamp, Esq.
Thomas M. Sobol, Esq.

Forensic Expert Testimony, Daubert, and Rule 702

March 2018 | Vol. 86, No. 4

Fixing Rule 702: The PCAST Report and Steps to Ensure the Reliability of Forensic Feature-Comparison Methods in the Criminal Courts

By Eric S. Lander

Online

Scientific Validity and Error Rates: A Short Response to the PCAST Report
By Ted Robert Hunt
DOJ Senior Advisor on Forensic Science

Scientific Excellence in the Forensic Science Community
By Alice R. Isenberg & Cary T. Oien
DAD FBI Crime Laboratory

The Reliability of the Adversarial System to Assess the Scientific Validity of Forensic Evidence
By Andrew D. Goldsmith
Associate Deputy Attorney General

Federal Rules Advisory Committee Meeting
Thurgood Marshall
Federal Judiciary Building
Washington, D.C.
April 26, 2018

Questions?