No. 10-8505

In The
# Supreme Court of the United States

SANDY WILLIAMS,

*Petitioner,*

v.

ILLINOIS,

*Respondent.*

**On A Writ Of Certiorari To The Illinois Supreme Court**

## BRIEF OF AMICUS CURIAE THE INNOCENCE NETWORK IN SUPPORT OF PETITIONER

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## INTEREST OF AMICUS CURIAE[1]

The Innocence Network (the Network) is an affiliation of organizations dedicated to providing pro bono legal and/or investigative services to prisoners for whom evidence discovered after conviction can provide conclusive proof of innocence. The 66 current member organizations of the Innocence Network represent hundreds of prisoners with innocence claims in all 50 states and the District of Columbia, as well as Canada, New Zealand, the United Kingdom, Ireland, and Australia. *See* Appendix A, Member Organizations.

Over the past two decades, the Network has introduced DNA evidence into courtrooms in its successful exoneration of hundreds of individuals. While DNA evidence has been used to correct wrongs past, the process of collecting physical evidence, extracting DNA, and conducting appropriate testing is not itself without flaws. The exoneration cases include cases in which a defendant was convicted by incomplete, incompetent, or faulty DNA evidence and testimony. These cases have revealed that DNA, like other forensic sciences, is susceptible to human error, incompetence, and misfeasance.

Given this experience, amicus curiae possesses a strong interest in ensuring that criminal convictions

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[1] Letters from the parties consenting to the filing of this brief are on file with the Clerk of the Court. No counsel for a party authored this brief, and no person other than the amicus curiae made any monetary contribution to its preparation or submission.

are premised upon valid and accurate scientific analysis—an interest directly implicated by Petitioner Sandy Williams's case. When the results of a forensic analysis are offered against a defendant—whether through a lab report or proxy analysis of that report—the author of that testimony must be subject to confrontation.

## INTRODUCTION AND SUMMARY

The evidentiary power of DNA evidence is unparalleled; in the past two decades, postconviction DNA evidence has been used to exonerate 273 individuals. Innocence Project, *Know the Cases*, http://www.innocenceproject.org/know/; *see also Dist. Attorney's Office for Third Judicial Dist. v. Osborne*, 129 S.Ct. 2308, 2312 (2009) ("DNA testing has an unparalleled ability both to exonerate the wrongly convicted and to identify the guilty."). As DNA testing continues to disprove other types of evidence, including other faulty forensic science, the general view that "DNA evidence does not lie" has become increasingly widespread. *See* William C. Thompson, *Tarnish on the "Gold Standard": Understanding Recent Problems in Forensic DNA Testing,* 30 Champion 10 (2006). Indeed, some courts have gone so far as to find DNA evidence alone is enough to support a conviction. *See, e.g., State v. Toomes*, 191 S.W.3d 122, 131 (Tenn. Crim. App. 2006); *Roberson v. State,* 16 S.W.3d 156, 172 (Tex. App. 2000); *Springfield v. State*, 860 P.2d 435, 449 (Wyo. 1993).

As important and powerful as it is, however, DNA evidence is not infallible. An increasing number of scandals surrounding DNA testing highlight the human element common to all forensic sciences. Review of the DNA exoneration cases reveals at least 15 exonerations where DNA evidence was tested prior to conviction. Greg Hampikian et al., *The Genetics of Innocence: Analysis of 194 U.S. DNA Exonerations,* 12 Annu. Rev. Genomics Hum. Genet. 97, 107 (2011); Brandon L. Garrett and Peter J. Neufeld, *Invalid Forensic Science Testimony and Wrongful Convictions*, 95 Va. L. Rev. 1, 63-66 (2009); Innocence Project, *supra*. In many cases, additional testing revealed that improper testimony regarding the methodology, results, or analysis was introduced at trial. *Id.* In at least one case, the original lab analysis itself was proven to be incorrect. *Id.*

Confrontation of the analyst who performed the DNA extraction and developed the genetic profile of the perpetrator is essential to permit proper adversarial testing of that evidence. This Court's decisions in *Crawford v. Washington,* 541 U.S. 36 (2004), *Melendez-Diaz v. Massachusetts,* 129 S.Ct. 2527 (2009), and *Bullcoming v. New Mexico*, 131 S.Ct. 2705 (2011), make clear that evidence of this sort is inherently testimonial, and hence subject to confrontation. An analyst's report and conclusions are more than just raw data. They certify that the analyst followed certain procedures, performed certain acts, and interpreted the results to arrive at the offered conclusions.

That the analyst's written report in this case was not itself introduced makes no difference: the substance of that testimonial report was still conveyed to the jury for the truth of the matter asserted through the testimony of another witness. The constitutional values at stake are the same whether the jury was shown the actual piece of paper, or told about its contents by a witness who could not be effectively cross-examined about its substance.

Here, the State set out to build a case based on the work of a lab analyst from Cellmark Diagnostics. The analyst received crime scene evidence, extracted biological material and, from a mixture of male and female DNA, developed a male profile. The critical issue at trial was the accuracy of this profile. Yet, the State never presented the Cellmark analyst. The source of this profile and how it was derived was thus never subject to cross-examination.

Instead, the State called an expert who presumed the reliability of the results, proclaimed they matched Petitioner Williams's profile, and provided statistical data of the random-match probability. An expert can certainly derive statistical results from the work of other scientists. Indeed, if the Cellmark analyst had testified, such extrapolation would be proper. But, when the validity of the analyst's underlying work is at issue, confrontation is necessary for the jury to determine the truth. Should the State's position be accepted, the State would be free to prove its case solely through surmise and extrapolations about

unconfronted evidence. That approach was rejected in *Bullcoming*; it must be rejected here.

## ARGUMENT

The right of a defendant to confront his accuser lies at the heart of the American criminal justice system. A defendant's Sixth Amendment confrontation rights are invoked when evidence is testimonial, or "made for the purpose of establishing or proving some fact." *Michigan v. Bryant*, 131 S.Ct. 1143, 1153 (2011) (citing *Crawford*, 541 U.S. at 51).

In cases involving accusations via forensic evidence, confrontation requires that the forensic analyst be called to the stand; forensic reports cannot be introduced absent live testimony by the performing analysts. *Melendez-Diaz*, 129 S.Ct. at 2527. Testimony by a surrogate analyst who did not perform or observe the tests does not satisfy the Confrontation Clause. *Bullcoming,* 131 S.Ct. at 2705. It should make no difference whether the written report is itself admitted into evidence, or the *substance* of the report is relayed to the jury through another witness, as here. In either case, a straightforward application of *Crawford, Melendez-Diaz,* and *Bullcoming* requires confrontation of the analyst who generated the accusing data.

Here, evidence created by a Cellmark Diagnostics analyst—the DNA profile of the presumed perpetrator—was conveyed to the jury without any

opportunity to cross-examine anyone who knew how that evidence was created. But confrontation was essential if the State intended to rely on the DNA profile developed by that analyst. It is both compelled by the demands of the Confrontation Clause under *Bullcoming* and *Melendez-Diaz*, and essential to effective functioning of the adversary process.

## I. Erroneous DNA Analysis Has Resulted in the Wrongful Conviction of the Innocent

Confrontation is essential in preventing the conviction of the innocent. Regardless of its scientific nature, DNA evidence, like all other forensic evidence, is subject to human error, bias, and malfeasance. *See* National Research Council of the National Academies [hereinafter "NRC"], *Strengthening Forensic Science in the United States: A Path Forward*, 132 (National Academies Press 2009), *available at* http://books.nap.edu/catalog.php?record_id=12589. Without confrontation to illuminate such errors, innocent individuals will be, and have been, convicted.

Faulty DNA analysis and reporting have led to a number of wrongful convictions in the past decade. Hampikian, *supra,* at 107; Innocence Project, *DNA Exonerations*, http://www.innocenceproject.org/docs/DNA_Exonerations_Forensic_Science.pdf. In many cases, subsequent DNA testing eventually exposed these errors. These cases demonstrate the limitations of DNA evidence: the accuracy of the test results are largely dependent on the methods used by the analyst. DNA

analysis is a sophisticated process, requiring many steps, and errors can occur during each stage of analysis.

A common error in DNA testing occurs early in the process during the handling and labeling of evidence. In labs across the country, suspects have been falsely accused after DNA samples from the victim and the suspect were accidentally switched, mislabeled, or contaminated. *See, e.g.*, Peter Jamison, *SFPD Crime Lab's DNA Evidence Could Be Tainted By Concealed Mistakes*, SF Weekly, Dec. 15, 2010, *available at* http://www.sfweekly.com/2010-12-15/news/sfpd-s-troubled-crime-lab-more-evidence-of-screwups-and-coverups/ (discussing sample switches and subsequent cover-ups in San Francisco crime lab); Trial Transcript at 66-69 & 222-26, *State v. Dishmon*, No. 99-4530, Jan. 10, 2000, *available at* http://darwin.bio.uci.edu/~mueller/pdf/bca_error.pdf (discussing problems of sample handling and analysis in Minnesota crime lab); Thompson, *supra*, (discussing errors of contamination and samples swaps in Texas, North Carolina, and Virginia). In the Washington State Crime Lab alone, investigation by journalists revealed that forensic analysts had tainted tests with their own DNA in at least eight cases. Ruth Teichroeb, *Rare Look Inside State Crime Labs Reveals Recurring DNA Test Problems*, Seattle Post-Intelligencer Reporter, Jul. 22, 2004.

In 1995, a mishandling error occurred at Cellmark Diagnostics—the same lab that performed the testing at issue here—in the case of John Kocak. In that case, like here, a vaginal swab collected from the

victim's rape kit was sent to Cellmark, which developed a DNA profile. In its report, Cellmark indicated that the DNA profile developed from the swab matched the profile of then-suspect John Kocak. Upon internal review, however, it was discovered that the names on the samples taken from the rape victim and Kocak had inadvertently been switched. Trial Transcript at 2-6, *State v. Kocak*, No. SCD110465 (San Diego Superior Ct. 1995), *available at* http://www.nlada.org/forensics/for_lib/Documents/1037341561.0/JohnIvanKocak.pdf. The result of this simple error was a false-positive DNA match. Cellmark analyst Charlotte Word testified that as a result of this switch, "the conclusions [in the report] would be incorrect" and that she could "make no conclusion regarding the faint bands" that were developed. *Id.* at 4. Here, Williams was entitled to confront the Cellmark analyst who performed the testing in his case about the potential for such mishandling.

Such simple human errors continue to occur. In Las Vegas, for example, mishandling of evidence in 2003 was only recently uncovered, resulting in the exoneration of Dwayne Jackson. In that case, 18-year-old Jackson was convicted of robbery after a seasoned DNA analyst accidentally switched DNA samples and incorrectly identified him as the person who committed the crime. Zahid Arab, *Metro Discovers DNA Error in 2001 Case*, CBS 8News, http://www.8newsnow.com/story/15041661/breaking-news-metro-discovers-dna-error-in-2001-case; *see also* Innocence Project, *Know the Cases: Dwayne Jackson*, http://www.innocenceproject.

org/Content/Dwayne_Jackson.php. The mistake was only uncovered this year when a DNA sample from the actual perpetrator was collected in connection with a different crime. *Id.* By then, Jackson had already completed a four-year prison term. *Id.*

False-positives and the conviction of the innocent also occur because of errors performed during the testing procedures themselves. In 1993 Timothy Durham was convicted of raping an 11-year-old girl and sentenced to 3000 years in prison. Innocence Project, *Know the Cases: Timothy Durham,* http://www.innocenceproject.org/Content/Timothy_Durham.php. At trial, the prosecution presented three pieces of evidence against him: the young victim's eyewitness identification, testimony that Durham's hair was microscopically similar to hair found at the crime scene, and a DNA test that reportedly showed that Durham's genotype matched that of the semen donor collected from the victim. William C. Thompson et al., *How the Probability of a False Positive Affects the Value of DNA Evidence*, 48 J. Forensic Sci. 47, 48 (2003). Durham presented eleven witnesses who placed him in another state at the time of the crime, but the jury rejected his alibi defense.

Subsequent postconviction DNA testing, however, revealed that Durham did not share the DQ-alpha genotype found in the semen, and that he was, in fact, excluded as the source of the DNA. *Id.* The initial false-positive results were attributed to the analyst's failure to completely separate male from female DNA during differential extraction of the semen stain.

Because of this failure, the victim's alleles, when combined with those of the true rapist, produced an apparent genotype that matched Durham's. The laboratory mistook this mixed profile for a single source profile and implicated Durham. *Id.*

Not all mistakes are inadvertent. Analysts, whether out of malice or a mistaken belief that they are helping to catch a criminal, have also falsified their reports, going so far as to provide fraudulent testimony. In 1990, Gilbert Alejandro was convicted of aggravated sexual assault in Ulvade County, Texas. Innocence Project, *Know the Cases: Gilbert Alejandro*, http://www.innocenceproject.org/Content/Gilbert_Alejandro.php. At trial, forensic analyst Fred Zain falsely testified that the profile developed from DNA tests performed on semen samples collected from the crime scene matched Alejandro's profile. *Ex-Bexar Serologist Charged With Lying*, The Dallas Morning News, July 27, 1994. Zain emphasized the strength of his findings, stating, "the banding patterns that were identified from [the semen sample] were identical to the banding patterns of Mr. Alejandro. As I stated in the report, they could only have originated from him." Garrett and Neufeld, *supra*, at 64. Subsequent review, however, revealed that testing was not even completed when Zain issued his report. *Id.* Worse, the final test results, completed after the trial, excluded Alejandro as the source of the semen. *Id.*

Similarly, a forensic report and expert testimony presented against Josiah Sutton included invalid and faulty DNA results that could not be discovered upon simple review of the analyst's report. In 1998, Sutton and an acquaintance were accused of raping a woman in the backseat of her car. Semen was collected from the victim's vaginal swab, as well as from a stain in the back seat. Innocence Project, *Know the Cases: Josiah Sutton*, http://www.innocenceproject.org/Content/Josiah_Sutton.php; Garrett and Neufeld, *supra*, at 64-66. DNA analysis was performed on the evidence, and Sutton was excluded as the source of the stain. That conclusion, however, was not mentioned in the official report or in the analyst's testimony at trial.

Analysis of the vaginal swab in Sutton's case revealed that a mixture of DNA from two male donors was present, though just one male profile was developed. *Id.* Statistical analysis of the profile indicates that it would match between 1-in-8 and 1-in-15 black men in Texas, including Sutton. *Id.* At trial, however, the forensic analyst provided no population statistics, and instead testified that Sutton's profile was an exact match with the vaginal swab profile, stating, "If it came from one person, it should have a same exact DNA pattern. No other two persons will have [the] same DNA except in the case of—of identical twins." Garrett and Neufeld, *supra*, at 65-66. The jury was thus left with the mistaken impression that the DNA evidence uniquely identified Sutton as the rapist—an impression Sutton and any defendant is entitled to confront.

The power and weight of DNA evidence makes it that much more important to confront. Confrontation of the analyst who performed the procedure is required to ensure that the methods were sound, procedures were followed, and the resulting data are reliable.

## II. Reliability of DNA Testing Is Not a Given, and Must Be Determined by a Jury After Adversarial Testing, Not By a Forensic Analyst Outside the Courtroom

The use of Sandra Lambatos's surrogate testimony allowed the prosecution to bypass confrontation in a manner wholly inconsistent with our adversarial system. *See Barefoot v. Estelle,* 463 U.S. 880, 899 (1983) (our "adversary system" is designed to permit the factfinder to "uncover, recognize and take due account" of the "shortcomings" of expert evidence); *see also Daubert v. Merrell Dow Pharm., Inc.,* 509 U.S. 579, 596 (1993) (endorsing "[v]igorous cross-examination" as a means of attacking scientific evidence). No one, not even the courts, may supersede the Confrontation Clause based upon their own judgment of reliability. *Crawford*, 541 U.S. at 36 ("The Constitution prescribes a procedure for determining the reliability of testimony in criminal trials, and we, no less than the state courts, lack authority to replace it with one of our own devising.") Yet, the Illinois Supreme Court's determination that Cellmark's report was reliable because Lambatos deemed it reliable did just that—it permitted the testifying

analyst's judgment to supplant adversarial testing of the evidence.

In short, Lambatos usurped the role of factfinder in deciding whether the evidence was trustworthy; upon receiving Cellmark's analysis and basing her opinion upon its unconfronted results, she decided for the jury what evidence was and was not true. When, as here, the underlying analysis is presented as evidence of an essential element of the crime—the identity of the perpetrator—presentation of this evidence effectively "rewards the state with a prima facie presumption that the prosecution has proven the truth of the report." Pamela R. Metzger, *Cheating the Constitution*, 59 Vand. L. Rev. 475, 490 (2006).

### A. Confrontation Can Reveal Errors and Limitations in DNA Analysis

*Crawford* expressly rejects a presumption of reliability as a basis for exempting testimonial hearsay from the adversarial process. *Crawford,* 541 U.S. at 51. Although modern DNA analysis has tremendous capacity to reveal truth and bring perpetrators to justice, its reliability is still subject to the problems of human error and misconduct that beset all forensic sciences. *See* NRC at 185; D.E. Krane et al., *Sequential unmasking: A means of minimizing observer effects in forensic DNA interpretation*, 53 J. Forensic Sci. 1006-07 (2008).

The Illinois courts' supposition that Cellmark's forensic report was purely objective is mistaken.

Forensic reports, including those created after DNA testing, are the product of multi-stage analyses and reflect complicated and subjective interpretations made by the performing analyst. It is thus vital that forensic witnesses' claims be subject to the ordinary Sixth Amendment process of cross-examination.

Recent research confirms that, even in DNA analysis, subjectivity and bias affect the analysis and interpretation of testing. *See* Linda Geddes, *Fallible DNA evidence can mean prison or freedom,* New Scientist (August 11, 2010), *available at* http://www.newscientist.com/article/mg20727733.500-fallible-dna-evidence-can-mean-prison-or-freedom.html?full=true (describing research showing that multiple DNA analysts, when presented with the same evidence, reached conflicting conclusions about whether the suspect matched it or not, especially in mixed-profile cases). Cross-examination of analysts who observed the procedures and thus know how the DNA analysis was performed is essential to both prevent and expose such potential biases. A competent cross-examination would involve questioning the analyst about each step of the process, delving into the potential for error at each step. Without in-court confrontation, there is little assurance that defense counsel will be able to probe any of these matters effectively, if at all.

### 1. Potential for Error in Step One of Analysis: Extraction

Several different procedures are used to extract DNA from a biological sample, including organic extraction, Chelex extraction, and various solid-phase extraction methods in which DNA is bound to a solid substrate and then washed. John Butler, *Fundamentals of Forensic DNA Typing* 99-106 (Academic Press 2010). Differential extraction is a type of organic extraction that is often used in sexual assault cases, like the present case, to separate sperm cells from the victim's epithelial cells. *Id.* at 105-06.

Differential extraction typically involves several steps that must be followed carefully to isolate the male suspect's DNA for subsequent analysis. *Id.* at 106. First, the analyst must add the appropriate chemical to the sample and warm the mixture to a precise temperature in order to break open the victim's epithelial cells. *Id.* Second, the analyst must spin the mixture in a centrifuge to separate the broken epithelial cells from the unbroken sperm cells. *Id.* Next, the analyst must remove the broken epithelial cells from the mixture. *Id.* Finally, the analyst must add an additional chemical to the sample to break open the sperm cells and release the male DNA. *Id.* Failure to adequately separate the male and female portions results in a mixture of DNA that can produce a mixed profile. *Id.*

During extraction, an analyst must also take great care to avoid contamination. *See Osborne*, 129

S.Ct. at 2327 (Alito, J., concurring) ("modern DNA testing technology is so powerful that it actually increases the risks associated with mishandling evidence."). Sample-to-sample contamination and introduction of extraneous DNA occurs more often during extraction than during any other stage of analysis. Butler, *supra*, at 101. Labs often take great precautions to protect against contamination because contaminated samples can produce misleading profiles. *Id.*; *see* I, *supra*. Because no one who testified at trial knew what precautions Cellmark took, there was no way to cross-examine the State's witnesses or evidence to probe for possible contamination.

Concern about contamination is not just theoretical. This Court, in *House v. Bell*, 547 U.S. 518, 547 (2006), recognized that potential contamination from the manner in which the defendant's blood-stained pants were packaged and shipped might have undermined test results that purported to link the blood stains to the victim. Cross-examination of someone who knows how the evidence was packaged and handled is essential to adversarial testing of the evidence.[2]

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[2] This is not to contend that the State must present the testimony of everyone "whose testimony may be relevant in establishing the chain of custody, authenticity of the sample, or accuracy of the testing device. . . ." *Melendez-Diaz*, 129 S.Ct. at 2532 n.1. *Melendez-Diaz* holds that the Confrontation Clause imposes no such duty. *Id.* But the Confrontation Clause does at least require the State to present the testimony of a witness who knows how the evidence was handled when unpackaged and

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### 2. Potential for Error in Step Two: Quantification and Normalization

Several different procedures are also used to quantify the amount of DNA in a sample. These procedures vary widely. In basic terms, quantification typically involves mixing the sample with a dye or other chemical, followed by observing the sample using a special instrument to measure fluorescence. Butler, *supra*, at 114-21. After the DNA is quantified, the analyst must dilute or concentrate (*i.e., normalize*) the DNA in the sample according to the requirements of the subsequent testing methods. *Id.* at 112.

To produce an accurate profile, the analyst must measure the amount of DNA in the sample accurately and normalize the sample to the proper concentration—an essential step because the analyst must use a specific amount of DNA in the subsequent stages of analysis. *Id.* at 111-12, 121; President's DNA Initiative [hereinafter "DNA Amplification"], *DNA Amplification for Forensic Analysts*, 13, https://amplification.dna.gov/. Too much DNA can result in exaggerated electropherograms[3] that can complicate interpretation.

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tested so that the testing can be assessed through the adversarial process.

[3] Electropherograms are displays of the data produced by the analyst using DNA separation and detection instruments. Butler, *supra*, at 194. The Cellmark report in the present case included at least one electropherogram and an allele chart interpreting that electropherogram. JA 61-62.

*Id.* Too little DNA can result in loss of data and failure to equally capture the different regions of DNA (*i.e.*, *alleles*) present in the sample, which also produces a misleading DNA profile. *Id.* Some methods, such as UV absorbance and yield gels, tend to produce more false readings than others. *Id.* at 114. Because no one testified at trial who knew what quantification and normalization steps Cellmark took, there was no way to cross-examine the State's witnesses or evidence to probe for errors.

### 3. Potential for Error in Step Three: Amplification

Modern DNA testing typically incorporates a process called polymerase chain reaction (PCR, or amplification) to produce millions of copies of the alleles that the analyst wishes to study. *Id.* at 125. This process allows analysts to develop DNA profiles from very small or low-quality biological samples. *Id.* An analyst starts a PCR process by adding chemicals called reagents to the sample along with water to achieve proper volume and concentration. *Id.* at 129. Commercial PCR kits with premixed reagents are widely used. *Id.* at 129, 139. The analyst then places the mixture in a thermal cycler that heats and cools the mixture to trigger the reactions that copy the DNA. *Id.* at 131. Often, as in the present case, multiple alleles are amplified simultaneously in a process known as multiplex PCR. *Id.* at 138.

Obtaining a balanced multiplex PCR reaction is challenging. *Id.* at 139. Multiplex kits prescribe certain protocols, but analysts sometimes vary these conditions to optimize the reaction. *Id.* Thermal cycling temperatures in particular are critical and must be precisely set. *Id.* at 131-32; DNA Amplification, *supra*, at 9. The number of cycles run by the analyst is similarly critical—an improper number of cycles can complicate the data. DNA Amplification, *supra* at 14. The analyst must also check the sample for PCR inhibitors such as textile dyes or plant matter that can result in the loss of larger alleles. Butler, *supra*, at 140.

Critically, the analyst must guard against contamination during the PCR process. Because PCR is very sensitive to small amounts of DNA, even minute contamination can skew the results. *Id.* at 141. Pre- and post-PCR sample processing areas and associated equipment should be physically separated. *Id.* Disposable gloves should be worn and changed frequently. *Id.* at 142. Aerosol-resistant pipette tips should be used and replaced with each sample. *Id.* PCR setup space should be irradiated when not in use, and equipment and workspaces should be cleaned with bleach or alcohol solutions between uses. *Id.* Failure to follow these procedures can allow the amplified DNA to contaminate subsequent samples. *Id.* Nonbiological impurities can also contaminate the sample and degrade the DNA. President's DNA Initiative, *Amplified DNA Product Separation for Forensic Analysts*, 19, https://separation.dna.gov/. Because

no one who knew what steps Cellmark took in the PCR amplification process testified at trial, there was no way to cross-examine the State's witnesses or evidence for potential errors or contamination in this very sensitive process.

### 4. Potential for Error in Step Four: Separation and Detection

The DNA fragments produced by multiplex PCR must be separated from each other and passed through a detector. Butler, *supra,* at 175. Separation is typically achieved through electrophoresis, in which the analyst places the DNA fragments in an electrically charged gel or capillary system. *Id.* at 175-76. The fragments migrate through the system and separate according to size. *Id.* at 177.

After separation, the analyst uses a detector instrument to measure the different fluorescent dyes that attach to each fragment during the PCR process. *Id.* at 186-87. This detection process produces a display that represents the specific alleles in the DNA sample. *Id.* at 194. This display takes the form of peaks on an electropherogram (if a capillary system is used) or dark bands on a gel image. *Id.* Most commercial multiplex PCR kits replicate a standardized set of alleles called short-tandem-repeat (STR) alleles. *Id.* at 205.

Analysts must be extremely careful to avoid cross-sample contamination when loading DNA samples in gels, which often contain wells for multiple

samples. *Id.* at 179. Capillary systems are more automated and less susceptible to contamination. *Id.* at 180. In the present case, Lambatos did not know whether Cellmark used a gel or capillary system. JA 74.

The analyst must also calibrate the detector instrument and associated data collection software so the software correctly associates the dye colors with the matching DNA fragments. Butler, *supra*, at 192. Calibration must be performed regularly because testing conditions can change over time and impact the fluorescence of the dyes. *Id.* at 193. Certain capillary separation systems have integrated detectors that calibrate automatically. *Id.* at 194. In the present case, Lambatos had no knowledge of the Cellmark analyst's calibration procedures. JA 60 ("I did not observe anything."). Because no one who knew what steps Cellmark took in the separation and detection process testified at trial, there was no way to cross-examine the witnesses or evidence for errors in this stage in the process.

### 5. Potential for Error in Step Five: Data Interpretation

An analyst must translate the data produced during the detection process into descriptive numbers for each allele observed. Butler, *supra,* at 205. The full set of descriptive numbers represents the DNA profile of the sample. *Id.* This process has several steps that differ based on the separation system used.

*Id.* at 206. To translate peaks on an electropherogram into a DNA profile, for example, the analyst must identify and measure the peaks, distinguish meaningful peaks from artifacts, compare peaks to various thresholds and standards, determine whether the DNA represents a mixture of two or more individuals, assign descriptive numbers to each allele, and confirm the findings. *Id.* at 205-06, 216-17; President's DNA Initiative [hereinafter "STR Data Analysis"], *STR Data Analysis and Interpretation for Forensic Analysts*, 16, https://strdata.dna.gov/. Some of these steps may be performed by computer software, but even these computer determinations can be overruled by the human operator. Butler, *supra*, at 206. While these steps involve application of objective criteria, they ultimately depend on subjective judgments of the analyst, to determine, for example, whether certain peaks are real DNA or background noise or artifacts, and to determine if and when to deviate from prescribed peak thresholds for identifying DNA. *Cf. Melendez-Diaz,* 129 S.Ct. at 2537 ("At least some of that methodology requires the exercise of judgment and presents a risk of error that might be explored on cross-examination.").

An analyst can make several errors that can lead to inaccurate interpretation. Improper calibration in the detection process can cause the analyst to misinterpret a peak as a different allele. Butler, *supra*, at 213-14. The analyst must correctly detect and measure the peaks in the standards, or the alleles in the sample may be sized or identified incorrectly. *Id.* at

214-15. The analyst must verify that the lab temperature is constant during detection, or allele peaks can migrate on the electropherogram and lead to incorrect interpretation. *Id.* at 214-15. The analyst must take special care when interpreting mixtures of two or more individuals, as in the present case, because of the risk of confusion. *Id.* at 216, 325-30; JA 68. Additionally, the analyst must guard against conscious and unconscious biases that may affect his or her interpretation of certain data. *See* Krane *supra*, at 1006-07. Because no one who knew what steps Cellmark took in the PCR amplification process testified at trial, there was no way to cross-examine the State's witnesses or evidence for potential errors or contamination in this very sensitive process.

### B. Confrontation is Necessary to Expose Potential Error in Data Generation and Interpretation

Cross-examination of an analyst who played no part in, and did not even observe, the actual extraction of the DNA and development of the profile cannot satisfy the Confrontation Clause. As the preceding discussion reveals, in any DNA case, critical inquiries focus on multiple issues; beyond basic questions of competency and honesty of the analysts, relevant inquiries include laboratory protocols, potential testing errors, and conclusions about the alleles identified—that is, the genetic profile at issue. Only once those steps are all accomplished does an expert compare profiles to conclude whether a

suspect can be excluded or included as the source of genetic material, and if included, provide statistical data on random match probabilities. In this case, only the expert who took the last of these steps—who analyzed the allelic profile produced by a different analyst and who then declared an inclusion and provided random match statistics—was available for cross examination. That left all other critical issues about the testing unexamined. As David Kaye noted in his recent book on DNA evidence:

> The limited nature of the random-match probability means that the statistic does not shed light on every issue that is relevant to deciding whether the samples that are being compared have a common source. Random-match probabilities and frequencies address a single question: How probable is it that two, correctly identified DNA genotypes would be the same if they originated from two unrelated individuals? By definition, they do not consider any uncertainty about the origins of the samples (the chain-of-custody issue), about the relatedness of the individuals who left or contributed the samples (the identical-alleles-by-descent issue), or about the determination of the genotypes themselves (the laboratory-error issue).

David H. Kaye, *The Double Helix and the Law of Evidence* 162-63 (2010). There is no reason in logic or law that the Confrontation Clause might be concerned about *only* the assessment of random match probabilities, and not all other issues relating to the

authenticity, reliability, and probative value of DNA evidence.

The electropherograms and allele chart sent by Cellmark to Lambatos represented testimonial assertions by the Cellmark analyst that the male DNA in the victim's vaginal swab exhibited a certain profile, and that the analyst generated the supporting electropherogram data properly. The electropherogram data generated by the Cellmark analyst were not infallible "raw" data, as suggested by the State, but were the end product of a complex, multistage human endeavor, subject to error at each stage. *See* JA 92-93 (State argued that DNA data were "mechanical results" and "raw data," akin to an X-ray). The data did not generate themselves; they were testimonial statements regarding the identity of the perpetrator made by the Cellmark analyst regarding the identity of the perpetrator. By transmitting these data to Lambatos, along with an interpretation, the analyst made additional, implicit assertions that he or she followed proper protocols to generate accurate data. The testimonial nature of these assertions was further illustrated in subsequent correspondence from Cellmark to the State, in which Cellmark offered documentation of the protocols used to generate the data. *See* Appendix B, July 1, 2002 Cellmark Letter.

Williams was denied any opportunity to confront the Cellmark analyst regarding her testimonial statements. At trial, Lambatos provided absolutely no information to Williams regarding any stage of

DNA analysis employed at Cellmark. JA 59-61. Lambatos was even unsure of the equipment used to process the sample and produce the data. JA 74-76.

Dr. John Butler, a veteran DNA analyst who regularly advises the FBI and U.S. Department of Defense regarding DNA analysis, notes that cross examination "provides the final level of review in order to confirm the DNA testing results." Butler, *supra*, at xvii, 302. Given the opportunity to confront the Cellmark analyst, Williams could have explored the following topics to determine the analyst's competence and objectivity, and in turn, the reliability of the analyst's statement regarding the forensic sample.

1. The analyst's educational and professional history. *See Melendez-Diaz*, 129 S.Ct. at 2537 ("Like expert witnesses generally, an analyst's lack of proper training or deficiency in judgment may be disclosed in cross-examination.").

2. Cellmark's Standard Operating Procedures and the analyst's understanding of them.

3. The manner in which the biological samples were packaged and shipped.

4. The reagents and solutions used in analysis. Many problems in DNA sequencing start with improper reagents and solutions, and this is the initial focus of most troubleshooting in DNA labs. Michele Godlevski & Thalia Taylor, *Good Laboratory Practices, Good Manufacturing Procedures, and Quality*

*Assurance in the DNA Sequencing Laboratory, in DNA Sequencing: Optimizing the Process and Analysis* 157, 168-69 (Jan Kieleczawa ed., 2005).

5. The lab's protocols for glove changing, pipette tip changing, and workstation cleaning to guard against contamination.

6. Concentration of the sample determined during quantification, which can affect data output.

7. The temperature settings of the thermal cycler used in PCR, which must be set precisely to ensure consistent results.

8. The analyst's search for PCR inhibitors in the sample, which can cause loss of larger alleles.

9. Whether the analyst used a gel-based separator, and if so, what precautions were used to guard against contamination during sample loading.

10. Methods used to calibrate the detector instrument, which is necessary for accurate data output.

11. The analyst's determination of and judgment to not report artifact spikes in the data, which might actually be evidence of additional contributors. Butler, *supra*, at 217; STR Data Analysis, *supra*, at 17-20.

12. The analyst's characterization of peaks found in "stutter" positions on the electropherogram, which might not be true alleles. *Id.*

13. The analyst's lab notes, including any information unrecorded in the final results, and any indications that something unexpected occurred during analysis, such as potential contamination. *See* Godlevski, *supra*.

14. Any information known to the analyst or the lab that might have affected its ability to remain objective. In particular, Williams might have asked whether the analyst had knowledge that the State had, less than a year prior to Williams's trial, cancelled a DNA-testing contract with one of Cellmark's competitors, Bode Technology, because Bode had repeatedly failed to find semen on forensic samples. *See* Gretchen Ruethling, *Illinois State Police Cancels Forensic Lab's Contract, Citing Errors*, N.Y. Times, Aug. 20, 2005, *available at* http://query.nytimes.com/gst/fullpage.html?res=9D05E0DB103EF933A1575BC0A9639C8B63.

Williams had a right to confront the analyst herself—or someone who knew about these matters—to determine how these matters might have affected the analyst's statement regarding the DNA profile on the vaginal swab. Confrontation of Lambatos allowed no investigation of these issues whatsoever. There is no reason to deviate from the mandates of the Confrontation Clause, as defined in *Melendez-Diaz* and *Bullcoming*.

### C. Confrontation Ensures More Complete Forensic Reports

Under the Illinois Supreme Court's holding, the declarant of an out-of-court statement created in support of the prosecution does not have the same incentives provided by confrontation to cautiously and conscientiously draft her report to avoid the possibility of later impeachment. Rather, with statements submitted solely in writing, information can easily be spun, misrepresented, omitted or fabricated precisely because no follow-up questioning or testing is afforded. This Court has previously recognized that forensic reports generally do not capture the full spectrum of tasks an analyst performs. *Melendez-Diaz*, 129 S.Ct. at 2536-37. Scientists and scholars alike have also noted the subjective nature of forensic reporting and the need for rigorous cross-examination to expose errors or omissions that may not be reflected in the report. *See* NRC at 186; Joel D. Lieberman, *Gold Versus Platinum: Do Jurors Recognize the Superiority and Limitations of DNA Evidence Compared to Other Types of Forensic Evidence?* 14 Psych. Pub. Pol. and L. 27, 50 (2008); *see also* Jessica Gabel, *Forensiphilia: Is Public Fascination with Forensic Science a Love Affair or Fatal Attraction?*, 36 N.E. J. Crim. & Civ. Con. 233, 239 (2010).

The case of veteran Washington state DNA analyst John Brown is illustrative. In 1997, Brown conducted a DNA test on vaginal swabs collected in an unsolved rape case. Ruth Teichroeb, *Oversight of Crime-Lab Staff Has Often Been Lax*, Seattle

Post-Intelligencer, at A1, July 23, 2004, *available at* http://www.seattlepi.com/local/article/Oversight-of-crime-lab-staff-has-often-been-lax-1149961.php. Although Brown developed a DNA profile of a possible male suspect, he was unable to find a match in the convicted-felon DNA databank. Upon review, his supervisor noticed that Brown had missed one of the markers in the DNA test. Brown reran the correct profile and produced a match with defendant Craig Barfield. In issuing his final report linking Barfield to the DNA profile, however, Brown made no mention of his first test and falsely claimed that he had never performed it. Only after extensive cross-examination did the truth come out. *Id.*

### D. Confrontation Requires Only That Someone with Personal Knowledge Be Available

Although it is preferable that the performing analyst be called to testify, he is not the only one who could fulfill the confrontation requirement. Any qualified expert witness who observed the testing procedures, can testify as to the results. Thus, the prosecution's case need not hinge on the availability of a sole analyst. A supervisor who monitored the testing as it was performed or a reviewing analyst who observed a videotape of the procedures would equally satisfy a defendant's right to confrontation. This form of evidence satisfies the defendant's right to an "adequate" and "prior opportunity for cross-examination." *Crawford*, 541 U.S. at 54, 57. Anyone

with substantive knowledge of the testing actually conducted in this case—that is, anyone who can be meaningfully cross-examined about the testing that produced the profile that Lambatos analyzed —would suffice. *See id.* Moreover, this procedure could minimize the expense and inconvenience to the government of producing forensic experts for cross-examination on the day of trial, and could significantly reduce the disruption of laboratory analysts' work schedules. Here, the problem is that no one who could speak to what actually happened during the testing of the vaginal swab was made available for cross-examination.

## III. Forensic Analysis is Testimonial and Subject to Confrontation

Permitting Lambatos to introduce the substance of the Cellmark analyst's conclusions, without making the Cellmark analyst available for cross-examination, provides insufficient safeguards against DNA testing errors. More fundamentally, such a procedure is constitutionally impermissible, because the Cellmark analyst's evidence is testimonial, and hence subject to the Confrontation Clause.

### A. Cellmark's DNA Analysis Was Created Solely for Testimonial Purposes

The Cellmark analyst's electropherograms and allele chart were themselves testimonial as they were made to establish a fact at trial—namely, the

identifying profile and the identity of the perpetrator. Such evidence is testimonial because it acts as a witness and bears testimony against the accused. *See Crawford*, 541 U.S. at 51. Thus, in developing a DNA profile from crime scene evidence, a forensic analyst serves as a witness to the crime, providing a description of the perpetrator that only an expert who observed the testing process is capable of articulating. It makes no difference that the description of the perpetrator is provided in terms of an electropherogram or allele chart: confrontation is still required of the individual offering a description of the perpetrator used at trial.

The courts have upheld the importance of the Confrontation Clause in cases where identity is at issue. *See, e.g.*, *United States v. Hinton*, 423 F.3d 355, 361 (3d Cir. 2005) (witness's out-of-court statement identifying defendant to police officers was testimonial and requires confrontation); *United States v. Pugh*, 405 F.3d 390, 399 (6th Cir. 2005) (witness's positive identification of defendant was "testimonial" because was given during police interrogation, was made to government officer, and because "any reasonable person would assume that a statement that positively identified possible suspects . . . would be used against those suspects in either investigating or prosecuting the offense.") In cases involving eyewitness identifications, the State is not permitted to introduce a witness's description of the perpetrator without giving the defendant an opportunity to confront the witness who provided it. So fundamental is the right

to confrontation that even victims themselves are not protected from the crucible of cross-examination. *See e.g., Giles v. California*, 554 U.S. 353 (2008) (judge's assessment that defendant caused death of witness did not dispense with confrontation requirements); *Maryland v. Craig*, 497 U.S. 836 (1990) (confrontation of child-victim required, but permissible via live video-feed). Forensic analysts deserve no greater protection.

Yet, protection from confrontation is precisely what the State seeks when it claims that it was Lambatos, and not Cellmark, who identified Williams as the perpetrator. It was Cellmark that provided the description with which Lambatos made an identification. Thus, it is Cellmark, as well as Lambatos, that Williams was entitled to confront. Cellmark's development of the DNA profile from the vaginal swab is in effect no different than a witness to a crime telling the police during interrogation that the perpetrator was 6'2", 180 pounds, with dark hair and a unique tattoo across his forehead; the prosecution would be unable to introduce that description without calling the actual witness to the stand. And it certainly could not evade Confrontation by presenting *only* the testimony of a police officer that the defendant fit the description of the perpetrator perfectly, right down to the matching height, weight, hair, and facial tattoo. Lambatos's comparison of the Cellmark profile to Williams's profile does not render confrontation of the Cellmark analyst moot. Lambatos's comparison

meant nothing without Cellmark's description of the male DNA in the sample.

The fact that Cellmark's report itself was not introduced at trial makes no difference as to Williams's right to confront the analyst. In calling Lambatos to testify, the prosecution introduced three pieces of evidence: 1) the profile developed by Cellmark from the victim's vaginal swabs; 2) Sandy Williams's profile as developed by a third analyst, Karen Kooi; and 3) Lambatos's opinion that the two profiles matched. All three pieces of evidence, including Cellmark's analysis, were introduced to prove the identity of the perpetrator. Indeed, Lambatos could not have rendered her opinion without the original findings created by Cellmark, and a jury could not have viewed Lambatos's opinion as relevant unless it accepted Cellmark's findings as accurate. As such, confrontation was required as to all three. Notably, while the State argues that confrontation was not required for the profiles underlying Lambatos's opinion, the State did call the analyst who developed Williams's profile, to testify as to the methods and procedures she followed. JA 12-14.

### B. *Melendez-Diaz* and *Bullcoming* Require Confrontation of the Cellmark Analyst

The State's position—that expert reports created in preparation for trial and relied upon by a non-observing expert are admissible without confrontation—threatens the very foundation of the adversary

system and denies a defendant his constitutional rights. Affirming this practice would permit the prosecution to bootstrap a finding of guilt by both admitting unconfronted testimonial evidence, and then bolstering the underlying findings with the testimony of its own expert, who took no part in the analysis, did not observe the analysis, and had no personal knowledge of the procedures used during testing. Admission of such testimony would directly contradict this Court's holdings in *Melendez-Diaz* and *Bullcoming*.

This Court has clearly established that forensic analysis is testimonial and subject to confrontation. In *Bullcoming*, the State sought to introduce the signed and certified report of forensic analyst Chris Caylor through the surrogate testimony of Gerasimos Razatos. Caylor, a state toxicologist, performed a blood-alcohol analysis using a gas chromatograph machine on a blood sample taken from the defendant. Caylor was subsequently placed on unpaid leave, and the State sought to introduce his report at trial through the testimony of Razatos, who stated that he was familiar with the type of procedure used. Despite the State's assertion that Caylor was a "mere scrivener" of the results produced by the gas chromatograph, this Court found that, although the "[g]as chromatography is a widely used scientific method," it was not inherently reliable, is testimonial, and thus subject to confrontation. *Bullcoming,* 131 S.Ct. at 2711 n.1.

Here, like the gas chromatograph testing performed by Caylor in *Bullcoming,* the DNA analysis performed by Cellmark in this case was done at the behest of law enforcement. JA 51-52; *Bullcoming,* 131 S.Ct. at 2717 ("Here as in *Melendez-Diaz*, a law-enforcement officer provided seized evidence to a state laboratory required by law to assist in police investigations."). Similarly, the analysis performed by Caylor "required specialized training" and the use of specialized machinery, much like the DNA analysis performed at Cellmark here. *Bullcoming,* 131 S.Ct. at 2711. Operation of both the gas chromatograph and the complex apparatus used in DNA testing involve several steps, and as this Court noted, "human error can occur at each step." *Id.* Finally, just like in *Bullcoming*, the State here "did not call as a witness the analyst who signed the certification" (in this case, the report submitted to Lambatos). *Id.* The surrogate witnesses in both cases had "neither participated nor observed" the procedures about which they were testifying. *Id.;* JA 60.

The only difference between the facts here and those presented in *Bullcoming* is the formal admission of a piece of paper—the State here did not move to admit the certification created by the original analysis, but fully introduced the accusatory substance of that paper. This failure, however, only exacerbates the constitutional errors in this case; it makes the analyst's key work product even less available for examination and scrutiny by the factfinders and the adversarial testing process. In purposefully failing to

admit the report provided by Cellmark and relied upon by Lambatos, the State attempted to sidestep Williams's constitutional right to confrontation and impermissibly bolster its evidence. Such actions undermine the criminal justice system and cast doubts on the reliability of the evidence.

The State argues that the profile developed by Cellmark and the contents of its report are reliable because Cellmark is an "accredited" lab that presumably follows appropriate procedures. *See* JA 59-60. This, too, was addressed and dismissed in *Bullcoming*. This Court found that Caylor's signed statements indicating that he had "followed the procedures set out on the reverse of th[e] report" was not enough to establish reliability and dispense with confrontation. *Bullcoming*, 131 S.Ct. at 2710. Similarly, the determination by a "certified reviewer" that Caylor "was qualified to conduct the BAC test" and that the "established procedure for handling and analyzing" had been followed did not satisfy confrontation. Thus, while Lambatos may have believed the report was reliable, that does not render it so, nor does it obviate the requirements of confrontation. As surrogate witness Razatos himself acknowledged in *Bullcoming*, "you don't know unless you actually observe the analysis that someone else conducts, whether they followed th[e] protocol in every instance." 131 S.Ct. at 2716 n.3.

In her concurring opinion in *Bullcoming*, Justice Sotomayor offered several hypothetical situations that the *Bullcoming* decision did not resolve. None of

those situations need be resolved here either, for none of them would exempt the evidence in this case from Confrontation Clause requirements. Justice Sotomayor first noted that *Bullcoming* did not decide whether an alternate purpose for a forensic science report—such as to provide Bullcoming with medical treatment—might exempt the report at issue from confrontation requirements. *Id.* at 2722 (Sotomayor, J., concurring). Obviously, the DNA profile report here is similarly not offered for any other purpose than to provide incriminating evidence against Williams.

Second, this is not a case in which confrontation requirements might be satisfied because the person testifying had "observed an analyst conducting a test" and therefore could be cross-examined about the testing. *Id.* As in *Bullcoming*, the witness here (Lambatos) did not observe the testing and "conceded on cross-examination that [s]he played no role in producing the [lab] report and did not observe any portion of [the analyst's] conduct of the testing." *Id.*; JA 60.

Third, Justice Sotomayor noted that *Bullcoming* did not decide whether an expert witness could offer "his independent opinion about underlying testimonial reports that were not themselves admitted into evidence." *Bullcoming*, 131 S.Ct. at 2722. Although the Court did not decide whether there is such an exception, if it does exist, any such exception would necessarily have to be narrower than required to permit the un-examined evidence in this case. Here, unlike in Justice Sotomayor's hypothetical, Lambatos

was not merely asked to offer an independent opinion about the DNA profile of the perpetrator extracted from the crime scene evidence, but, *assuming the profile to be accurate,* to opine about whether it matched Petitioner's, and to ascribe statistical power to that match. *See id.* (State did "not assert that [the witness] offered an independent, expert opinion about Bullcoming's blood alcohol concentration"—the precise matter determined by the non-testifying analyst).

Such an assumption verges on tautological, where the profile's accuracy is measured only by its match to Williams. The question the jury must decide, however, involves assessing whether the proper (and very human) procedures in extracting the DNA, separating it, and generating a profile were properly done in this specific instance and in a manner that could produce reliable results. To this Lambatos could offer nothing. Here, unlike in Justice Sotomayor's hypothetical, Lambatos's opinion simply was not about the profile itself or the accuracy of the testing procedures. To assume reliability of that separate, but essential, component of the State's proof in this case would be to create the exception that swallows the rule of confrontation.

The Illinois Supreme Court's decision was grounded on an Illinois rule of evidence that allows an expert witness to rely on and disclose otherwise inadmissible evidence so long as the evidence is "of a type reasonably relied upon by experts in the particular field." *Wilson v. Clark*, 417 N.E.2d 1322, 1326-27 (Ill. 1981) (adopting Fed. R. Evid. 703); JA 172.2. The

rationale behind this rule is that if the information is of a type experts rely upon in their everyday professional capacity, it is sufficiently reliable for use at trial. *Wilson*, 417 N.E.2d at 1326. The nature of the evidence here, however, was quite different than a surgeon relying on triage information to act. The forensic evidence was sent to Cellmark to build a criminal case; the State's trial expert "relied" on this evidence to buttress the State's theory of guilt. In short, it is wholly testimonial, produced for litigation, and precisely the sort of evidence that the Confrontation Clause protects against.

Finally, Justice Sotomayor noted that *Bullcoming* was "not a case in which the State introduced only machine-generated results, such as a printout from a gas chromatograph." 131 S.Ct. at 2722. Neither is this such a case. Here, the Cellmark analyst went through an extensive process to extract, quantify, amplify, separate and detect the DNA in the sample *before* using a machine to generate the electropherogram data that he or she sent to Lambatos. Data generation is not an early stage of DNA analysis, it is one of the final stages. Moreover, data is the product of the analyst, not a machine. *See* II.A., *supra*. When Cellmark sent the electropherograms to Lambatos, Cellmark made implicit assertions that it followed proper protocols and competently performed the steps that preceded data generation. The electropherograms themselves were Cellmark's explicit testimonial statements regarding the identity of the

perpetrator. Confrontation concerns are fully applicable here.

## CONCLUSION

The rights of a citizen cannot be waived by an expert. This Court should reaffirm its conclusion in *Melendez-Diaz* and *Bullcoming* that forensic reports are testimonial and require the analyst be present for cross-examination to introduce his results. *Crawford* held that "[a]dmitting statements deemed reliable by a judge is fundamentally at odds with the right of confrontation." 541 U.S. at 61. Admitting statements deemed reliable by a non-observing forensic analyst is equally at odds with the right of confrontation. The judgment of the Illinois Supreme Court should be reversed.

Respectfully submitted,

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September 7, 2011

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## APPENDIX A

The Innocence Network member organizations include the Alaska Innocence Project, Association in Defence of the Wrongly Convicted, California Innocence Project, Center on Wrongful Convictions, Committee for Public Counsel Services Innocence Program, Connecticut Innocence Project, Delaware Office of the Public Defender, Downstate Illinois Innocence Project, Duke Center for Criminal Justice and Professional Responsibility, Exoneration Initiative, Georgia Innocence Project, Griffith University Innocence Project, Hawaii Innocence Project, Idaho Innocence Project, Indiana University School of Law Wrongful Conviction Clinic, Innocence Institute of Point Park University, Innocence Network UK, Innocence Project, Innocence Project Arkansas, Innocence Project at UVA School of Law, Innocence Project New Orleans, Innocence Project New Zealand, Innocence Project Northwest Clinic, Innocence Project of Florida, Innocence Project of Iowa, Innocence Project of Minnesota, Innocence Project of South Dakota, Innocence Project of Texas, Irish Innocence Project at Griffith College, Justice Brandeis Innocence Project, Justice Project, Inc., Kentucky Innocence Project, Life After Innocence Project, Maryland Innocence Project, Medill Innocence Project, Michigan Innocence Clinic, Mid-Atlantic Innocence Project, Midwestern Innocence Project, Mississippi Innocence Project, Montana Innocence Project, Nebraska Innocence Project, New England Innocence Project, North Carolina Center on Actual Innocence, Northern

Arizona Justice Project, Northern California Innocence Project, Ohio Innocence Project, Office of the Ohio Public Defender Wrongful Conviction Project, Osgoode Hall Innocence Project, Pace Post-Conviction Project, Palmetto Innocence Project, Pennsylvania Innocence Project, Reinvestigation Project, Rocky Mountain Innocence Center, Sellenger Centre Criminal Justice Review Project, Texas Center for Actual Innocence, Texas Innocence Network, Thomas M. Cooley Law School Innocence Project, Thurgood Marshall School of Law Innocence Project, University of British Columbia Law Innocence Project, University of Leeds Innocence Project, Wake Forest University Law School Innocence and Justice Clinic, Wesleyan Innocence Project, and the Wisconsin Innocence Project.

## APPENDIX B

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July 1, 2002

Angela Petrone, Esq.
Assistant State's Attorney
State's Attorney for Cook County
2650 South California Avenue, Room 11D10
Chicago, IL 60608

Re: Cellmark Case No. ILFF01-3359

Dear Ms. Petrone:

Pursuant to your request for discovery of certain documents pertaining to the above-referenced, case, please find enclosed the following materials and/or responses.

The Illinois Supreme Court Rule 417 represents "a minimum standard for compliance concerning DNA evidence" and specifies that the "proponent of the DNA evidence, whether prosecution or defense, shall provide or otherwise make available to the adverse party all relevant materials," including the following items, denoted by the Rule 417 paragraph numbers.

Item i. Case File

CMD 1A: A copy of the case folder contents in the above-referenced case is provided at no charge. Copies of the edited STR electropherograms that Orchid Cellmark has generated and used for analysis are included in the case folder, as well as the final report, inventory and case summary, chain of custody documentation (evidence receipt form or shipping manifest), and case submission form.

CMD 1B: A copy of a slot blot is provided at no charge.

CMD 1C: A copy of documentation regarding batch amplification, gel loading, and 377 and/or 310 run information, including controls and ladders, is provided at no charge.

Item ii. Films, Strips, Photographs, Electropherograms, Tabular Data, Electronic Files, and Other Data

Note 1: All of these items except the electronic files can be found in CMD 1A-C described above.

CMD 2: Individual GeneScan sample files including allelic ladders, reagent blanks, positive, and negative controls are provided on a CD-ROM at a cost of $250. The Genotyper templates, which include the Forensic macros used at Orchid Cellmark, are also included. Copies of Genotyper printouts for samples and positive controls can be found in the case folder. Analysis

parameters are included with each sample file. Data for sizing ladders are included in the individual sample files.

Item iii. Compliance Records Related to quality Control Guidelines or Standards

Note 2: Documentation regarding quality control pertaining to the above-referenced case is included in the copy of the case folder. Additional documentation regarding quality control procedures is located in the Standard Operating Procedures Manual (see CMD 3 described below).

Note 3: If additional quality control records are required, the items requested will need to be clearly specified, and can be provided at a cost of $0.50 per photocopy and $200 per hour for time to assemble the materials.

Item iv. Manuals, Protocols, Guidelines, and Validation Studies

CMD 3: A copy of the 2001 PCR Standard Operating Procedures Manual in use at the time of analysis in the above-referenced case is provided as part of our Supplemental Discovery Package at a cost of $200.

CMD 4: Copies of all current certificates of accreditation, licensures, and permits for Orchid Cellmark consist of 12 pages and are provided at no cost as part of the Supplemental Discovery Package (see CMD 3 above).

CMD 5: A copy of the Quality Assurance Manual consists of 39 pages and is provided for $19.50 (at a cost of $0.50 per page).

Note 4: The DNA profiles generated for the case referenced above were done in compliance with "Quality Assurance Standards for Forensic DNA Testing Laboratories," prepared by the DNA Advisory Board for the Federal Bureau of Investigation (FBI). A copy of this document can be found at the following web site: http://www.fbi.ov/hq/lab/fsc/backissu/july2000/codis2a.htm

Note 5: Internal documentation regarding Fluorescent STR (COfiler/Profiler) validation studies consists of 1200 pages and can be provided for $600 (at a cost of $0.50 per page).

Note 6: Refer to the scientific literature and proceedings from scientific meetings for information regarding STR testing systems.

Note 7: For information about developmental validation, refer to Section 9, "Results and Interpretation," and Section 12, "TWGDAM Validation," in *AmpFlSTR Profiler Plus PCR Amplification Kit: User's Manual,* Applied Biosystems, Perkin-Elmer Corporation, 1998. Also refer to Section 2, "Results and Interpretation," and Section 3, "TWGDAM Validation," in *AmpFlSTR COfiler PCR Amplification Kit: User Bulletin,* Applied Biosystems, Perkin-Elmer Corporation, 1998.

Note 8: Additional information can be obtained at the following STR web site: http://www.cstl.nist.gov/biotech/strbase/str_ref.htm.

Item v. Proficiency Testing and Curricula Vitae

CMD 6: A memorandum from Mahindra Nath Varma to Mark Stolorow, Robin W. Cotton, Ph.D., Jennifer Reynolds, Ph.D., and Charlotte Word, Ph.D., dated August 13, 2001, entitled "Laboratory RFLP and PCR Proficiency Test Summaries (1988 through 2000)" consists of 12 pages and is provided for $6 (at a cost of $0.50 per page).

Note 9: Copies of the proficiency test results for the Orchid Cellmark scientists directly involved in the analysis and interpretation of the above-referenced case can be provided at a cost of $0.50 per page. It will take approximately ½ hour to assemble these documents at $200 per hour.

Note 10: Copies of the proficiency test case files for the Orchid Cellmark scientists directly involved in the analysis and interpretation of the above-referenced case can be provided for fees of $0.50 per page for photocopies, $50 per film copies, and $10 per Polaroid print copy (8 X 10). Time expended for discovery is billed at $200 per hour.

Note 11: Upon request, an estimate of the amount of material and time involved to fulfill the above request will be provided.

Note 12: Documentation regarding proficiency testing can be made available for review at Orchid Cellmark at a time mutually agreeable to defense experts and Orchid Cellmark scientists for a fee of $200 per hour, payable in advance.

CMD 7: Curricula vitae for the scientists responsible for the above-referenced case, Dr. Robin W. Cotton and Dr. Jennifer E. Reynolds; are provided at no charge as part of the Supplemental Discovery Package (see CMD 3 above).

Note 13: Information on continuing education activities can be found in the curricula vitae.

CMD 8: Job descriptions for Dr. Robin W. Cotton (Director, Technical Forensic Sciences) and Dr. Jennifer E. Reynolds (Senior Manager, Forensics and Laboratory Director) comprise 4 pages combined and are provided for $2 (at a cost of $0.50 per page).

Item vi. Discrepancies, Defects, or Errors in the Testing

Note 14: Please refer to the contents of CMD 1A-C described above.

Item vii. Chain of Custody

Note 15: Please refer to the case folder contents described in CMD 1A above.

Item viii. Method of Calculation of Statistical Probabilities

Note 16: For information on the calculation of statistical probabilities, please refer to P097, "Using DNA-VIEW to Calculate Profile Frequencies For Profiler Plus & COfiler," and P112, "Using DNA-VIEW to Calculate Mixture Statistics For Profiler Plus & COfiler Data," in the PCR Standard Operating Procedures Manual described above (see CMD 3).

Item ix. Databases

CMD 9: The PCR databases utilized by Orchid Cellmark for this case are described in the enclosed article, "Population Data on the Thirteen CODIS Core Short Tandem Repeat Loci in African Americans, U.S. Caucasians, Hispanics, Bahamians, Jamaicans, and Trinidadians," Bruce Budowle et al, *Journal of Forensic Sciences 1999,* 44(6):1277-1286. This article is provided at no charge as part of our Supplemental Discovery Package (see CMD 3 above).

Item x. Software Programs

Note 17: The commercial software used is from the Perkin-Elmer Corporation and is as follows: ABI PRISM 310 Collection, GeneScan® 3.1, and Genotyper® 2.1 or 2.5. The frequency calculation software is DNA-VIEW, by Charles H. Brenner.

Item xi. Laboratory Audits

Note 18: Copies of summaries of internal and external audits conducted in 1998 and later years consist of 236 pages and can be provided for $118 (at a cost of $0.50 per page). The six internal and 10 external audit documents may also be ordered individually (at a cost of $0.50 per page) and are as follows:

Internal Audits

1. A memorandum dated September 6, 2001, from Mahindra Nath Varma, RE: *August Laboratory Inspection* (2 pages).

2. A memorandum dated February 26, 2001, from Linda Danielsen and Mahindra Nath Varma, RE: *QC Monitoring* (12 pages).

3. A memorandum dated November 28, 2000, from Linda Danielsen, RE: *QC Monitoring* (11 pages).

4. A memorandum dated January 19, 2000, from Linda Danielsen, RE: *QC Monitoring* (11 pages).

5. A memorandum dated June 8, 1998, from Linda Danielsen, RE: *Follow up to Lab Audit memorandum, dated April 7, 1998* (13 pages).

6. A memorandum dated April 7, 1998, from Linda Danielsen, RE: *Lab Audit* (5 pages).

External Audits

1. A letter dated January 28, 2002 from Dr. Robin W. Cotton to Clement G. Smetana conveying Orchid Cellmark's response to the November 2001 DAB audit (8 pages).

2. A letter dated January 2, 2002, from Clement G. Smetana, Chief, Serology/DNA Division, U.S. Army Criminal Investigation Laboratory, describing the results of a DAB audit conducted at Orchid Cellmark in November 2001, and a copy of the audit report (53 pages).

3. A letter dated May 30, 2001, from Michael J. Wajda, Esq., Office of Health Care Quality, Maryland Department of Health and Mental Hygiene, discussing a survey of Orchid Cellmark required for the CLIA Laboratory Certificate of Compliance, and a copy of the CLIA certificate (3 pages).

4. The ASCLD/LAB Annual Accreditation Review Report dated May 7, 2001, based on Orchid Cellmark's self-evaluation and prepared by Dr. Robin W. Cotton, and an accompanying letter dated May 7, 2001, from Dr. Cotton to Ralph Keaton, Executive Director, ASCLD/LAB, with additional information and attachments (15 pages).

5. A letter dated December 22, 2000, from Teresa M. Long, Forensic Chemist Manager/Biology Section, Maryland State Police Crime Laboratory, describing the findings of a DAB audit conducted at Orchid Cellmark in December

2000, and transmitting a copy of the audit report (49 pages).

6. A letter dated July 24, 2000, from Anthony Longhetti, Chair, ASCLD/LAB, describing the 5-year accreditation of Orchid Cellmark as the result of inspections which occurred in April 2000 (2 pages).

7. A letter dated May 6, 2000, from Anthony Longhetti, Chair ASCLD/LAB, and an enclosed report of the ASCLD/LAB inspection team's visit of April 10-13, 2000 (12 pages).

8. A letter dated February 14, 2000, from George C. Li, Forensic Scientist Supervisor, Virginia Division of Forensic Science, describing the findings of a DAB audit conducted at Orchid Cellmark in January 2000, the audit report, and a reply from Dr. Robin W. Cotton to Mr. Li dated April 5, 2000 (24 pages).

9. A letter dated December 2, 1999, to Dr. Jennifer Reynolds from Jeffrey Riolo, Criminalist, Washoe County (NV) Sheriff's Office regarding Mr. Riolo's inspection of Orchid Cellmark as required by the "Quality Assurance Standards for Convicted Offender DNA Databasing Laboratories," and a copy of the audit report (10 pages).

10. A letter dated December 2, 1998, from Christine S. Tomsey, Forensic DNA Laboratory Manager, Pennsylvania State Police, and an enclosed audit report based on an audit conducted at Orchid Cellmark in November 1998 (6 pages).

It is our understanding that the enclosed documents and/or above responses represent full compliance with the request for discovery in the above-referenced case. If this is incorrect, please notify us as soon as possible.

If you forward copies of the enclosed materials to other counsel, please keep the documents organized in the same order as you received them. All discovery fees are payable in advance unless other invoicing arrangements are previously approved. A charge will be included for processing (see enclosed discovery fee schedule) and shipping. If you have any questions or need additional information, please call the scientists involved in the above-referenced case (800-872-5227) or me at 301-515-6125.

These materials and/or responses are being provided on behalf of the Forensic Laboratory Director, Robin W. Cotton, Ph.D.

Sincerely,

/s/ Donald G. Fowles
Donald G. Fowles
Discovery Coordinator

Enclosures

cc: Robin Cotton/casefile
Dr. Pam Fish

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