CaliforniaCivilLiberties.org

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Assembly Public Safety Committee
1020 N Street
Room 111
Sacramento, California 95814

RE: Assembly Bill 16 (Cooper)

Dear Committee Members,

The California Civil Liberties Advocacy (CCLA) is writing to enlist its **OPPOSITION** to AB 16 for the reasons listed herein:

(1) The mandatory collection of DNA samples from persons convicted of misdemeanors produces felony consequences and obscures the distinction between serious and less serious crimes, invalidating the very purpose for the distinction.

Traditional jurisprudence follows the axiom that the "punishment should fit the crime," and thus misdemeanor convictions have traditionally carried lesser consequences than those of felonies. But in modern times, as corporate corrections entities and the trade unions that staff them (sometimes thinly disguised as victims' advocacy groups) press for tougher laws and higher minimum sentencing legislation, the line is becoming ever blurred between what constitutes a lesser and a more serious crime. If misdemeanants will begin carrying the same punishments and consequences of felony convictions, including being forced to give up fundamental privacy rights, then the question is impelled as to whether or not the punishment really does fit the crime. If California's government is now choosing the path in which it ceases to distinguish between lesser and more serious offenses—namely, misdemeanors and felonies—then it defeats the purpose for having the distinction in the first place and advances the very "harder, not smarter" style policies which have led to the United States becoming the most over-incarcerated nation in the world.

(2) Recent studies suggesting that the interpretation of DNA evidence are often subjective are often overlooked or ignored in shaping public policy.

For several years, the CCLA has attempted to draw the attention of the California State Legislature to a peer-reviewed study that was published in Science and Justice in 2011. (See Attachment.) The abstract of that article states "[w]hen 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 . . . 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." While the consideration of DNA evidence and how it is used in California's criminal justice system may be beyond the scope of this particular bill, it is hardly an issue that should be ignored when the Legislature is presented with policy questions such as this. At the very least, these types of studies certainly cast a shadow of doubt on the reliability of DNA evidence.

(3) The mandatory collection of arrestees' DNA samples prior to obtaining a search warrant is inconsistent with the United States Supreme Court's holding in *Riley v. California* (2014) 134 S. Ct. 2473 [189 L. Ed. 2d 430].

As noted by Chief Justice Roberts in *Riley v. California* (2014) 134 S. Ct. 2473, 2493 (hereinafter, *Riley*), "the Fourth Amendment was the founding generation's response to the reviled "general warrants" and "writs of assistance" of the colonial era, which allowed British officers to [perform] an unrestrained search for evidence of criminal activity." On the surface, Assembly Bill 84 appears to be a win-win for both law enforcement and civil liberties proponents by codifying *People v. Buza* (2014) 231 Cal. App. 4th 1446 [180 Cal. Rptr. 3d 753], which struck down as unconstitutional certain portions of Proposition 69 — the *DNA Fingerprint, Unsolved Crime and Innocence Protection Act*. Upon closer inspection, however, AB 16 is merely a smoke screen which allows misguided but well-intentioned law enforcement interests to further erode the privacy and due process rights of citizens who have been accused of crimes. Prior to obtaining a warrant based on probable cause for specific criminal wrongdoing, the all-inclusive collection of DNA samples begins to resemble the "unrestrained searches" of colonial times.

In *Riley*, which questioned the constitutionality of a warrantless search of an arrestee's cell phone, the United States Supreme Court held that "[t]he fact that an arrestee has diminished privacy interests does not mean that the Fourth Amendment falls out of the picture entirely," and that "[n]ot every search 'is acceptable solely because a person is in custody,' " (Citing *Maryland v. King* (2013) 133 S. Ct. 1958 [186 L. Ed. 2d 1].)

When searching a modern cell phone, or "smart phone," the Supreme Court noted that "[a]n Internet search and browsing history . . . can be found on an Internet-enabled phone and could reveal an individual's private interests or concerns—perhaps a search for certain symptoms of disease, coupled with frequent visits to WebMD," (*Riley, supra*, at pg. 2490) and that such devices provide comprehensive record[s] . . . that reflect[] a wealth of detail about [a person's] familial, political, professional, religious, and sexual associations." (See *United States v. Jones* (2012) 132 S. Ct. 945, 955 [181 L. Ed. 2d 911, 925], Sotomayor, J., concurring.) Similarly, as described by an article in the Richmond Journal of Law and the Public Interest, "the tea leaves of [DNA] profiling will reveal connections from identification to gender to family to ancestry to behavioral profiling; and further to third party witnesses, alternate suspects, near matches (suspect relatives) and genetically identical siblings . . . DNA information is never viewed in

isolation but associated with other database searches that in toto are revealing a new identification mosaic." (Strutin, *DNA Without Warrant: Decoding Privacy, Probable Cause and Personhood* (2015) Rich. JL & Pub. Int.) In 2013, a genetics researcher randomly picked five anonymous people from a study group and was able to identify them by their DNA, along with their entire families (who had not participated in the study), identifying nearly 50 additional people. (Kolata, *Web Hunt for DNA Sequences Leaves Privacy Compromised* (Jan. 17, 2013) The New York Times.) And in 2015, it was revealed that the popular web-based company 23andMe had received requests from law enforcement for customer DNA data five times, but prevailed in resisting the requests. (Maldarelli, *23andMe Discloses Police Requests For Customer' DNA: Five users' DNA samples have been wanted by the cops* (Oct. 22, 2015) Popular Science.) It appears that law enforcement agencies are attempting to create sweeping DNA dragnets — something that individuals should be protected from by the federal and state constitutions. From these incidents, it is obvious that the breach of privacy concerns involved in the collection of DNA are far weightier than those of cell phones.

In *Riley,* the majority held that "when 'privacy-related concerns are weighty enough' a 'search may require a warrant, notwithstanding the diminished expectations of privacy of the arrestee.' " (Citing *King, supra*, at pg. 1958.) While the Supreme Court conceded that their holding in *Riley* "[would] have an impact on the ability of law enforcement to combat crime," the Court nonetheless held that "[prior] cases have historically recognized that the warrant requirement is 'an important working part of our machinery of government,' not merely 'an inconvenience to be somehow 'weighed' against the claims of police efficiency.' " (*Riley, supra*, at pg. 2493, citing *Coolidge v. New Hampshire* (1971) 403 U. S. 443, 481, [29 L. Ed. 2d 564].)

(4) DNA sampling of misdemeanants in the hope of finding a match constitutes a suspicionless search and sidesteps due process requirements, resulting in a genetic dragnet for the 21st century.

Allegedly, the reason for requiring DNA sampling of individuals arrested for serious and violent felonies is because such crimes are relatively rare and such offenders are more likely to have committed other serious offenses than misdemeanants, although this rationale is highly debatable. For example, according to the Judicial Council of California's *2014 Court Statistics Report*, a total of 241,238 felony dispositions were processed from 2012 to 2013, while the total for misdemeanors equaled 739,512 — more than three times that of felonies. (pp. 114-115.)

While proponents argue that misdemeanant DNA testing sometimes result in a match for serious or violent felony cases, the procedure wholly sidesteps due process requirements, resulting in a genetic dragnet for the 21st century. Requiring DNA samples in the hope of finding a match is in essence a suspicionless search, which the founders of this nation sought to protect its citizens from.

In the Ninth Circuit opinion *U.S. v. Kincade*, Judge Reinhardt stated in his dissent, "[t]he increasing use of DNA 'dragnets,' in which police officers encourage all individuals in a particular community to provide DNA samples to local law enforcement officials in order to assist an ongoing criminal investigation despite the absence of any individualized suspicion, serves as a concrete example of the type of practices which may shortly become commonplace

unless the gradual erosion of Fourth Amendment protections now set in place is reversed." (*U.S. v. Kincade* (2004) 379 F.3d 813, 849 dis. opn. of Reinhardt, J., Kozinski, J., & Hawkins, J.).)

(5) Even if DNA sampling of misdemeanants violates no constitutional boundaries, the government should not be granted such authority so as to store DNA profiles for limitless amounts of time.

While the author of this bill does seem to exhibit some good intent by mandating that a person's DNA profile be removed from the database if they are found innocent or the charges are dropped, what is to be done of DNA collected from convicted misdemeanants and which does not result in a match?

Statistical studies have revealed that the longer a person stays out of trouble, the less likely they are to commit a subsequent offense. (Cohen, *Does the Risk of Recidivism for Supervised Offenders Improve Over Time? Examining Changes in The Dynamic Risk Characteristics for Offenders under Federal Supervision*, Federal Probation — A Journal of Correctional Philosophy and Practice, Vol. 78, No. 2, September, 2014.)

Thus, what is the rationale for granting the government such authority to store and access DNA profiles without clearly defined limits? Such profiles should be removed after a period of time — e.g. five, ten, or twenty years, depending on the conviction. But that argument assumes the premise that suspicionless DNA testing is Constitutionally sound, in which CCJR most definitely does not.

(6) The consideration of DNA samples in plea agreements is coercive and inherently contradicts due process requirements. The practice perpetuates a growing bureaucracy with near-limitless authority to compile extensive dossiers on individuals, regardless of factual innocence or rehabilitation.

Proponents may argue that "if you have nothing to hide, then you have nothing to fear." But this rationale is overly broad and begs the question. Protecting one's privacy is not a singular issue and encompasses fears of government establishing a network by which to track its citizens. Allowing the government to perpetuate an ever growing, bureaucratic framework that allows law enforcement and other government entities to compile extensive dossiers, yet denying citizens the right to participate in how that information is used smacks of "Big Brother." The balance of power, especially under a democratic state, is frustrated between the people and the government by fostering a sense of mistrust, scrutiny, helplessness, and powerlessness. This "nothing to hide" argument proceeds from the false premise that protecting one's privacy necessarily constitutes some sort of criminal wrongdoing. Thus, coercing individuals accused of lesser crimes, who may have legitimate privacy fears as to how their DNA is stored and used in the future, is morally and ethically reprehensible. For instance, if such data were used to track the movements of and keep surveillance over such ones, this could have a chilling effect on the lawful exercise of First Amendment rights, such as free speech, free association, religion, or redress of grievances. Some have also argued that irresponsible use of such data could result in defaming one's reputation by guilt through

association, or exposing potentially embarrassing behaviors. (Boyd, *The problem with the 'I have nothing to hide' argument*, The Dallas Morning News, June 14, 2013.)

While the language of AB 16 may be ostensibly consistent with the recently de-published *Buza* opinion, the bill's author ignores the recent *Riley* opinion altogether. Why a constitutional lawyer would proffer that modern cell phones should be afforded greater protections from government intrusion than DNA—which the bill author himself has referred to as "the very stuff of life" (White, *Government DNA collection under microscope in California*, The Sacramento Bee, March 5, 2015)—is beyond sound jurisprudence and, as CCJR predicts, will not hold up to judicial scrutiny in the near future.

The legal scholar Daniel Solove recommends that "[a]ny deviation from the warrant and probable cause requirement should ensure the following:

1) Searches should be as limited as possible.
2) Dragnet searches should be restricted.
3) Searches conducted without warrants and probable cause must be done only when there are no other alternatives.
4) The government must prove convincingly why the searches are impractical with a warrant or probable cause.
5) The value of conducting the search without a warrant or probable cause must outweigh the harms caused by the search, such as invasion of privacy and the chilling of speech, association, and religion.
6) Mechanisms must be in place to ensure that people's rights are adequately protected and that law-enforcement officials don't abuse their discretion.
7) The government should be required to delete unused information after a certain period of time."

(Solove, Nothing to Hide — The False Tradeoff between Privacy and Security (2011) pg. 133.)

Due to all of the foregoing reasons, the CCLA **OPPOSES** AB 16 unless amended to address these concerns.

Respectfully,

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Subjectivity and bias in forensic DNA mixture interpretation ☆

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ABSTRACT

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.

Seeking and interpreting information in a biased way so that it fits existing beliefs, expectation, hope, or motivation is a result of how we reason and is widespread [1]. The potential for such biases in forensic science disciplines has been suggested before [2,3], and has now been highlighted by the National Academy of Science (NAS) report on *Strengthening Forensic Science in the United States: A Path Forward* [4]. It directly discusses "the potential for bias and error in human observers" (p. 8), and states that "the extent to which practitioners in a particular forensic discipline rely on human interpretation that could be tainted by error, [or] the threat of bias .... [is] significant" (p. 9). Indeed, empirical research supports the effects of bias in some forensic disciplines; for example, in fingerprinting, the same forensic experts may arrive at different conclusions when identical evidence is presented within different extraneous contexts (e.g., whether the detective believes the suspect is guilty, or the suspect confessed) [5–8].

However, in contrast to other forensic disciplines, DNA is regarded as the gold standard of forensic science [9]. DNA has been held as objective and immune to subjectivity and bias; "In the past several years, it has become commonplace in the courts, in the media, and in much of the technical literature, to contrast the scientific and objective evidence supplied by DNA profiling, with the experiential or subjective opinions given by traditional forensic experts" [9] (p. 97). Indeed, even the NAS distinguishes between "forensic science disciplines [that] are laboratory based (e.g., nuclear and mitochondrial DNA analysis, toxicology and drug analysis)" [4] (p. 38), and other forensic disciplines that are "based on expert interpretation of observed patterns (e.g., fingerprints, writing samples, toolmarks, bite marks, and specimens such as hair)" [4] (p. 38).

If correct, then DNA analyses should be consistent and not affected by domain irrelevant contextual circumstances. It seems, however, that at least in complex situations (such as with DNA mixtures) DNA does require and rely on human examiners making a variety of subjective judgements that are susceptible to bias. Indeed, in contrast to the view that DNA is objective, some have proposed that DNA analysis interpretations may be subjective and may even be influenced by a variety of factors [10,11].

However, such claims – both for the subjectivity or for the objectivity – of DNA analysis have rarely been examined and tested through empirical research. To investigate the subjectivity and biasability of mixture DNA analysis we observed and compared the conclusions on identical DNA evidence that was presented within and between different extraneous contextual information. To properly investigate this issue, it was critical to: 1. conduct the study with qualified DNA expert analysts who conduct real casework in accredited laboratories, and 2. that the examiners genuinely believed the contextual information, as contrived context within an experimental setup does not have the effect or impact as that of genuinely believed real context [8].

To achieve these goals we used mixture DNA analysis from a real adjudicated criminal case, using records obtained through the Georgia Freedom of Information Act. The case we chose provided us with analysis within extraneous context. We then took the same DNA evidence and presented it to 17 independent North American DNA expert analysts, but without the potentially biasing contextual case

☆ *One sentence summary:* DNA mixture interpretation is subjective and may be susceptible to bias by extraneous context, as evidenced by conflicting conclusions concerning the inclusion or exclusion of suspects.

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information. First we compared the consistency in interpretation and conclusion within those 17 examiners to assess subjectivity in DNA analysis. Then we compared between them and those who examined the DNA mixture within the extraneous context of the criminal case to assess biasability in DNA analysis. The DNA evidence related to a gang rape case in which one of the assailants testified against the other suspects in return for a lesser sentence as part of his cooperation in a plea bargain deal. However, those identified through the plea bargain denied any involvement in the rape.

The mixture DNA from the sexual assault was examined by experts in the real criminal case, and their analysis and conclusions were that the suspects that were identified by the cooperative assailant could not be excluded from being contributors to the mixture. The establishment of this corroborating fact was essential to the prosecution of the suspects who claimed innocence. Under the law of that state where this act occurred, the testimony of the admitted rapist would not be admitted without corroborating evidence. Therefore the DNA conclusions were critical to prosecution. If the suspects were excluded by DNA, or even if the DNA was "inconclusive", the incriminating testimony of the admitted rapist would most likely not be allowed. As potentially biasing as this domain irrelevant context was, if DNA was totally objective it should not have affected their analysis.

In this study we took the original materials used by the DNA examiners that concluded that the suspect cannot be excluded, and presented them to 17 other DNA examiners, 'context free.' These 17 DNA examiners were all expert DNA analysts who were working casework in an accredited governmental laboratory in North America. Fourteen were female and three were male; their mean age was 40.7 (SD = 5.86), and their mean years of experience conducting DNA analysis was 8.9 (SD = 3.96). Two examiners had a BSc, 12 had a MSc (either in biology or forensic science), and 2 had PhDs (one participant did not provide information on their level of education).

We asked the 17 independent DNA examiners to examine the DNA mixture along with DNA profiles of the victim and three suspects (Table 1) (one of the suspects, suspect 3, was the point of interest, as he was determined as 'cannot be excluded' by the DNA examiners who examined his DNA within the potentially biasing context). The evidence presented to them was comprised from the electropherograms (Figs. 1 and 2) available to the original examiners, and included the Vaginal Sperm Fraction (Profiler+) and Vaginal Sperm fraction (CoFiler). They were also provided with the *relevant* contextual information that was provided to the original examiners, such as the concentration of DNA in the sperm fraction extract, the DNA amplification conditions, and capillary electrophoresis injection times. Each of the 17 DNA examiners independently examined the evidence, and gave one of three conclusions for each of the suspects: 'cannot be excluded', 'excluded', or 'inconclusive.'

In regard to suspect three, the results obtained from the 17 independent DNA examiners varied. One examiner concluded that the suspect 'cannot be excluded', 4 examiners concluded 'inconclusive', and 12 examiners concluded 'exclude.' The results are revealing in two respects: First, the fact that the 17 DNA examiners were not consistent in their conclusions, by itself, suggests that there is an element of subjectivity in DNA interpretation. If it was totally objective, then all the examiners would have reached the same conclusion, especially since they all work in the same laboratory and follow the same interpretation guidelines. The observed inconsistencies within the 17 examiners who conducted their analysis on the identical evidence, 'context free,' demonstrated subjectivity in DNA mixture analysis, which may reflect individual differences (e.g., training, experience, personality, and motivation). It is interesting that even using the 'gold standard' [9] DNA, different examiners reach conflicting conclusions based on identical evidentiary data.

Table 1
Suspect 3 portion of the allele chart.

Locus	S3
D3	14, 17
vWA	17, 18
FGA	22, 24
D8	14, 15
D21	28, 28
D18	13, 18
D5	12, 13
D13	10, 14
D7	9, 10
D3	No data
D16	9, 13
THO1	7, 8
TPOX	9, 9
CSF1PO	11, 11

Second, comparing the data between examiners, those from the context free condition to those who were exposed to the extraneous context condition, it is possible that the domain irrelevant information may have biased their interpretation. The DNA analysts who concluded that the suspect cannot be excluded within the biasing context of the criminal case, are in sharp contrast to the vast majority of examiners who examined the same evidence without this biasing context. Only 1 (out of 17) gave the same conclusion as the original analysts, 16 other examiners reached a different and conflicting conclusion (either 'exclude', 12 examiners, or 'inconclusive', 4 examiners). Thus, the extraneous context appears to have influenced the interpretation of the DNA mixture, however, it is always hard to draw scientific conclusions when dealing with methodologies involving real casework.

It must be emphasized, however, that these effects were observed for a DNA mixture analysis. Previous research in forensic identification suggests that contextual influences are most powerful when the evidence is ambiguous, complex, and a 'hard call' [8]. When the data is clear and decisions are simple, then the power of context is diminished. Gill has been quoted to say that "If you show 10 colleagues a mixture, you will probably end up with 10 different answers" [12]. The difficulties and challenges presented by complex DNA mixture have been the focus of several discussions [13–21], and are an important component of 'expert systems' and statistical computing that try to more objectively deconvolute and interpret DNA mixtures [22,23].

The study reported here, the first experimental study exploring DNA interpretation, demonstrates that DNA mixture interpretation has subjective elements and may be susceptible to bias and other contextual influences. Minimizing such potential effects is important, and may include specific training on bias issues, as well as procedures and best practices especially designed to limit contextual influences (such as sequential unmasking [24]).

This study also demonstrates that all types of DNA analysis should not be lumped together as the "gold standard." It is true, that in contrast with many areas of forensic science [25], identity testing using DNA has progressed to the point of general acceptance when complete profiles are obtained from a single DNA contributor [26]. Consistent with this level of acceptance in the scientific community, the courts in the United States and elsewhere equate identity with DNA profiles that include complete allelic data from 13 or more of the standard short tandem repeat loci (STRs). However, in cases where low numbers of template molecules are amplified [27], or where complex mixtures are analyzed, subjective conclusions are made by analysts. This is evidenced by our experiment and the case we discuss, however, one cannot estimate its magnitude and impact without more empirical studies.

The great degree of variability in laboratory methods regarding DNA mixtures has been the subject of concern in the DNA community, and the Scientific Working Group on DNA Analysis Methods (SWGDAM). It is also important to note that while some laboratories in North America still report qualitative results such as "cannot exclude" without quantitative measure, the 2010 SWGDAM guidelines state that "The laboratory must perform statistical analysis in support of any inclusion that is determined to be relevant in the context of a case, irrespective of the number of alleles detected and the quantitative value of the statistical analysis." [28]

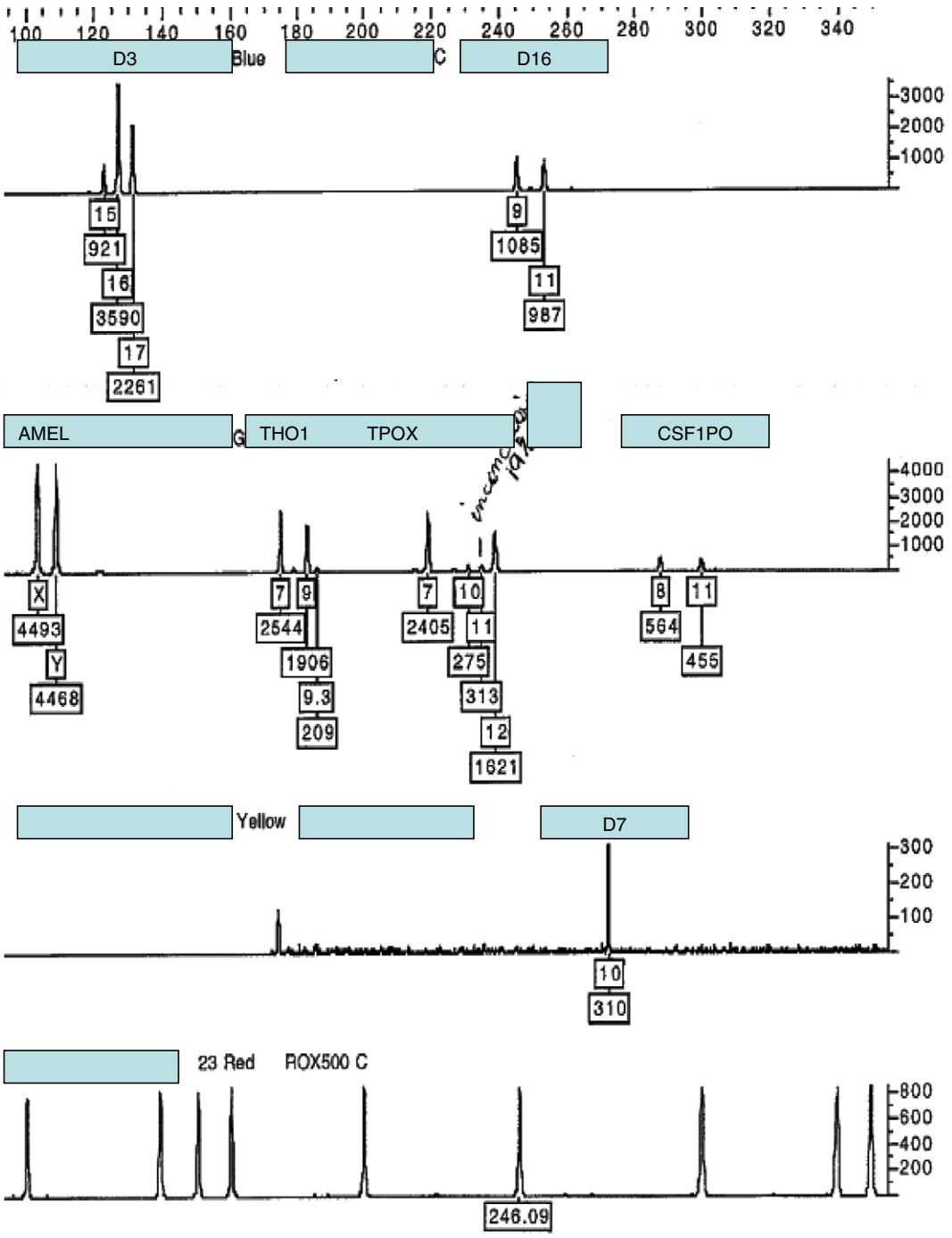

Fig. 1. Sperm fraction electropherogram from victim's vaginal swab, after amplification with CoFiler (ABI). This electropherogram was given to analysts for interpretation. Genetic loci are indicated in boxes above alleles.

These guidelines however are not binding, and are not required for The American Society of Crime Laboratory Directors Laboratory Accreditation Board (*ASCLD/LAB*) accreditation. Outside of North America, the *International Society for Forensic Genetics* (*ISFG*) DNA commission recommendations on the interpretation of mixtures strongly supports the use of likelihood ratios [16], and this approach is beginning to gain ground in North America.

It is also important to note that while this is the first published empirical study of potential DNA bias, Butler of the NIST laboratories has conducted extensive studies of mixture analysis over several years, wherein he supplies a large number of volunteer laboratories identical DNA mixture data and asks for their analysis. The results of these excellent studies have been presented at conferences and are available at the NIST webpages [29], but have never been published in a peer-reviewed journal.

An interesting and perhaps the most critical point for this paper is that Butler's research findings show that inclusion statistics for the same profiles (using the same data) varied over 10 logs, that is from 1 in 434,600 to 1.18×10^{15}, using the exact same electropherograms [29]. Therefore, although the use of statistics is paramount, it does not resolve the issue of subjectivity and potential bias, the topic of this study.

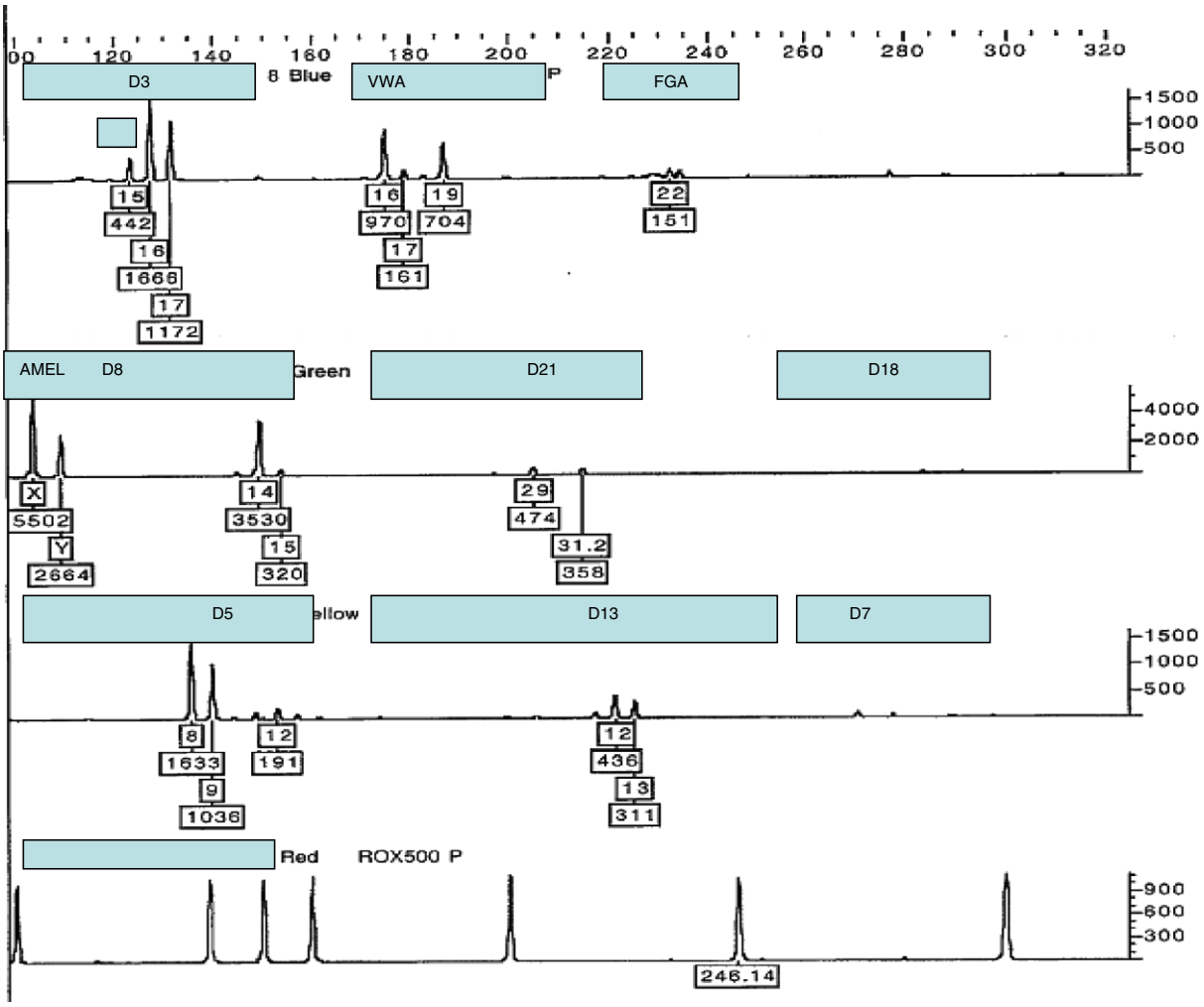

Fig. 2. Sperm fraction electropherogram from victim's vaginal swab, after amplification with Profiler Plus (ABI). This electropherogram was given to analysts for interpretation. Genetic loci are indicated in boxes above allele.

The work presented here is a step in addressing the subjectivity and potential for bias in DNA mixture interpretation. It is clear that additional and follow-up studies are called for. However, acknowledging the role of the human examiner, understanding the role (and weaknesses) of human cognition in making forensic comparisons (including DNA mixtures), is an important step in correctly conceptualizing forensic science and finding ways for improvements [30].

Appendix A. Supplementary data

Supplementary data to this article can be found online at doi:10.1016/j.scijus.2011.08.004. Additional information can be found at: www.cci-hq.com.

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