



# Office of the Hamilton County Public Defender

## Pre-trial Litigation in DNA Cases: Discovery and Admissibility Challenges

Carrie Wood

Assistant Public Defender

Office of the Hamilton County Public Defender



“Expert evidence can be both powerful and quite misleading because of the difficulty in evaluating it.”

Daubert v. Merrill Dow Pharmaceutical, 509 U.S. 579, 595 (1993)

"A lawyer cannot fully appreciate when he or she needs an expert or what the expert has to say, nor can the lawyer properly cross-examine opposing experts or prepare for trial, if the lawyer lacks even the most elementary knowledge of how forensic sciences work."

Convicting the Guilty, Acquitting the Innocent: The ABA Takes a Stand, by Andrew e. Taslitz, Criminal Justice, Winter 2005 p. 29-30.



# Where to Start?



I cannot see the answer to your question. You'll need to file that discovery request after all.



# How do I obtain the discovery I need?

- Informal Letter or Request
- Discovery Statute
- Motion to Compel
- *Brady-Due Process* Litigation
- Sixth Amendment Litigation
- Subpoena
- Interviews with Experts
- Freedom of Information Act Request (or state equivalent)
- Online sources/libraries



What do I ask for?





# Everything\*

\*some things you will  
get easier than  
others

# Discovery-Case File I

Report

Laboratory Case File

Report

Bench Notes

Photos/Diagram

Basis of Opinion

Limitations and assumptions

Studies

Experience and Training

All Correspondence, including all  
Emails

Chain of Custody Documents

Crime Scene Photographs



# ABA Recommendation - Report

The report should be sufficiently comprehensive so that an independent expert can identify the process used and the conclusions reached.

Specifically, the report should include:

- (i) what was tested,
  - (ii) who conducted the testing,
  - (iii) **identification of the protocol used in the testing** and any deviation from the protocol,
  - (iv) **the data and results** produced by the testing or data interpretation,
  - (v) the examiner's interpretation of the results and conclusions therefrom,
  - (vi) **the method and results of any statistical computation**, and
  - (vii) **any additional information that could bear on the validity of the test results, interpretation or opinion.**
- (c) A separate section of the report should explain the test results, interpretation and opinion in language comprehensible to a layperson.





**MIKE DEWINE**  
\* OHIO ATTORNEY GENERAL \*

**Bureau of Criminal Investigation**

**Laboratory Report  
Supplemental**

To: Sheriff's Office BCI Laboratory Number  
Sgt. Columbus, OH 43215 Date: 31, 2014  
Agency 015  
Offense: Rape  
Subject(s): Joseph  
Victim(s): Katelynn

**Submitted on June 05, 2013 by Marjorie**

- 1. Rape kit from Katelynn  
1.7 DNA standard from Katelynn
- 2. Brown paper bag containing

**Submitted on June 12, 2013 by**

- 3. Brown paper bag containing  
3.1 Cuttings from tampon string (presumptive)  
4. Brown paper bag containing clothing to Katelynn - presumptive  
positive for blood June 14, 2013  
4.1 Swabbing from



**Results**

DNA profiling was performed using the polymerase chain reaction at the short tandem repeat loci D8S1179, D21S11, D7S820, CSF1PO, D3S1358, TH01, D13S317, D16S539, D2S1338, D19S433, vWA, TPOX, D18S51, Amelogenin, D5S818, and FGA on samples from Items 3 and 4 and compared to previously analyzed samples from Items 1 and 2 (see report dated June 27, 2013).

The DNA profile from the tampon string (Item 3.1) is consistent with Katelynn

The DNA profile from the interior of the bra (Item 4.1) is a mixture consistent with contributions from Katelynn and at least two unknown individuals, at least one of which is male. Due to the complexity of the mixture, no conclusions can be made regarding Joseph as a possible minor contributor.

Please address inquiries to the office indicated, using the BCI case number.

BCI -Bowling Green Office  
1616 E. Wooster St.-18  
Bowling Green, OH 43402  
Phone:(419)353-5603

BCI -London Office  
1560 St Rt 56 SW P.O. Box 365  
London, OH 43140  
Phone:(740)845-2000

BCI -Richfield Office  
4055 Highlander Pkwy. Suite A  
Richfield, OH 44286  
Phone:(330)659-4600

# You Represent Joseph

Due to insufficient data, the partial Y-chromosome DNA profiles from the vaginal swabs (Item 1.2) and the anal swabs (Item 1.4) are not suitable for comparison purposes.

The Y-chromosome DNA profile from the underwear (Item 1.6) is consistent with Joseph [REDACTED]. Additional peaks were detected at two locations. Due to insufficient data, no conclusions can be made regarding the source of these peaks.

## Y-STR Conclusions and Statistical Information

Neither Joseph [REDACTED] nor any of his paternal male relatives can be eliminated as the source of the major Y-chromosome DNA profile from the underwear (Item 1.6). According to the US Y-STR Database ([www.usystrdatabase.org](http://www.usystrdatabase.org), Release: 3.1, Updated 02/02/2013), the estimated frequency of this profile is 1 in every 3,333 male individuals.

Item 1.6



# Serology Results Can Be More Damning than DNA

AP strong (+)

14-40482 Item 2 AG 10/8/14

Findings/Procedure AL St/crotch area - inside much brighter, and 1 area back p  
AP st (+) inside crotch via map - took cutting\* - SS: +4T APC  
took ~1cm<sup>2</sup> cutting\* around SS cutting + extract → tube 2.1 retained

Samples Retained 2.1 Resealed ct

Ohio BCI Laboratory  
LF-FB-Mideo Speed Notes  
Revision 1  
Issuing Authority: Technical Leader  
Effective Date: 4/20/2012  
Document Page 1 of 1

\*cuttings taken from inside layer of crotch

\*\*did not label wpb w/ case number, item number



# Evidence Examination

Case Number \_\_\_\_\_

Initials DR

Page 3

Item 1.6

Date \_\_\_\_\_

## Item 1.6 DR



# Pre-trial Motions

- Interview the analyst that performed serology testing (transcripts, protocols, etc.).
- Motion in Limine:
  - Unacceptable Language: AP+ does not mean sperm
  - Limits of tests – limits what State can say they mean
- *Daubert/Frye*:
  - If your analyst stretches meaning of results, *Frye/Daubert* can be the vehicle (BEWARE: State v. Jacoby, 170 A.3d 1065 (2017)).
  - Time of Deposit of Sperm



**1332 Internal Vaginal Swabs with Sperm Heads Only  
and Swabs with at Least one Sperm with Tail  
as a Function of Post Coital Interval.  
[Willott & Allard, 1982]**

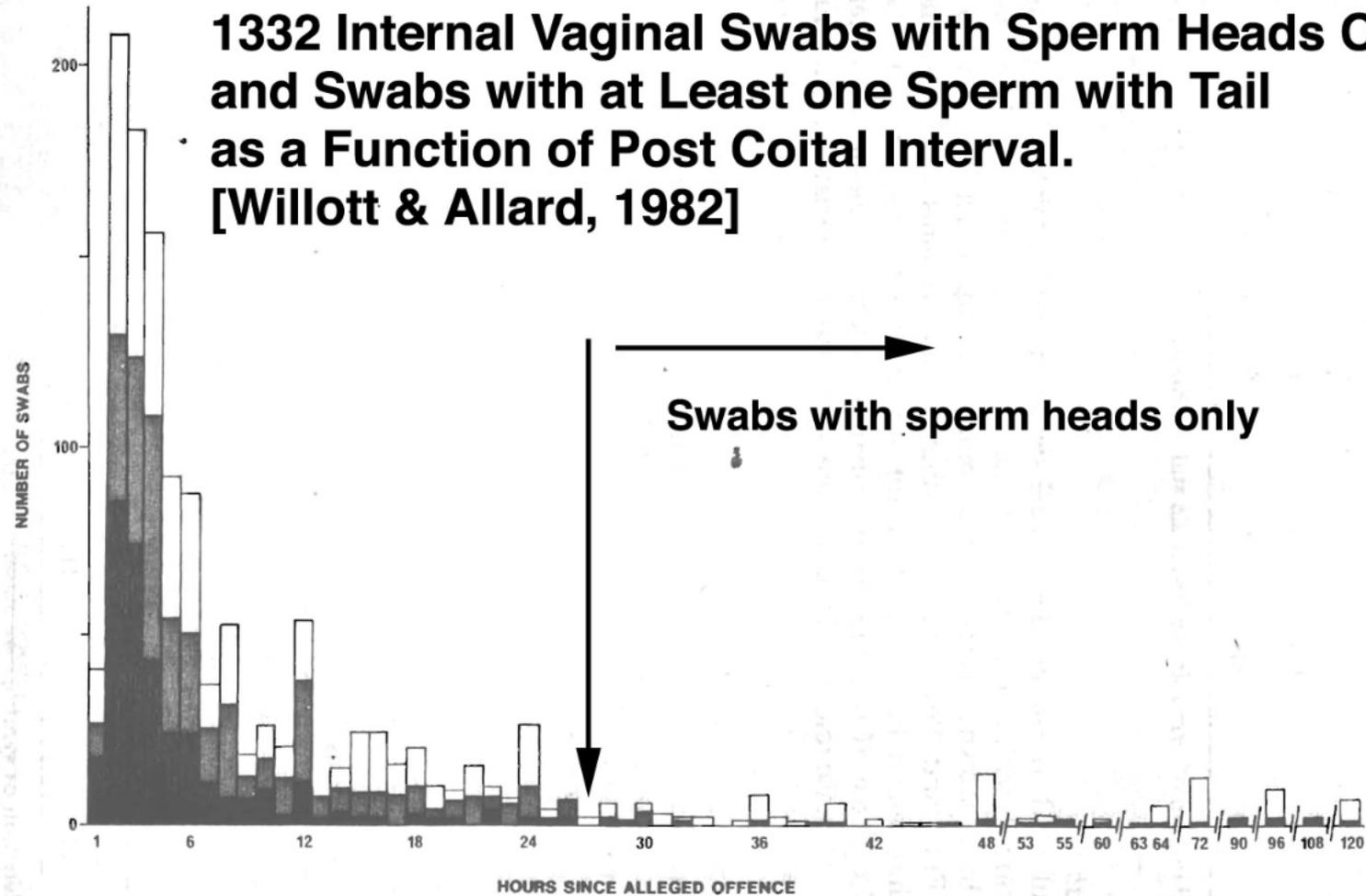


Fig. 12. Occurrence of spermatozoa on external vaginal swabs. ■ sperm heads, ■ spermatozoa with tails, □ no spermatozoa. Figure 12 has been transposed with Figure 6 in the original. Figure 12 contains the data for internal vaginal swabs, whereas Figure 6 contains the data for external vaginal swabs.

# Frye and New Challenges to Old Issues

- Restricted to “novel” scientific evidence? Is it already settled?
  - Legal precedent is not scientific precedent
  - Focus on 702 foundational evidentiary objection to reliability of the opinion
  - Without error rate opinion more prejudicial than probative

# *Daubert, Kumho - 1*

- *Daubert* - 5 Factors
  - Technique testable and tested
  - Peer review
  - *Known or potential error rate of method*
  - Existence of standards controlling technique's operation
    - Scientists define standards for scientific validation
  - General acceptance

# Daubert, Kumho - 2

- *Kumho Tire v. Carmichael*, 526 US 137 (1999)
- Is non-scientific “technical” knowledge of experts based on “experience” reliable for “the task at hand?”
  - Held, *Daubert* factors should be reviewed where “they are reasonable measures of the reliability of the expert testimony,” *Id.*, at 152.
  - “...some of Daubert’s questions can help evaluate the reliability even of experienced based testimony. It would be appropriate for the trial judge to ask, for example, *how often an engineering expert’s experience based methodology has produced erroneous results...*” *Id.*, at 151(emphasis added)
  - Empirical basis for error rates crucial.
  - Great latitude on ultimate reliability determination and how it is determined, *Id.*, at 142, citing *General Electric v. Joiner*, 522 US 136, 143 (1997)



# Overcoming “work product” objections

State laws preclude production of “work product”

“A writing that reflects an attorney’s impressions, conclusions, opinions, or legal research or theories.”

Privilege cannot be used as a per se bar to files.

Hickman v. Taylor, 329 U.S. 495, 508 (1947) (ordinary requests for “relevant, non-privileged facts” are discoverable).

Biasing/Brady information, including attorney “impressions”, e.g., prejudice toward client, transmitted to or from prosecutors, is discoverable



# The Narrative



**Mike DeWine**  
Ohio Attorney General

Bureau of Criminal Identification and  
Investigation  
Office... 330.659.4600  
Fax.....330.659.0681

4055 Highlander Parkway  
Richfield, OH 44286

Comments: Taylor Remembered a male at Mario's and has  
dreamt of the same male. Taylor does not know his  
name. Male described as Bald with a very large  
nose, sunken in eyes, and very high cheek bones.  
He drank wine all night. Taylor says he was either  
Albanian or Croation descent.

- o [redacted] typically when a profile is in CODIS, it fits against some other standard with low probability.
- Profile taken from victim's underwear has not had a low probability hit yet, possibly suggesting it is unique.
- o INTERPOL's database does include [redacted] per S/A [redacted]
- S/A [redacted] reported that upon attempting to interview [redacted] on 3/21/11, they found out she had recently moved to [redacted]
- o Was scheduled to interview [redacted], who is [redacted]

# Discovery-Case File II

Electronic Data

Quantification

Injection Times

Number of runs

Montage clean-up

Serology

Electropherograms

Low Peak Heights

Imbalance of Paired Peaks

Missing Peaks

Peaks that Do Not Match

Use of Probabilistic Genotyping  
Software



# Quantitation

**File:** 053012\_ttp\_ss.sds  
**Print Date:** Tuesday, June 19, 2012 14:23:39  
**User:** EJimenez  
**Plate Type:** Absolute Quantification  
**PCR Volume:** 25 µL

## Document Information

**Operator:** ABIDNA  
**Run Date:** Wednesday, May 30, 2012 07:33:12  
**Last Modified:** Thursday, May 31, 2012 11:14:26  
**Instrument Type:** Applied Biosystems 7500 Real-Time PCR System

Well	Sample Name	Detector	Ct	Qty
A3	97-35366_111.2	Duo Human	33.76	2.79e-002
		Duo Male	Undet.	
		Duo IPC	29.93	
B3	97-35366_111.3	Duo Human	33.62	3.09e-002
		Duo Male	Undet.	
		Duo IPC	29.81	
C3	97-35366_114.1	Duo Human	38.24	1.13e-003
		Duo Male	Undet.	
		Duo IPC	29.88	
D3	97-35366_114.2	Duo Human	29.41	6.30e-001
		Duo Male	Undet.	
		Duo IPC	29.84	
E3	97-35366_114.3	Duo Human	35.06	1.10e-002
		Duo Male	Undet.	
		Duo IPC	29.95	
F3	97-35366_114.4	Duo Human	37.13	2.50e-003
		Duo Male	Undet.	
		Duo IPC	29.86	
G3	MB1_052912_ss	Duo Human	Undet.	
		Duo Male	Undet.	
		Duo IPC	29.83	



23 A. Okay. A human cell contains approximately  
24 6.5 picograms of DNA, which is .0065  
25 nanograms. So the .023 number would be  
1 equivalent to approximately four cells.

2 Q. Because you take .023 over one nanogram is  
3 proportionate to what, .0065 to the number  
4 of cells, it's almost like an equation?

5 A. Yes.

6 Q. Okay. Where X is under the .0065 and when  
7 you do the math or you do the  
8 multiplication, you get .034, so it's  
9 three to four cells?



# Pushing the envelope: Increased Sensitivity in DNA Testing

- When DNA was established as the “gold standard”, the testing required several nanograms of DNA to get results.
- 6pg per cell; ~160 cells per nanogram
- Current tests can develop full profile from 125pg and nearly-full profile from 62pg (~10 cells)
- Increased sensitivity opens the door to “touch” DNA testing  
[INSERT FIG FROM BUTLER – AMT OF DNA IN DIFFERENT SOURCES, incl shedding]



# What does this mean? (i.e. what is the relevance)

- Transfer – what kind (direct or indirect)?
- Frequency – how many times was the object touched?
- How long was the touch?
- When was the last touch?
- Direct transfer without touching?

# Modes of Transfer

Direct/primary transfer: transfer of biological material via direct contact or otherwise without an intermediary (e.g. via sneezing)

Indirect transfer: transfer via an intermediary

Secondary transfer – transfer of biological material via 1 intermediary (e.g. gun found on laying on client's stuff)

Tertiary transfer – transfer of biological material via 2 intermediaries

Quaternary transfer...

# Problems with Linking Amount of DNA with How It Got There

Direct transfer without touching: “Full DNA profiles can be recovered from items that have not been touched, but have been in the vicinity of someone speaking or coughing”

Frequency of touch: “It is not possible to establish from the amount of DNA recovered from a surface whether the DNA was deposited there by a single touch or by regular use”

# Problems with Linking Amount of DNA with How It Got There

Direct versus indirect transfer: "It is not possible to use the amount of DNA recovered from an item of interest to inform whether the DNA was deposited by direct contact or indirect transfer"; "it is impossible to know from the quality of a DNA profile obtained whether the DNA was deposited by direct contact or indirect transfer"

\*\*Meakin and Jamieson (2013)\*\*



# Problems with Linking Amount of DNA with How It Got There

Last touch: “When an item is handled by several individuals, the strongest profile (the one of best quality) is not always the last handler”

Length of touch: “The published data actually suggests length of contact is not a significant factor. Similar amounts of DNA were recovered from a handled object, regardless of the length of time it was held”



# Problems with Linking Amount of DNA with How It Got There

Most likely mode of transfer: Discussing a paper by Goray et al that tested defense hypothesis (defendant handled kid's toys, and his DNA was transferred to wife's PJ via toys): "the authors found that the resultant transfer rates were generally 2-4 times greater than [] expected . . . . In most instances, the major DNA profile observed was that from the 'defendant'. . . . These data demonstrate the difficulty in using the previously derived transfer rates for predicting the transfer of DNA in casework scenarios. . . . There is currently insufficient data for forensic practitioners to opine reliably on which, if any, is the most likely mode of DNA transfer in any particular case"





Bush,<sup>1</sup> Ph.D.

## TECHNICAL CRIMINALIS

Cynthia M. Cale,

## Could Sec Someone

...ing minor profile resulting from secondary DNA transfer was not observed in this sample set. The results obtained from this study illustrate the risk the expert testifying on the DNA results runs by referring to the samples as "touch" DNA or "wearer" DNA. Such terminology implies the source of the DNA profile has to come into direct contact with an object to leave his/her DNA on the object. The demonstrated possibility of secondary DNA transfer could have major ramifications in a forensic investigation; secondary DNA transfer should not be regarded as an event that may only occur under optimal experimental conditions.

In summary, DNA typing results were obtained from 20 of 24 knife samples. The texture of the knife handle did not appear to have a significant effect on the results. Two profiles were clearly from a single source while eighteen were profiles from more than one source. In most instances, the DNA profiles obtained were attributable to the individuals associated with the samples. Alleles foreign to the two known contributors were observed in five samples; the source of these foreign alleles could not be identified. Secondary DNA transfer (i.e., alleles attributable to the individual that did not touch the knife) was detected in 16 instances. In three of the profiles that exhibited secondary DNA transfer, the DNA profile of the secondary contributor was sufficient to affect the interpretation of the results. In five samples, the DNA profile resulting from secondary transfer was suitable for statistical analysis; these profiles had the potential to falsely link an individual to an item of evidence.

**ABSTRACT:** The secondary has not been template/low-quality DNA transfer profile with detectable amount indicated that secondary contributor or the major that DNA recovered

... through an interesting results from low-interpretability secondary findings of the knives DNA typing results either the only contributor the risk of assuming



Cale et al. [1] published on journal of Forensic Sciences the results of a study on secondary transfer of DNA that raised concern on the possibility of an individual depositing non-self DNA on a touched object and him or her being a minor contributor, or not at all a contributor, to the profile obtained from such object. In this study 12 pairs of participants were asked to rinse their hands with water and wear latex gloves for 1.5 hours. Upon removing the gloves participants vigorously and uninterruptedly shook hands for two minutes. Immediately after shaking hands each of the 24 participants handled a previously cleaned knife for two minutes. Each knife was then swabbed and tested for DNA. In five of the 24 samples tested the person that did not handle the knife was the major or sole contributor. These results may be used to suggest that the major or sole contributor to a DNA profile may not be the person that actually touched the object but rather that the DNA has been deposited by secondary transfer.

When considering the experimental design of this study it is obvious that it is biased towards DNA transfer and that it does not mimic common human interactions. The authors themselves state that the experiment was designed to mimic intimate contact and that shaking hands for two minutes does not usually occur under normal circumstances. Furthermore the amount of transferrable DNA on the hands of the participants was likely to be greater than normal given that they had been wearing latex gloves for 1.5 hours. Latex gloves are airtight and tend to increase sweating of the hands and are not normally worn by individuals unless performing specific tasks.

Furthermore this paper induced other scientists, who focus their research efforts on understanding DNA transfer, to send letters to the editors of Journal of Forensic Sciences [2,3], commenting on the experimental design and on the conclusions drawn by Cale et al. Of particular interest are the comments by van Oorshot's group [2], considered the 'father of touch DNA' as he was the first on to have published on this topic in 1997 and has worked on this issue ever since [4]. They state: "It is our concern that the methodology employed substantially overestimates the true rate of DNA transfer, and thus, the conclusions drawn and commentary made about the study are not an accurate reflection of such occurrences in casework situations."

More specifically when referring to the fact that the major contributor is not the person that touched the knife they state. "Such inversions, seen in 25% (5 of 25) of samples within Cale et al., have only been observed at similarly high rates in one other study, that by Lowe et al. [5]. As with the study by Cale et al., the secondary transfer samples examined by Lowe et al. [5], from simulations where DNA was transferred from hand to hand to object, were also unrealistically maximized, in that the experimental design was biased toward transfer, and the subsequent detection of transferred DNA. Other studies examining the transfer of "touch" DNA in less controlled scenarios, considered more realistic examples of secondary transfer rates, have observed the transferred DNA as the major or only component to the profile on far fewer occasions, if at all: ~2.8% in studies where the source of the transferred DNA was known [6– 9]; ~1.4% in studies where the source of the transferred DNA was unknown [10,11]." And finally they conclude that "it is important that transfer probabilities are estimated using realistic scenarios if inferences are to be drawn for casework."

A variety of DNA profiles was obtained during this research project (Table 2). DNA typing results indicated that secondary DNA transfer occurred in 17 of the 20 knife samples (85%) amplified as verified by the presence of alleles consistent with the secondary contributors' DNA profiles. Secondary DNA transfer was not detected in smooth-handled knife samples A and K or in rough-handled knife sample V.

In smooth-handled knife samples C, E, F, and J; and rough-handled knife sample N, alleles from both the primary and secondary contributors were detected; however, the presence of extraneous DNA complicated the interpretation of the DNA profiles. In all five samples, foreign alleles not consistent with either the primary or secondary contributor were identified. For example, a greater than two person mixture with major and minor components was obtained from knife C. The major component was an unknown DNA profile while the minor component was consistent with the DNA profiles of the primary and secondary contributors. The unknown DNA profile was compared to the DNA profiles of all participants and laboratory personnel. The source of the major component could not be identified. As swab-

It is an accepted truth that an initially deposited amount of DNA will be lost with each transfer step in a chain and a seemingly logical extension might suggest that most of the DNA we detect is from primary transfer events. This thinking however, does not take into account the number of potential pathways for these transfers to occur. It is in fact transposing evidence and proposition as we show below. An example encountered by the authors during court testimony involved a defendant who yielded an inclusionary LR when compared to a DNA profile obtained from a swab of the trigger of a gun that was found in amongst clothing on a couch. A single primary transfer, hand to gun, was suggested by the prosecutor as the mode of transfer of the DNA. However, there are a myriad of secondary transfer pathways that exist, which would need to be considered in answering this assertion:

- Hand to bag, bag to gun.
- Body to clothes, clothes to gun.
- Body to couch, couch to gun.
- Defendant hand to offender hand, offender hand to gun, etc.

If considering tertiary transfer events then an even greater number of pathways exist, and this will be counterbalanced with a lower probability of detecting DNA from a tertiary transfer event. The combination of these two competing factors makes estimations about the likely number of transfer events a DNA result has originated from in real life situations extremely difficult.

In formulaic nomenclature we accept that obtaining the DNA profile (DNA):

$$\Pr(\text{DNA}|\text{primary transfer}) > \Pr(\text{DNA}|\text{secondary transfer})$$

For a single transfer event, however given the number of opportunities for higher order transfers to occur it is likely that:

$$\Pr(\text{secondary transfer}) > \Pr(\text{primary transfer})^1$$

# Pre-trial responses

- Transfer: Theory of the case???
- Motion in Limine
  - Preclude use of “touch” or “wearer” DNA by expert and prosecutor: Trace; BFF acknowledges that further work is required to improve evaluation of mode of transfer of DNA evidence (equivalent of using “match” when the result is “cannot be excluded”); People v. Wright, 25 N.Y.3d 769 (2015); People v. Jones, 134 A.D.3d 1588 (4th Dep’t 2015); People v. Rozier, 143 A.D.3d 1258 (4th Dep’t 2016).
- *Daubert/Frye*:
  - Reliability challenge: causes problems with analysis and interpretation with small amounts of DNA
  - Is there a consensus in the community on transfer???
- Cross-examination



# Analyst's Conclusions and State's Use of Unreported Information

## **STR Results**

DNA profiling was performed using the polymerase chain reaction at the short tandem repeat loci D8S1179, D21S11, D7S820, CSF1PO, D3S1358, TH01, D13S317, D16S539, D2S1338, D19S433, vWA, TPOX, D18S51, Amelogenin, D5S818, and FGA on a sample from Item 1.4 and compared to a previously analyzed sample from Item 1.8 (see report dated May 15, 2014).

No DNA profile was obtained from the perianal swabs (Item 1.4).

## **Y-STR Results**

DNA profiling was performed using the polymerase chain reaction at the male-specific short tandem repeat loci DYS456, DYS389I, DYS390, DYS389II, DYS458, DYS19, DYS385a/b, DYS393, DYS391, DYS439, DYS635, DYS392, Y\_GATA\_H4, DYS437, DYS438, and DYS448 on a sample from Item 1.4.

No Y-chromosome DNA profile was obtained from the perianal swabs (Item 1.4).



# Discovery-Case File II

Electronic Data

Quantification

Injection Times

Number of runs

Montage clean-up

Serology

Electropherograms

Low Peak Heights

Imbalance of Paired Peaks

Missing Peaks

Peaks that Do Not Match

Use of Probabilistic Genotyping  
Software



# Discovery III

- Internal and External Validation Studies
- Data Generated from Validation
- Standard Operating Procedures
  - Analytical and Stochastic Threshold
- Audit Reports (CARs)
- Logs of Unexpected Results
- Corrective Action logs
- Proficiency Tests



# And all interpretation of data – including STR DNA profiles – depends on data models (Butler)

## WHAT ARE COURTS SAYING?

### Source code:

“computer source code is a species of “text” that must be written onto a computer chip, and “concerns” scientific tests of the particular machine to which it relates, it is, contrary to the People's contention, a written document within the meaning of CPL 240.20 (1)(c).” *People v. Robinson*, 53 A.D.3d 63, 68 (2d Dept. 2008)

### Computer Files:

“[A] ‘written document’ encompasses electronic data . . . . This interpretation is consistent with the Penal Law definition of a ‘written instrument’ as ‘any instrument or article, including computer data or a computer program, containing written or printed matter or the equivalent thereof, used for the purpose of reciting, embodying, conveying or recording information’ (PL § 170.00[1]).” *People v. Gills*, 52 Misc.3d 903, 907 (Sup. Ct. Queens, 2016); *see also People v. Jones*, 55 Misc.3d 743 (Sup. Ct. Bronx, 2017)

...and a lot of other unreported cases.



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People v. Jones, 47 N.Y.S.3d 689, 696 (Sup. Ct. Bronx Ct'y 2017) (“[R]aw electronic data constitutes ‘property,’ i.e., discovery material, under CPL 240.20 because it constitutes a ‘portion of’ a written report . . . .”)

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People v. Lawton, Ind. No. 1253/15 (Bx. Co. Sup. Ct. J. Best, Sept. 2016) (holding electronic raw data was discoverable because it constitutes a written document concerning a scientific test made at the direction of law enforcement)

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People v. Crawford, Ind. No. 6170/09 (N.Y. Co. Sup. Ct., June 20, 2010, Wiley, J.) (Electronic raw data “is generally discoverable and potentially relevant.”)

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People v. Ivan Rodriguez, Ind. No. 2422/14 (Bx. Co. Sup. Ct., March 2016, Best, J.) (granting discovery of electronic raw data pursuant to CPL § 240.20(1)(c))

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People v. Franco, Ind. 3760/13 (Sup. Ct. Bronx Ct'y 2015) (Clancy, J.)

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People v. DeJesus, Ind. 3834/13 (Sup. Ct. Bronx Ct'y, Jan. 26, 2015) (Clancy, J.)

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People v. Grant, Ind. 604/13 (Sup. Ct. Bronx. Ct'y 2014) (Fabrizio, J.)

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People v. Jiminez, Ind. No. 3281/13 (Sup. Ct. Bronx Ct'y June 27, 2014) (Webber, J.)

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People v. Givens, Ind. 348/12 (Sup. Ct. Bronx Ct'y 2014) (Webber, J.) (finding electronic raw data discoverable under CPL § 240.20(1)(c))

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People v. Legrand, Ind. No. 2634/99, N.Y. Co. (ordering raw electronic data disclosed)

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People v. Dejesus, Ind. No. 03834-2013, J. Clancy, Bronx County Supreme Court, decision issued January 26, 2015

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# Not all judges think computer files are documents

- People v. Mohammed, 52 Misc.3d 242 (Bronx, 2016)(Barrett)
- People v. Carter, 50 Misc.3d 1210(A) (Queens, 2016)(Schwartz)
- People v. Tsintzelis, Ind. 821/14 (Sup. Ct. Queens Ct'y 2014) (Hirsch, J.)
- People v. Cadlett, Ind. 2376/13 (Sup. Ct. Queens Ct'y 2014) (Margulis, J.)
- People v. Moody, Ind. No. 257/13 (Richmond Ct'y, Nov. 21, 2014) (Rienzi, J.)
- People v. Jones, Ind. No. 5146/12 (Sup. Ct. Kings Ct'y, June 12, 2014) (Murphy J.)
- People v. Feola, Ind. No. 2669/11 (Bronx Ct'y, Aug. 9, 2013) (Benitez, J.)
- People v. Caballero, Ind. 10278/11 (Sup. Ct. Queens Ct'y 2012) (Knopf, J.)
- People v. Heyward, Ind. 4714/09 (Sup. Ct. New York Ct'y 2010) (Zweibel, J.).

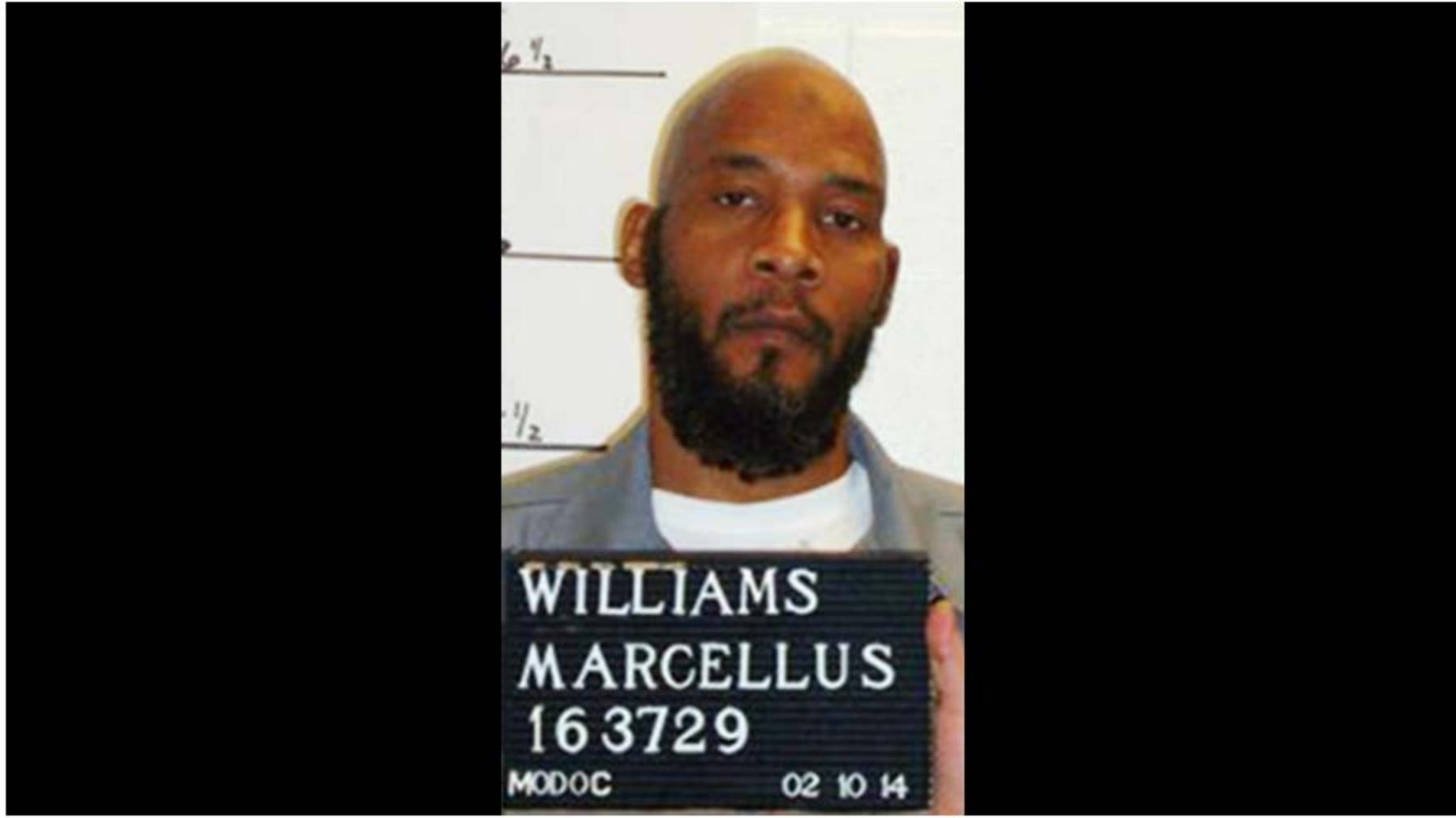
# Laboratory Protocols, frequency tables and interpretation guidelines

A copy of all standard operating protocols (SOPs), frequency tables and interpretation guidelines relied upon in connection with the testing in the instant case, including guidelines that address;

- (i) peak detection threshold(s),
- (ii) stochastic threshold(s),
- (iii) mixture interpretation involving major and minor contributors,
- (iv) inclusions and exclusions, and
- (v) policies for the reporting of results and statistics.



# The day Marcellus Williams didn't die



# 6<sup>th</sup> Amendment Violations

- Denial of right to cross w/o adequate documentation, particularly in subjective techniques
  - All pattern matching disciplines (See e.g., PCAST Report)
- *United States v. Smallwood*, 2010 WL 4168823 (W.D. KY) (“The match was effectively insulated from any meaningful cross examination by the inability to produce photographs representative of what an examiner sees under actual microscope.”)
- *United States v. Willock*, 636 F. Supp 2d 536 (D.Md. 2010) (“That a match exists is only as good as the underlying photographs, sketches and notes that support it.”)
- NOTE: Can compel the testing analyst to testify, enhancing discovery opportunities, *Melendez-Diaz v. Massachusetts*, 557 U.S. 305 (2009) 132 S. Ct. 2221 (2013); *Bullcoming v. New Mexico*; See also *Briscoe v. Virginia*, 130 S. Ct. 1316 (2010)(defendant cannot be compelled to call adverse witness)



# Nat'l Comm'n on Forensic Science (Rec. on Discovery to Invoke Authority)

Adversary party should be provided with . . . *detailed information about the kinds of analyses conducted of evaluation; testing; observations made; the opinions, interpretations, and conclusions reached; and the bases for those conclusions*

: <https://www.justice.gov/ncfs/file/786611/download>

- ▶ **See also PCAST:** “Determining whether an examiner has actually reliably applied the method *requires that the procedures used in the case, the results obtained, and the laboratory notes be made available for scientific review by others.* (p. 56)

# Nat'l Comm. On Forensic Science Views

**Recommendation #1:** Prosecutors should give an expert's report with: (i) *a statement of all opinions & underlying reasons*; (ii) *the facts or data examined*; (iii) *any exhibits that will be used*; (iv) *the witness's qualifications/ CV / other cases where he testified*; (v) *compensation agreement*.

**Recommendation #2:** Prosecutors should allow full access to the expert's case record.

**Recommendation #3:** If these exceed what is required by federal law, the Attorney General should authorize federal prosecutors to condition such additional disclosures on the defense's agreeing to provide the same broad disclosures if the defense intends to offer forensic expert testimony.



# Lab Protocols - Possible Conclusions

- Excluded
- Cannot be excluded
  - Included
  - Consistent With
- Inconclusive
- No DNA profile obtained
- More than one of the

A. On Item 15, the piece of drywall, it was a parcel DNA profile that was not sufficient for inclusion.

Q. Can you explain to us what that means?

A. That just means that the information that we had was not enough to actually say that there was a match. It's enough to say that someone is excluded from the data, they're not there, but it's not enough to say for sure that we have a match.

Q. And did you exclude anyone from - -of the standard that you looked at? Donald Kidd, were you able to exclude him?

A. He was not excluded. He was inconclusive, which means I - -I couldn't say for sure that he was there, but he was not excluded from it.

# Pre-trial challenges to DNA evidence

Preclude specific misleading language from analyst or the State

e.g. **McDaniel v. Brown, 558 U.S. 120**

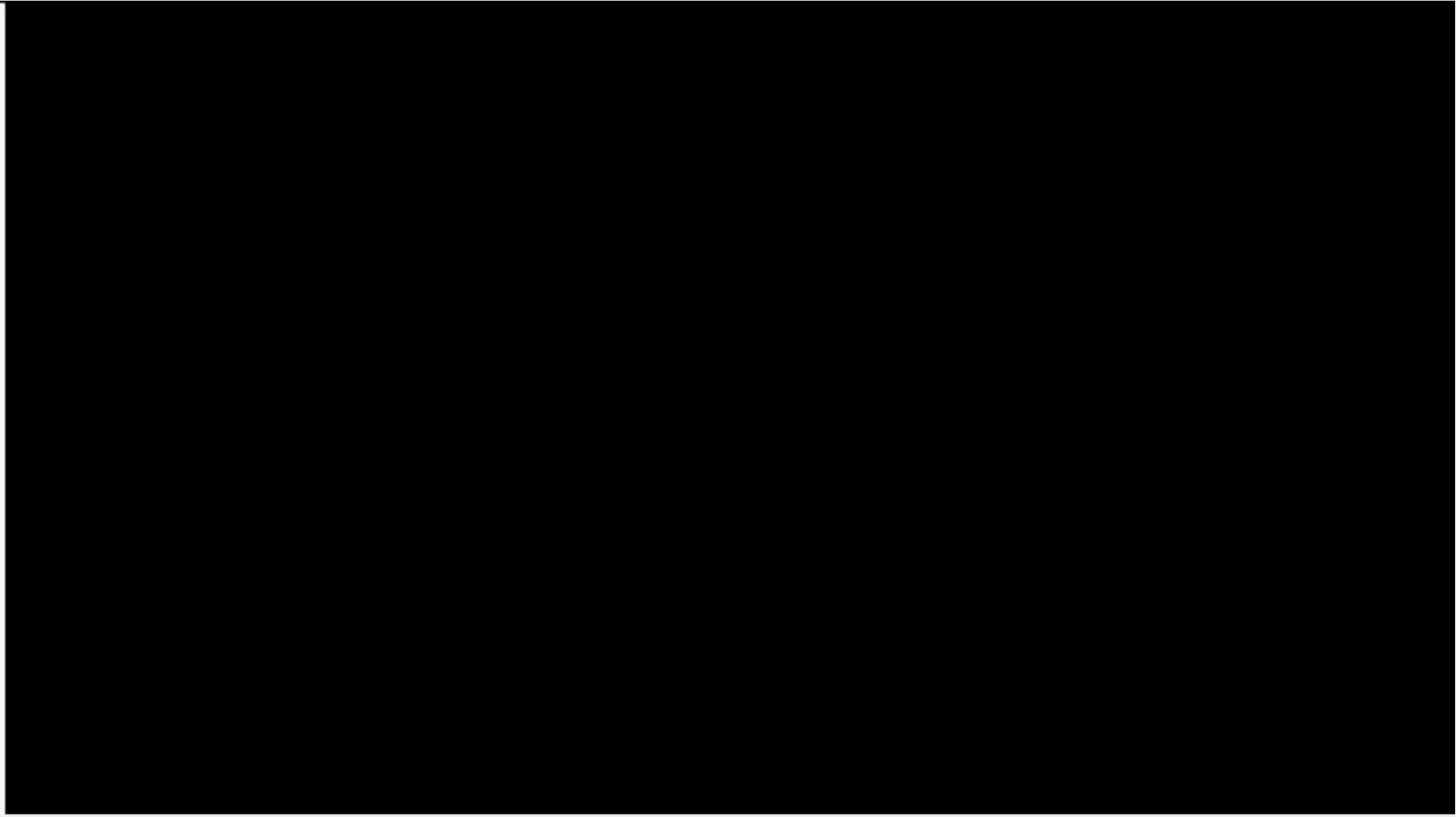
“The NRC Forensic Science Report expressed concern about terms such as ‘match,’ ‘consistent with,’ ‘identical,’ ‘similar in all respects tested,’ and ‘cannot be excluded as the source of.’ It asserted that these terms can have a ‘profound effect on how the trier of fact in a criminal or civil case perceives and evaluates scientific evidence.’ The American Bar Association’s Resolution 101C(2) urges judges to regulate the manner in which expert testimony should be presented at trial and to consider whether ‘experts used clear and consistent terminology in presenting their opinions.’ \*\*\* The overstatement or exaggeration of the value and/or limitations of the information and confusion as to the meaning of terminology by the end users can lead to the word’s misapplication. ”



# Challenging Useless or Misleading “Conclusions”

- Preclude results altogether (Motion in Limine)
  - not relevant in that it does not meaningfully narrow the pool of potential suspects
    - United States v. Graves 465 F.Supp.2d 450 (E.D. Pa. 2006) (low stat in a mixture).
  - the evidence is not helpful to the jury
    - Furness v. Pois, 11 Dist. Portage No. 99-P-0014, 2000 Ohio App. LEXIS 6120, \*17 (Dec. 22, 2000).
  - the calculation was not performed in compliance with scientifically defensible methods (*Daubert*)
    - Ind. Ins. Co. v. GE, 326 F.Supp.2d 844 (N.D. Ohio 2004)
  - its admission would confuse the jury, waste time, and is unfairly prejudicial
    - People v. Pike, (irrelevant, as it did not tend to make the issue of defendant's identification more likely than not.)





# Subjectivity and bias in forensic DNA mixture interpretation

Itiel E. Dror <sup>a,b,\*</sup>, Greg Hampikian <sup>c</sup>

## A B S T R A C T

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The objectivity of forensic science decision making has received increased attention and scrutiny. However, there are only a few published studies experimentally addressing the potential for contextual bias. Because of the esteem of DNA evidence, it is important to study and assess the impact of subjectivity and bias on DNA mixture interpretation. The study reported here presents empirical data suggesting that DNA mixture interpretation is subjective. When 17 North American expert DNA examiners were asked for their interpretation of data from an adjudicated criminal case in that jurisdiction, they produced inconsistent interpretations. Furthermore, the majority of 'context free' experts disagreed with the laboratory's pre-trial conclusions, suggesting that the extraneous context of the criminal case may have influenced the interpretation of the DNA evidence, thereby showing a biasing effect of contextual information in DNA mixture interpretation.

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Sci Justice. 2011 Dec;51(4):204-8. doi:  
10.1016/j.scijus.2011.08.004. Epub 2011 Sep 1.



# 17 Scientist Asked to Decide



- Excluded
- Could not be Excluded
- Inconclusive

# Results?

- 1 agreed with original analyst said: "cannot be excluded"
- 4 – Said "Inconclusive"
- 12 – Said "EXCLUDED"

# Why is Mixture Interpretation and Potential Impact of Bias Important?

Besides the choice of potentially misleading “lay” language to express a scientific conclusion....

Conclusion itself: is this a mixture of two people? Or two or more people?

Interpretation can impact the calculation of statistics, e.g. the weight of the evidence

Bias & Interest

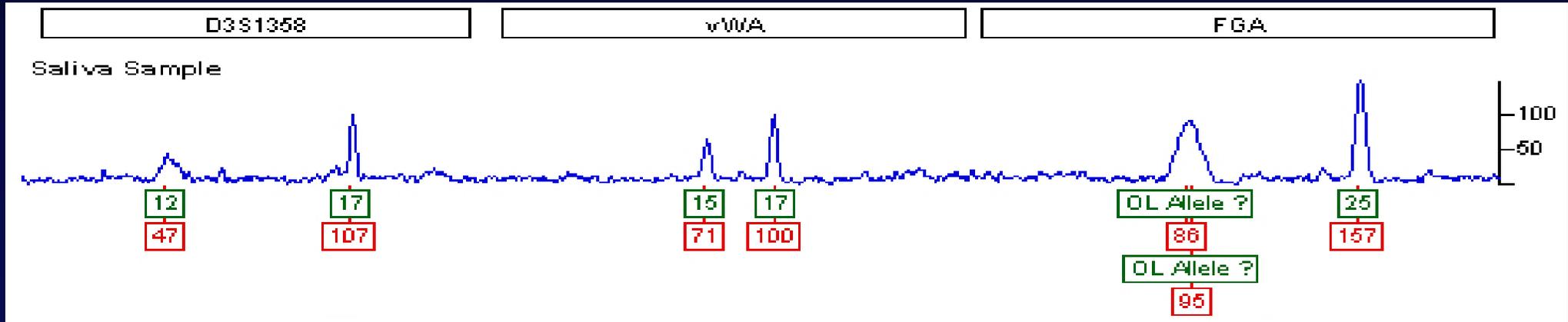
See Davis v. Alaska, 415 US 308 (1974) (right to cross on bias)



# Scientist Communications

just wanted to let you know, that based on this e-gram, I am going to request the evidence to be submitted. I am not proficient in Power Plex therefore I cannot make an official forensic call on this but if this was an Identifier Egram, it would be inconclusive for [REDACTED]. I do think there could be more than one contributor to the minor which could explain the additional peaks. There are peaks below reporting standards where I would expect them if [REDACTED] was a contributor. This is my opinion only and is why I will rework the evidence and make my own call to this. I thought I would let you know what I was thinking since this sample could potentially become an inclusion if the reanalysis pulls up the profile into the callable range. But if I get similar results as this, I still would call it inconclusive. Not an exclusion as Steve has stated.

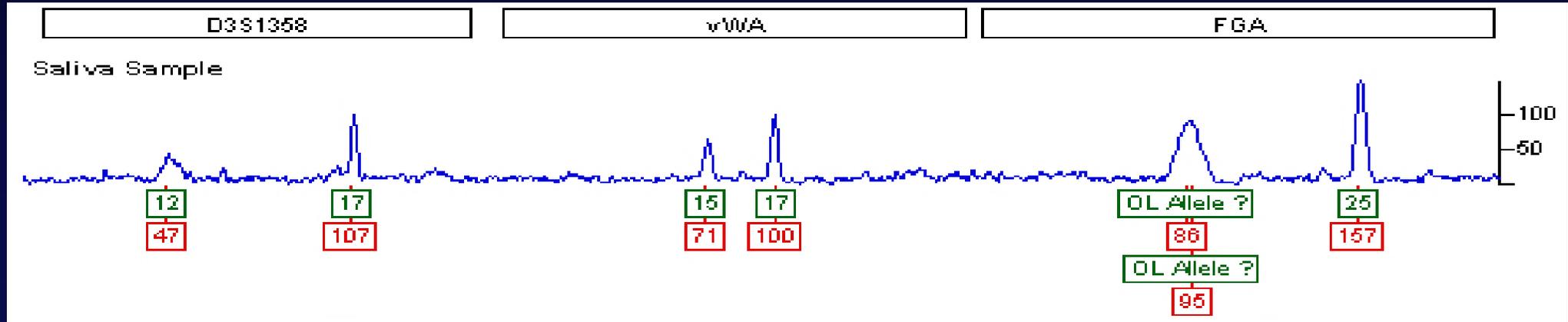
# Opportunities for subjective interpretation?



Can "Tom" be excluded?

<u>Suspect</u>	<u>D3</u>	<u>vWA</u>	<u>FGA</u>
Tom	17, 17	15, 17	25, 25

# Opportunities for subjective interpretation?

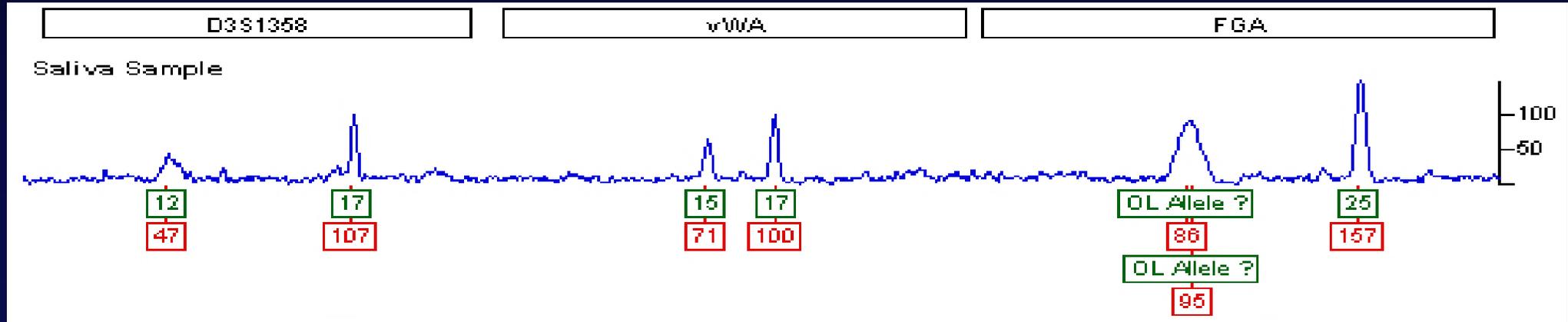


Can “Tom” be excluded?

<u>Suspect</u>	<u>D3</u>	<u>vWA</u>	<u>FGA</u>
Tom	17, 17	15, 17	25, 25

No -- the additional alleles at D3 and FGA are “technical artifacts.”

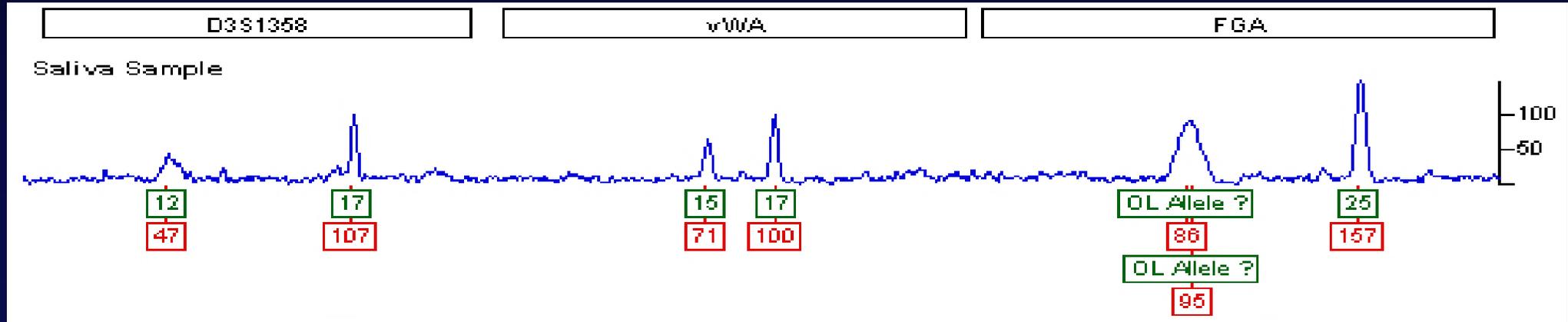
# Opportunities for subjective interpretation?



Can “Dick” be excluded?

<u>Suspect</u>	<u>D3</u>	<u>vWA</u>	<u>FGA</u>
Tom	17, 17	15, 17	25, 25
Dick	12, 17	15, 17	20, 25

# Opportunities for subjective interpretation?

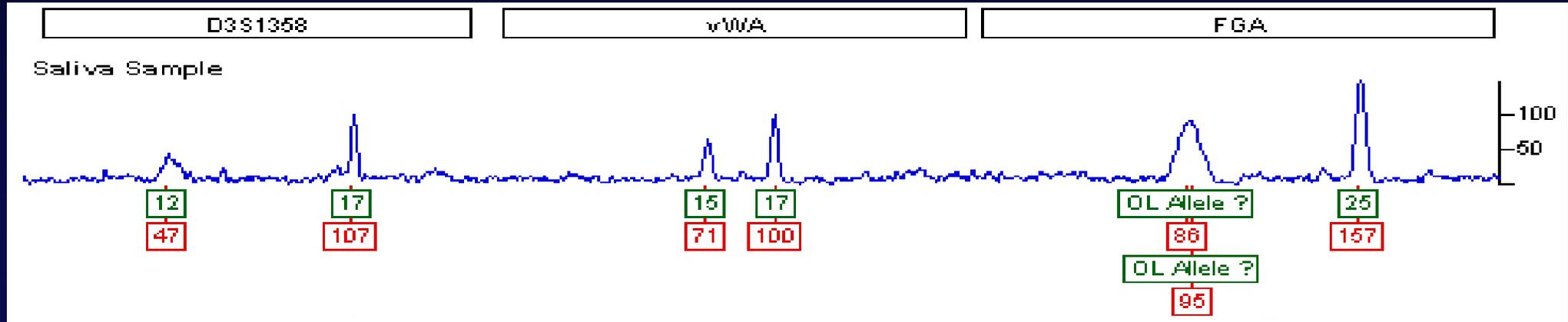


Can “Dick” be excluded?

<u>Suspect</u>	<u>D3</u>	<u>vWA</u>	<u>FGA</u>
Tom	17, 17	15, 17	25, 25
Dick	12, 17	15, 17	20, 25

No -- stochastic effects explain peak height disparity in D3; blob in FGA masks 20 allele.

# Opportunities for subjective interpretation?



Can “Harry” be excluded?

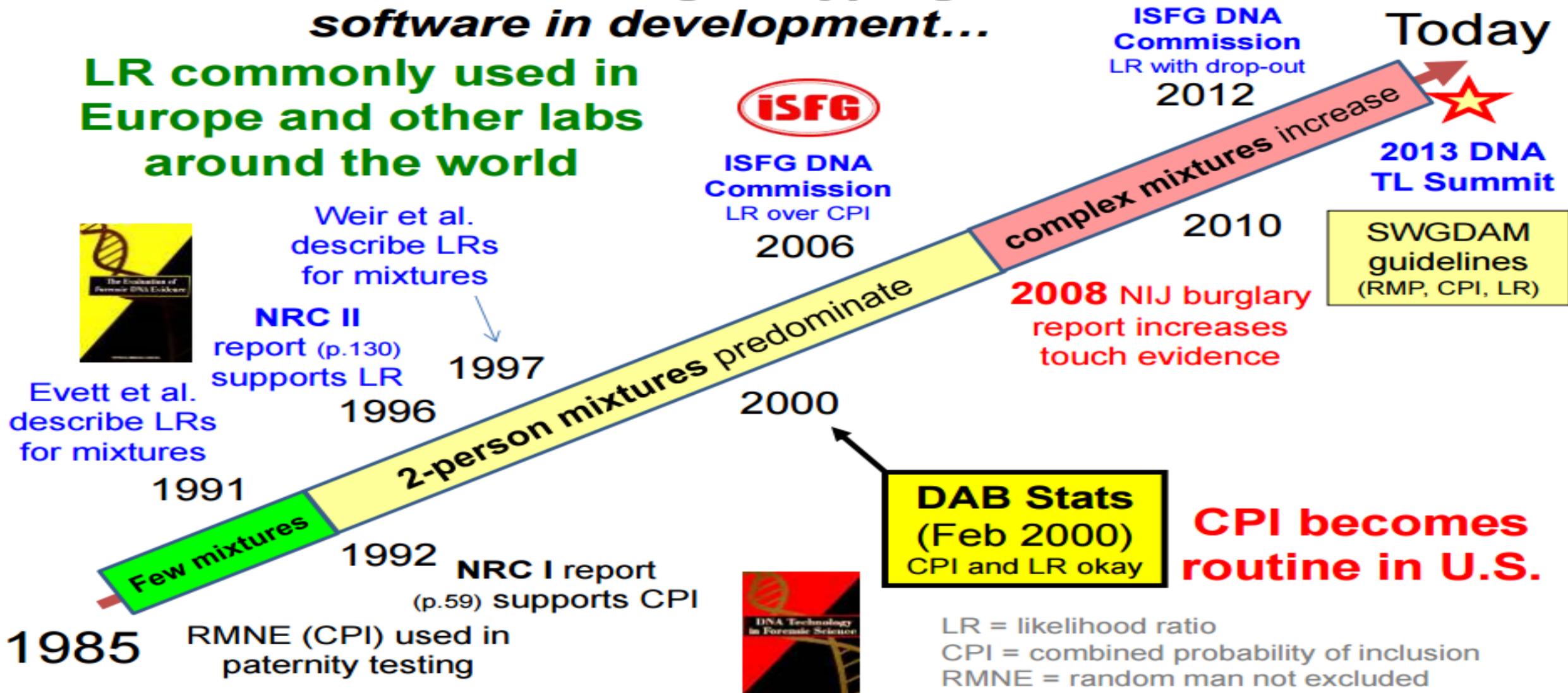
<u>Suspect</u>	<u>D3</u>	<u>vWA</u>	<u>FGA</u>
Tom	17, 17	15, 17	25, 25
Dick	12, 17	15, 17	20, 25
Harry	14, 17	15, 17	20, 25

No -- the 14 allele at D3 may be missing due to “allelic drop out”; FGA blob masks the 20 allele.

# Historical Perspective on DNA Mixture Approaches

**Probabilistic genotyping software in development...**

**LR commonly used in Europe and other labs around the world**



# Original SWGDAM Interpretation Guidelines

- 3.1.2 – Mixtures with Major/Minor Contributors: samples with distinct contrast of intensity among the alleles present – all loci should be evaluated
- 3.1.3 – Mixtures with Known Contributors: the profile of a known contributor can be subtracted from the mixture to determine the unknown contributor
- 3.1.4 – Mixtures with Indistinguishable Contributors: major and minor contributors cannot be determined therefore alleles can be compared for inclusion and exclusion

# Problems with 2010 Guidelines

- All of the preceding documents including the 2010 guidelines were written with two person mixtures from sexual assaults in mind
- By 2010 labs were already dealing with more low template and complex mixtures
- This was not news to the DNA community

# Results of MSS Studies

- Labs were first learning how to analyze STRs and interpret mixtures in MSS 1 (1997) & 2 (1999)
- Some of the participants didn't have mixture interpretation rules
- MSS 3 (2000-1) focused on the variation between labs analysis of STRs
- NIST determined that analysis instruments have a wide range of signal response for the same input of DNA and that threshold settings must be instrument and lab specific

# Mix 05

Interlaboratory study focused on how labs are interpreting data

69 Participating labs

Electropherograms were 2 person mixtures from sexual assault evidence

Wide range of variation in interpretation between labs

# Mix 13

- Interlaboratory study with 108 participating labs in U.S. and Canada
- Focus was on interpretation only
- Electropherograms represented sexual assault and property crimes evidence (5 cases)
- This is the first time complex mixture interpretation is addressed
- More labs implemented stochastic thresholds
- 70% of labs are using CPI
- Interpretation is all over the place
  - Different thresholds
  - Different interpretation of the guidelines
  - Different chemistry
  - Different stats (LR, RMP, CPI)



# SWGDM 2017 Guidelines: Do They Solve the Problem?

No.

**2.3.2** Where a clear major contributor does not exist in mixtures of greater than two people, further determination of definitive contributor genotypes may not be possible. The laboratory should establish guidelines based on peak height ratio assessments for identifying mixtures for which no major or minor contributors can be discerned. Probabilistic genotyping may be helpful in these instances.

# Changes Do Change Things

San Diego

**THE SUPERIOR COURT OF THE STATE OF CALIFORNIA  
COUNTY OF SAN DIEGO**

IN THE MATTER OF THE PETITION  
OF FLORENCIO JOSE DOMINGUEZ,

Petitioner,

HC 22238  
SCD 230596  
D060019

ORDER GRANTING PETITION  
FOR WRIT OF HABEAS CORPUS



# Discovery – Be Creative

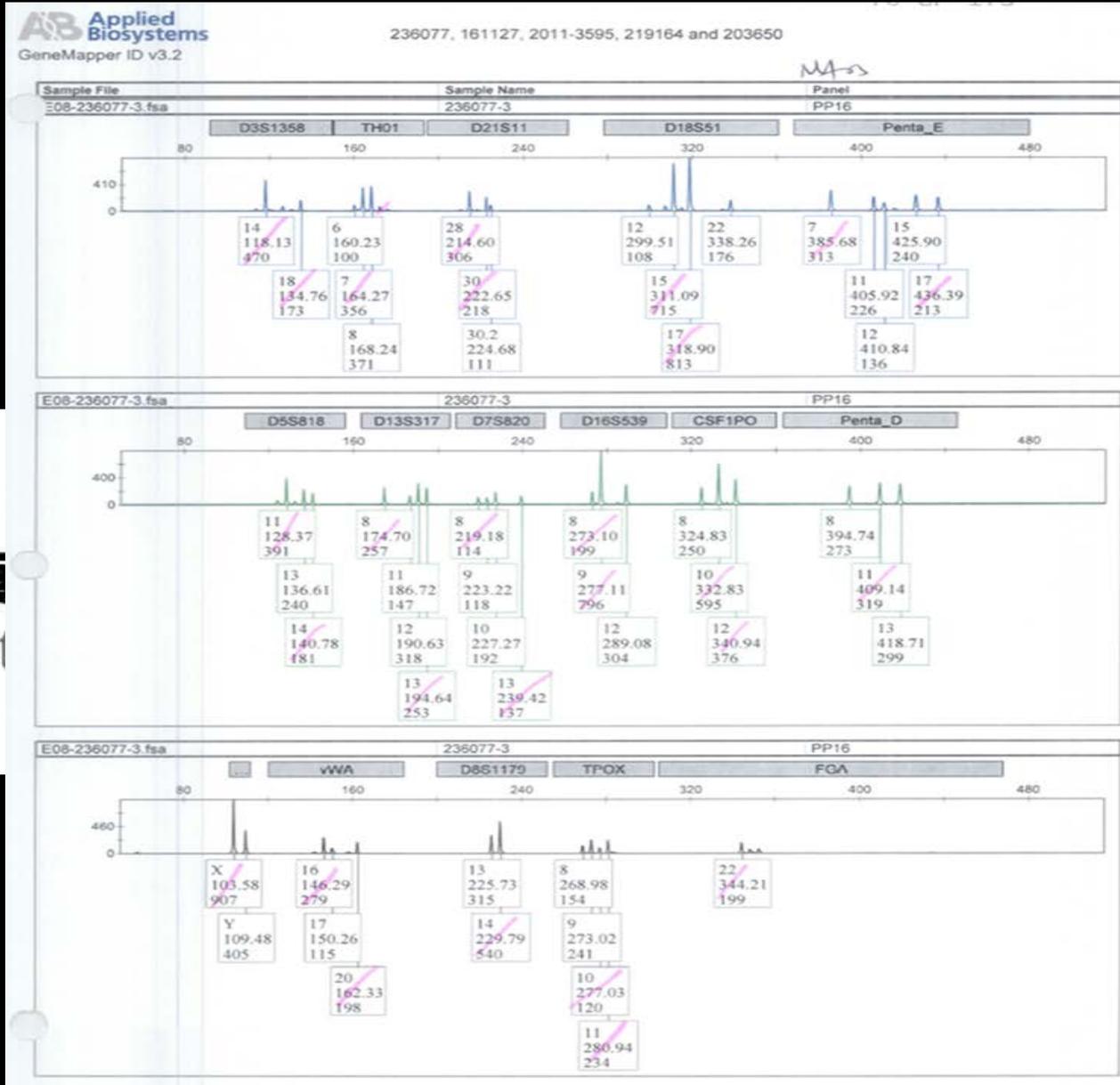
- Public Records Requests – protocols, validation studies, communications with out agencies.
- Sloppy investigation- Always Applicable
  - Kyles v. Whitley, 514 US 419 (Any piece of the investigation that could show it was sloppy undermines confidence and is therefore Brady)
  - Non-conforming work: (1) demonstrate that contamination occurs, (2) controls do not always show contamination, and (3) they cannot always determine the source of contamination
  - Proficiency Testing: does it match case work???

# Other reasons the report is not enough!

The report does not provide you all the information you need to try your case or properly advise you client!

## Results and Conclusion:

The DNA profile foreign to Dorothy [redacted] is excluded as a contributor to [redacted] obtained from item 3.



. David  
m 13.1)



Cuyahoga County Regional Forensic Science Laboratory  
 DNA  
 FINAL STR DATA SHEET

Case #: 236077

Date: 08/11/11

Item	D3S1358	TH01	D21S11	D18S51	Penta_E	D5S818	D13S317	D7S820
	14>	7,8>	28,30>	15,17>	7,11,15,	11,13>	8,12,13	5,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100



\*old Employer's DNA in RA 3-30-00  
 Mag 8/11/11

Page 1 of 2

Item	D3S1358	TH01	D21S11	D18S51	Penta_E	D5S818	D13S317	D7S820	Y	X	XY	17,18	13	8	23,24	
6-14-11NAB																
Positive PP16HS 6-17-11NAE	14,15	8,9,3	30	15,19	12,13	11	11	10,11	11,12	10,12	12	X	17,18	13	8	23,24
Negative PP16HS 6-17-11NAE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Positive PP16HS 6-17-11NAB RP	14,15	8,9,3	30	15,19	12,13	11	11	10,11	11,12	10,12	12	X	17,18	13	8	23,24
3 CODIS	14	6,8	30,2	12,22	11,12, 15	11,13	11,12	9,10	9,12	8,10	8,13	XY	17	13	8,9	-

P3037

No Data

> Peak height less than 50% of the Primary Peak

\*old Employer's DNA in RA 3-30-00 extractant on 3-30-00.  
 Mag 8/11/11

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# Legal Theories

- Daubert- insufficient proof of reliability/no validation/insufficient validation/error rates/peer reviewed
- Frye- novel/ no general acceptance/didn't follow accepted procedures
- Foundation
  - Can't be based on assumption/speculative
  - Too great a gap between data and opinion
- Relevance/ Prejudice- probative value so low
- Sixth Amendment



# Mixtures are a Mess

“What has not yet achieved universal agreement is the less objective selection of the appropriate population for statistical purposes and the actual statistical analysis which is to be applied to the physical analysis carried out in the laboratory. About the statistical treatment of the physical evidence there remains disagreement and continuing theoretical development. ... What is not universally agreed is what conclusions can validly be drawn from the matches observed in the sample.” Commonwealth v. Crews, 536 Pa. 508, 520 (1994).





# Office of the Hamilton County Public Defender

## Questions?

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513-946-3838

Office of the Hamilton County Public Defender

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