No. 10-8505
In the Supreme Court of the United States

SANDY WILLIAMS,

Petitioner,

v.

ILLINOIS,

Respondent.

ON WRIT OF CERTIORARI TO THE SUPREME COURT OF ILLINOIS

BRIEF OF THE STATE OF OHIO, 41 OTHER STATES, THE DISTRICT OF COLUMBIA, AND GUAM AS *AMICI CURIAE* IN SUPPORT OF RESPONDENT

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QUESTION PRESENTED

Whether the testimony of an expert witness satisfies the Confrontation Clause of the Sixth Amendment where the witness testifies to her own independent opinions, without introducing any underlying testimonial sources for their truth, and a criminal defendant has an opportunity to cross-examine the witness.

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INTRODUCTION

This Court has already made clear that criminal defendants have a right to determine the reliability of witnesses in one particular way—confrontation through cross-examination. *Crawford v. Washington*, 541 U.S. 36, 54 (2004). But the Court has yet to resolve how the rule applies to expert witnesses. Courts have divided on the question because experts are by definition unlike other witnesses: To render an opinion, expert witnesses draw on expertise derived from many sources (including statements from other experts in their field), and most, if not all, of those sources never appear in the courtroom.

Cross-examining the testifying expert has long been regarded as an effective mechanism for challenging both the expert's testimony and those underlying sources of information. See generally Tal Golan, *Laws of Men and Laws of Nature: The History of Scientific Expert Testimony in England and America* 259 (2004). And this is generally sufficient to satisfy the Sixth Amendment Confrontation Clause. No confrontation violation occurs when an expert renders an independent opinion, even if it is based on underlying testimonial sources; a defendant only has a confrontation right as to the underlying testimonial sources if the prosecution introduces that evidence for its truth at trial.

STATEMENT OF AMICI INTEREST

The Amici have a direct interest in the outcome of this appeal. This Court's decisions in *Melendez-Diaz v. Massachusetts*, 129 S. Ct. 2527 (2009) and *Bullcoming v. New Mexico*, 131 S. Ct. 2705 (2011), changed how the States present scientific evidence in a criminal trial. A State cannot introduce testimonial scientific evidence without the testimony of a live witness. See *Melendez-Diaz*, 129 S. Ct. at 2532. And if an expert's opinion is presented for its truth at trial, then a defendant has a right to confront that expert. See *Bullcoming*, 131 S. Ct. at 2710. Notwithstanding those guidelines, uncertainty remains about how the States can present scientific evidence at trial.

Petitioner and his amici have mounted a Confrontation Clause attack on expert testimony based in part on scientific testing performed by others. The States have a profound interest in this Court ensuring that they can continue to introduce the opinions of qualified scientific experts at trial without running afoul of a defendant's confrontation rights.

SUMMARY OF ARGUMENT

In-court testimony from a qualified expert who renders an independent opinion about forensic evidence—without introducing underlying testimonial sources for their truth—satisfies the Confrontation Clause as long as a defendant has the opportunity to cross-examine the expert.

The courts have never required prosecutors to introduce all sources upon which an expert relied to form her opinion. A defendant has the right to confront the source of underlying materials only if they are testimonial *and* introduced for their truth. Cross-examination of a testifying expert otherwise allows a defendant to expose any weaknesses in the expert's opinion or her underlying data, and also to question the witness's training and experience.

Moreover, even if the Court construed the Confrontation Clause to guarantee a right to confront the sources of all testimonial evidence underlying an expert's opinion, not all of these underlying sources—and not all scientific data—are testimonial. Like much material underlying expert opinions, an electropherogram and other machine-generated data are simply not testimonial evidence.

Accordingly, there is no reason to adopt the rule Williams advocates here.

ARGUMENT

A. A defendant's confrontation rights are not violated by in-court testimony from a qualified expert who renders an independent opinion about forensic evidence when the defendant has an opportunity to cross-examine the expert witness.

No confrontation violation occurs where, as here, a scientific expert testifies about her own opinions—formed after reviewing data generated by another individual—and that expert is available for cross-examination.

1. This case differs significantly from *Melendez-Diaz* and *Bullcoming*.

The key differences between this case and *Melendez-Diaz* and *Bullcoming* are straightforward. Here, a forensic expert testified live, in court, about her own independent conclusions, and was subject to cross-examination about how and why she reached those conclusions. See *People v. Williams*, 939 N.E.2d 268, 272 (Ill. 2010). Unlike *Melendez-Diaz* or *Bullcoming*, there is no question that Williams was able to confront the witness against him.

In *Melendez-Diaz*, no one testified about forensic test results that the prosecution relied on to prove that substance seized from the defendant contained cocaine. 129 S. Ct. at 2530-31. Instead, the prosecution introduced only affidavits by State employees who had tested and analyzed the substance in preparation for trial. *Id.* Because these affidavits fell within the "'core class of testimonial statements,'" the introduction of this evidence

required live witness testimony. *Id.* at 2532; see also *id.* at 2543 (Thomas, J., concurring).

In *Bullcoming*, the prosecution did present live witness testimony to accompany its forensic evidence, but the witness served merely as a conduit for *another* analyst's opinion set out in a formal lab report. The State sought to introduce a state laboratory employee's testimony about a certified laboratory report containing the raw results—and conclusions—from a blood alcohol test. 131 S. Ct. at 2709-10, 2712. But the live witness had not performed or witnessed the testing, and he offered no independent scientific opinions. *Id.* at 2710, 2716; see also *id.* at 2722 (Sotomayor, J., concurring) ("[A]side from reading a report that was introduced as an exhibit, Mr. Razatos offered no opinion about Petitioner's blood alcohol content." (internal quotation and citation omitted)). He was merely a conduit for *someone else's opinion*—the absent analyst who *had* formed conclusions and generated a report about the data. *Id.* at 2715-16. Such testimony does not satisfy the Confrontation Clause. *Id.* at 2716.

In this case, Illinois satisfied the requirements of *Melendez-Diaz* and *Bullcoming*—and, more broadly, the requirements of the Confrontation Clause. Compare *Williams,* 939 N.E.2d at 281-82, with *Melendez-Diaz*, 129 S. Ct. at 2531-32, and *Bullcoming*, 131 S. Ct. at 2717. The State did not seek to rely on formal certifications, by affidavit or otherwise. Compare *Williams,* 939 N.E.2d at 281-82, with *Bullcoming*, 131 S. Ct. at 2707; *Melendez-Diaz*, 129 S. Ct. at 2543 (Thomas, J., concurring). Rather, the State offered in-court expert testimony and the

witness was subject to cross-examination. *Williams,* 939 N.E.2d at 272. And unlike the witness in *Bullcoming*, the testifying expert here was rendering her *own independent opinion.* Compare *id*. at 271-72, 275, with *Bullcoming*, 131 S. Ct. at 2722 (Sotomayor, J., concurring).

2. The opportunity to cross-examine an expert witness who testifies to her own opinion satisfies a defendant's confrontation rights.

Admissibility of an expert's opinions has never been predicated on an opportunity to cross-examine anyone other than the witness herself. As this Court has explained, "the Confrontation Clause is generally satisfied when the defense is given a full and fair opportunity to probe and expose . . . infirmities [in an expert's testimony] through cross-examination." *Delaware v. Fensterer*, 474 U.S. 15, 22 (1985); see also *United States v. Wade*, 388 U.S. 218, 227-28 (1967) (holding, in the context of the Sixth Amendment right to counsel, that that when it comes to blood tests, "the accused has the opportunity for a meaningful confrontation . . . through the ordinary processes of cross-examination of the . . . expert witnesses").

The ability to cross-examine a testifying expert satisfies the Confrontation Clause for the same reasons that expert testimony is admissible in the first place. By definition, an expert's opinion is useful because she is able to draw on her training, her experience, and data from others in her field. As long as an expert renders an independent opinion based on these sources, there is no constitutional

problem. See, e.g., *Dura Auto. Sys. of Ind., Inc. v. CTS Corp.*, 285 F.3d 609, 612 (7th Cir. 2002).

For example, in the context of DNA testing, technicians regularly "perform largely mechanical or ministerial tasks" at the early stages of the testing process.[1] *United States v. Boyd*, 686 F. Supp. 2d 382, 384 (S.D.N.Y. 2010), affirmed 401 Fed. Appx. 565 (2d Cir.), cert denied 131 S. Ct. 1618 (2011). But a well-trained, qualified DNA analyst can identify errors that occurred when processing a DNA sample by examining the face of an electropherogram (a graph depicting DNA). *Williams*, 939 N.E.2d at 279-80.

When a defendant cross-examines a testifying expert, he can inquire both about the expert's own conclusions *and* her justifications for relying on specific information—such as the preliminary work of a lab technician—to form her opinions. See, infra, Part D.2. "The vital questions—was the lab work done properly? what do the readings mean?—can be put to the expert on the stand." *United States v.*

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[1] Even though many individuals may play a role in preparing, testing, and reviewing a single forensic sample, courts frequently refer to participants in any of these activities as "analysts." Courts also use the term "results" imprecisely to refer to machine-generated data produced by a scientific test, an analyst's conclusions and opinions about that data, or both. This imprecise language has exacerbated confusion about when scientific evidence is constitutionally admissible. See *Melendez-Diaz*, 129 S. Ct. at 2546 (Kennedy, J., dissenting) ("[T]he Court cannot define with any clarity who the analyst is."). Properly defined, a lab technician who inserts a sample into an instrument—and does nothing more—is not an "analyst." "Analyst" refers only to an individual who exercises her own judgment to evaluate scientific data and reaches her own conclusions about its meaning.

Moon, 512 F.3d 359, 362 (7th Cir. 2008) (explaining that the background data need not be presented to the jury for cross-examination to be effective). Likewise, cross-examination can reveal any other errors, omissions, lapses in memory, or gaps in an expert's knowledge, *Fensterer*, 474 U.S. at 22, thus allowing the defendant to expose any flaws in the expert's analysis or the underlying data. See David H. Kaye et al., *The New Wigmore: Expert Evidence* § 4.6.1(c) (2d ed. 2011) ("*The New Wigmore*") ("[I]f an expert does not have enough knowledge to distinguish [reliable data from unreliable] he has no business relying on it."). Ultimately, questions about the basis for an expert's opinion speak to the weight of the expert's testimony, not to its admissibility. *Fensterer*, 474 U.S. at 22.

By contrast, the Confrontation Clause may be violated where the testifying expert is merely a conduit for *someone else's* opinion. In that situation, *Bullcoming* made clear that a defendant has a right to confront the declarant who actually formed the opinion.

In short, this Court's precedents regarding expert witnesses, read together with *Melendez-Diaz* and *Bullcoming*, confirm that Williams's confrontation rights were not violated here. A defendant has the right to confront and cross-examine any witnesses against him; here, the testifying expert was that witness and Williams had that opportunity.

B. The Constitution does not guarantee defendants a right to confront the sources upon which a testifying expert bases her opinion.

Because there is no doubt that Williams had the opportunity to confront and cross-examine the expert witness who analyzed the machine-generated data and testified about her conclusions at trial, the only remaining question is whether the Sixth Amendment also guarantees Williams an opportunity to confront the individuals who helped generate that underlying data. It does not.

1. Experts have long testified to opinions formed after considering otherwise inadmissible materials.

This Court has never recognized a constitutional right to confront the underlying source of material that an expert witness considers before forming an opinion. See *Bullcoming*, 131 S. Ct. at 2722 (Sotomayor, J., concurring); see also *Fensterer*, 474 U.S. at 19-20 (no confrontation violation when testifying expert cannot remember what materials were relied on to form an opinion).

Accordingly, courts have long permitted experts to *rely* on hearsay—even though hearsay itself is not otherwise admissible. See John Henry Wigmore, A Pocket Code of the Rules of Evidence in Trials at Law § 408, at 118 (1910) (expert allowed to rely on hearsay when "using the reported data of fellow scientists"); *Spiller v. Atchison, T. & S.F.R. Co.*, 253 U.S. 117, 130 (1920) (witness's testimony based on hearsay was accepted "very much as the testimony of an expert witness might have been

accepted"); see also *Daubert v. Merrell Dow Pharms.*, 509 U.S. 579, 592 (1993) ("[A]n expert is permitted wide latitude to offer opinions, *including those that are not based on firsthand knowledge or observation.*" (emphasis added)).

For example, experts have long been allowed to rely on hearsay for opining on medical (particularly psychiatric) diagnoses or about property valuation. See e.g., *Birdsell v. United States*, 346 F.2d 775, 779 (5th Cir. 1965) (medical diagnosis); *Fitts v. United States*, 328 F.2d 844, 847 (10th Cir. 1964) (same); *Jenkins v. United States*, 307 F.2d 637, 641 (D.C. Cir. 1962) (same); *Nat'l Bank of Commerce v. New Bedford*, 56 N.E. 288, 290 (Mass. 1900) ("An expert may testify to [property] value although his knowledge of details is chiefly derived from inadmissible sources, because he gives the sanction of his general experience. But the fact that an expert may use hearsay as a ground of opinion does not make the hearsay admissible."); *United States v. Williams*, 447 F.2d 1285, 1289-92 (5th Cir. 1971) (property valuation); *H. & H. Supply Co. v. United States*, 194 F.2d 553, 555-56 (10th Cir. 1952) (same); *United States v. 5139.5 Acres of Land*, etc., 200 F.2d 659, 662 (4th Cir. 1952) (same).

Since 1975, experts of all stripes have been allowed to rely on hearsay. The Federal Rules of Evidence (and analogous state evidentiary rules) authorize "expert opinions based on otherwise inadmissible hearsay" as long as the facts or data relied on meet the additional requirements of that rule. *Daubert*, 509 U.S. at 595; see also *United States v. Gresham*, 118 F.3d 258, 266 (5th Cir. 1997) ("[I]t is axiomatic that expert opinions may be based

on facts or data of a type reasonably relied upon by experts in a particular field, even if the sources are not admissible evidence."). Accordingly, scientific experts may rely on data generated by other scientists to form their opinions, even if the data itself would constitute hearsay.

2. *Crawford* and its progeny did not invalidate the rules for expert testimony or the permissible bases for expert opinions.

Crawford altered the manner in which hearsay evidence itself is evaluated under the Confrontation Clause, but it did not change the laws or rules governing expert witness testimony. Indeed, *Crawford* makes no mention of experts, see generally 541 U.S. 36, and the Court has not subsequently restricted the material experts may rely on. See *United States v. Winston*, 372 Fed. Appx. 17, 19-20 (11th Cir. 2010) ("Although *Melendez-Diaz* discusses when a forensic opinion may be admitted into evidence, [it does not] . . . address[] whether an expert witness's testimony that is based on a forensic opinion prepared by a non-testifying expert, in addition to other evidence, violates a defendant's right to confrontation."); see also *United States v. McGhee*, 627 F.3d 454, 460 (1st Cir. 2010) (in part, distinguishing *Melendez-Diaz* because it did not preclude experts from relying on data generated by other experts).

In the wake of *Crawford*, many courts have held that the Confrontation Clause is satisfied when experts offer opinions based on hearsay evidence, as long as the underlying hearsay is not introduced for its truth. See, e.g., *United States v. Turner*, 591 F.3d

928, 933 (7th Cir. 2010); *United States v. Henry*, 472 F.3d 910, 914 (D.C. Cir. 2007); *United States v. Mirabal*, No. 09-3207, 2010 U.S. Dist. Lexis 91595, *20-22 (D.N.M. Aug. 7, 2010); *Commonwealth v. Avila*, 912 N.E.2d 1014, 1029 (Mass. 2009); *Wood v. State*, 299 S.W.3d 200, 213 (Tex. App. Ct. 2009) ("[T]he Confrontation Clause is not violated merely because an expert bases an opinion on inadmissible testimonial hearsay. The testifying expert's opinion is not hearsay, and the testifying expert is available for cross-examination regarding his opinion."); see generally *The New Wigmore* § 4.10.2. These opinions harmonize the Confrontation Clause and the rules of expert testimony, explaining that "*Crawford* forbids the introduction of testimonial hearsay as evidence in itself, but it in no way prevents expert witnesses from offering their independent judgments merely because those judgments were in some part informed by their exposure to otherwise inadmissible evidence." *United States v. Johnson*, 587 F.3d 625, 635 (4th Cir. 2009). Under *Crawford*, "the question . . . is whether the expert '"applied his expertise to [testimonial] statements but did not directly convey the substance of the statements to the jury."' *United States v. Mejia*, 545 F.3d 179, 198 (2d Cir. 2008) (quoting *United States v. Lombardozzi*, 491 F.3d 61, 73 (2d Cir. 2007)).

In this case, the State did not introduce any of the underlying hearsay evidence at trial. *Williams*, 939 N.E.2d at 272 (expert "testified to her conclusion informed by Cellmark's report, Cellmark's report itself was not introduced into evidence"). Nor did the testifying expert communicate the substance of anyone else's conclusions. See *id.* at 279 (expert only "testified to her conclusion based upon her own

subjective judgment about the comparison of the Cellmark report with the existing . . . profile" in the Illinois State Patrol database, which contains thousands of DNA profiles generated by others).[2] The facts of this case conform to well-settled law governing the permissible basis for expert opinion: A testifying expert may rely on data prepared by others, but she must offer her own independent opinion of that data.

C. Even if the Confrontation Clause guaranteed the right to confront the underlying sources of testimonial evidence upon which an expert opinion is based, electropherograms are not testimonial.

Even if the Court finds a constitutional right to confront the underlying sources of testimonial evidence upon which an expert opinion is based, the electropherograms at issue in this case, like most machine-generated data, are not testimonial.

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[2] At least one of Williams's Amici suggests that the prosecution's expert *did* testify about conclusions reached by others. See Friedman Amicus Br. at 12 n.6. In fact, the expert's *only* statements about what Cellmark employees did were elicited by the defense on cross-examination and do not implicate the Confrontation Clause. See *Diaz v. United States*, 223 U.S. 442, 452-53 (1912) (where the accused placed testimony in evidence, "he waived his right of confrontation as to that testimony and cannot now complain of its consideration").

Contrary to the Amici's suggestion, the expert here repeatedly testified that she performed her own analysis and that her approach differed from Cellmark's. See Joint Appendix ("J.A.") at 62, 81, 83-85. She also expressly disclaimed reliance on Cellmark's conclusions. *Id.* at 84.

Melendez-Diaz and *Bullcoming* recognize that many aspects of the forensic process are nontestimonial, *Melendez-Diaz*, 129 S. Ct. at 2532 n.1; *Bullcoming*, 131 S. Ct. at 2721 n.2 (Sotomayor, J., concurring). But the Court has not specifically described the line between testimonial and non-testimonial scientific evidence. The Court should use this case to decide "whether . . . a State could introduce (assuming an adequate chain of custody foundation) raw data generated by a machine in conjunction with the testimony of an expert witness." *Bullcoming*, 131 S. Ct. at 2722 (Sotomayor, J., concurring). And it should rule that such "raw data"—here, a machine-generated electropherogram—is not testimonial.

It is beyond dispute that not all scientific evidence is testimonial. On one end of the spectrum, blood pumping through an individual's veins is non-testimonial. And, on the other end of the spectrum, a formal forensic lab report analyzing a blood sample and opining about its source are clearly testimonial. But where is the line between nontestimonial physical or scientific evidence and testimonial analysis of that evidence? The Court should draw that line here as follows: An electropherogram is nontestimonial, but an expert's *interpretation* of that electropherogram is testimonial.

An electropherogram is a visual representation of physical blood evidence—it puts a blood sample into a form that an expert can interpret. The process by which that occurs is a mechanical one. The machine's output reflects the current condition of a sample; someone has to interpret that data to link it to a particular

individual or a particular set of facts. See *United States v. Washington*, 498 F.3d 225, 232 (4th Cir. 2007) (expert testimony necessary to link machine-generated data to defendant). An electropherogram then is nothing more than a nontestimonial product of a mechanical process. See *United States v. Darden*, 656 F. Supp. 2d 560, 563 (D. Md. 2009) (only information relied on by the testifying expert to determine blood alcohol level was "printed data generated by the testing machines"); *People v. Brown*, 918 N.E.2d 927, 931 (N.Y. 2009) (machine-generated graphs, charts and numerical data not testimonial). The lab technician who operates a machine that generates an electropherogram is not in any privileged position to interpret the data. *Washington*, 498 F.3d at 230 (same interpretation of machine-generated data would be required for a lab technician or an expert to opine about whether drugs were present in a blood sample). Sometimes a lab analyst will interpret the data and memorialize it in a report. But an independent expert could also look at the machine-generated data, interpret it, and offer an opinion about it.

Without an expert's specialized skill and knowledge, much scientific data would mean little to a trier of fact. And that is especially true in the context of DNA analysis. Before a DNA sample is analyzed, it undergoes a process called electrophoresis. During this process, a sample is exposed to an electrical field that separates out DNA fragments. *Williams*, 939 N.E.2d at 271. The end result is an electropherogram, a document resembling a line graph, with peaks representing the lengths of the DNA strands at 13 specific locations. *Id.* A DNA analyst then reviews the

electropherogram and prepares a report interpreting the machine-generated data.

Accordingly, when the prosecution relies on DNA-based identification at a criminal trial, the relevant question is not what is *on* the graph, but what the graph *means*. "[T]he mere fact that the characteristics of certain alleles of a defendant's DNA matches the characteristics of alleles of DNA found at a crime scene says almost nothing about the likelihood that the defendant was present at the crime scene unless the jury learn from an expert about the nature of the DNA profile used." *Commonwealth v. Barbosa*, 933 N.E.2d 93, 109 (Mass. 2010); *Moon*, 512 F.3d at 362 (question of what a machine's readings mean can be put to an expert on the stand). Absent the value added by an *interpretation* of machine-generated data—that is, an expert's opinion—an electropherogram is meaningless to all but the mostly highly trained judges and jurors.

Concluding that an electropherogram—unadorned, machine-generated data—is nontestimonial, is also consistent with earlier holdings about the human body as a source of evidence. In the context of analyzing the Fifth Amendment's prohibition of self-incriminating testimony, the Court has classified blood, and blood test evidence, as physical (not testimonial) evidence.[3]

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[3] *Fellers v. United States*, 540 U.S. 519, 523-25 (2004), distinguished the scope of the Sixth Amendment right to counsel and the Fifth Amendment prohibition on compelled incrimination, but it did not decide whether testimony, and testimonial statements, should be similarly construed in these contexts.

In *Schmerber v. California*, 384 U.S. 757, 765 (1966), the Court held that "blood test evidence, although an incriminating product of compulsion, was neither petitioner's testimony nor evidence relating to some communicative act or writing by the petitioner." See also *Gilbert v. California*, 388 U.S. 263, 267 (1967) (stating that the "body itself" is an identifying physical characteristic outside the Fifth Amendment's protection); *Holt v. United States*, 218 U.S. 245, 252-53 (1910) (Fifth Amendment "is a prohibition of the use of physical or moral compulsion to extort communications from [a defendant]" and "not an exclusion of his body as evidence when it may be material").

Relying on *Schmerber*, lower courts have unanimously held that the "[t]he extraction of DNA doesn't implicate the privilege against self-incrimination because DNA samples are 'physical' evidence, not 'testimonial' evidence." *Wilson v. Collins*, 517 F.3d 421, 431 (6th Cir. 2008) (quoting *United States v. Zimmerman,* 514 F.3d 851, 855 (9th Cir. 2007)); see also *Boroian v. Mueller*, 616 F.3d 60, 67-68 (1st Cir. 2010); *Kaemmerling v. Lappin*, 553 F.3d 669, 685-86 (D.C. Cir. 2008); *United States v. Hook*, 471 F.3d 766, 773-74 (7th Cir. 2006); *Boling v. Romer*, 101 F.3d 1336, 1340 (10th Cir. 1996); *United State v. Appleby*, 221 P.3d 525, 551-52 (Kan. 2009). And because an electropherogram is nothing more than a graphic representation—generated by a machine—of that DNA sample, the same reasoning should extend to the treatment of electropherograms under the Confrontation Clause.

Because it is nontestimonial, any questions about the validity of an electropherogram go to

weight, not admissibility. See *United States v. Rodriguez*, 409 Fed. Appx. 866, 870-71 (6th Cir. 2011) (unpublished) (allowing fingerprint expert to offer an opinion about identity, even though he never examined the source of the original fingerprint), *cert. denied*, 180 L. Ed. 2d 259; see also *United States v. Lauder*, 409 F.3d 1254, 1262-66 (10th Cir. 2005) (same); *State v. Anderson*, 687 S.E.2d 35, 38-41 (S.C. 2009) (same); *State v. Foreman*, 954 A.2d 135, 161-62 (Conn. 2008) (same). As long as there is an "adequate chain of custody foundation,"[4] the

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[4] Prosecutors have considerable discretion "to decide what steps in the chain of custody are so crucial as to require evidence; but what testimony *is* introduced must (if the defendant objects) be introduced live." *Melendez-Diaz*, 129 S. Ct. at 2532 n.1. Although the underlying electropherograms were not introduced in this case, the prosecution introduced chain of custody evidence to support the expert's reliance on the data.

In live testimony, the expert explained that the Illinois state crime lab regularly sends evidence samples to Cellmark, an out-of-state lab. J.A. 49. She further testified that, in keeping with normal lab practices, the samples were sent and returned in sealed condition via Federal Express, and the state lab kept records of the shipping manifests. J.A. 50-51.

The prosecution also introduced the relevant shipping manifests at trial. The fact that the manifests were not introduced through live testimony does not pose a confrontation problem because, even though they were offered to prove chain of custody, they did not provide prima facie evidence against Williams and they are not within the "'core class of testimonial statements.'" *Melendez-Diaz*, 129 S. Ct. at 2532. In short, shipping manifests are akin to "documents prepared in the regular course of equipment maintenance," i*d.* at n. 1, and can be introduced without live testimony.

Although there were gaps in the prosecutor's chain of custody evidence, this goes to the weight of the evidence, not its

prosecution can introduce electropherograms as "raw data generated by a machine in conjunction with the testimony of [its] expert witness." *Bullcoming*, 131 S. Ct. at 2722 (Sotomayor, J., concurring).

D. Existing evidentiary mechanisms—including cross-examination of a testifying expert—effectively address any concerns about science in the courts.

In spite of the above analysis, Williams urges the Court to extend the Confrontation Clause because forensic science "is not immune from distortion and manipulation." Williams Br. at 30. It is true, forensic science can sometimes be "an imperfect and human endeavor," *United States v. Bonner*, 648 F.3d 209, 215 (4th Cir. 2011). But courts already have the tools for addressing these concerns. See *The New Wigmore* at xxi (expert's methodology is "subject to the trial judge's scrutiny and exclusion," "[t]he range of evidence on which

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admissibility. *Id.* To establish a chain of custody, a prosecutor "need only prove a rational basis from which to conclude that the evidence is what the party claims it to be." *United States v. Rawlins*, 606 F.3d 73, 82 (3d Cir. 2010) (internal quotations omitted); see also *United States v. Meija*, 597 F.3d 1329, 1336 (D.C. Cir. 2010) ("[T]he standard of proof requires only evidence from which the trier could reasonably believe that an item still is what the proponent claims it to be" (quoting Kenneth S. Broun et al., 2 *McCormick on Evidence* § 213 (6th ed. 2009).). Finally, there is a presumption that the officials had custody of the evidence discharged their duties properly. See *United States v. Prieto*, 549 F.3d 513, 524 (7th Cir. 2008). Because the State's chain of custody evidence would have been adequate to introduce the electropherograms themselves into evidence, it was also sufficient to support the expert's reliance on the electropherograms.

experts may rely is not unlimited," and "[c]ertain types of opinions . . . are out of bounds").

1. Trial courts are effective gatekeepers of scientific evidence.

Beginning in 1975, American courts broadly authorized expert reliance on hearsay evidence, *Daubert*, 509 U.S. at 588, while simultaneously enhancing the trial judge's role as a gatekeeper of science in the courtroom. See Fed. R. Evid. 702 & 703; see also 29 Wright & Gold, Federal Practice and Procedure: Evidence § 6261 (1997) ("Most state versions of Rule 702 are identical to the federal provision"; describing state counterparts); *id.* § 6271 ("Most state versions of Rule 703 are identical to the federal provision"; describing state counterparts).

Federal Evidence Rule 702 and its state counterparts permit expert testimony if the expert's "scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue." See also Fed. R. Evid. 702 advisory committee's note (1975) ("An intelligent evaluation of facts is often difficult or impossible without the application of some scientific, technical, or other specialized knowledge."); *Daubert*, 509 U.S. at 592 (experts possess specialized "scientific knowledge that . . . will assist the trier of fact to understand or determine a fact in issue").

Federal Evidence Rule 703 then identifies the proper "bases of opinion testimony by experts," including "facts or data . . . perceived by or made known to the expert at or before the hearing." As long as those facts or data are "of a type reasonably relied upon by experts in the particular field in

forming opinions or inferences upon the subject, [they] need not be admissible in evidence." *Id.*; see also Fed. R. Evid. 705 (allowing an expert to testify to her opinion "without first testifying to the underlying facts or data"). In short, experts have "wide latitude to offer opinions, including those that are not based on firsthand knowledge or observation." *Daubert*, 509 U.S. at 592

Even as these rules confirmed that expert testimony could be based on otherwise inadmissible evidence, they also enhanced trial judges' gatekeeping responsibilities. See *Kuhmo Tire Co. v. Carmichael*, 526 U.S. 137, 152 (1999) (discussing "*Daubert*'s gatekeeping requirement"); *Daubert*, 509 U.S. at 597; see also *Golan*, *supra,* at 263 ("[T]he twentieth-century trial judge became an active gatekeeper.").

For instance, a trial judge cannot admit expert testimony unless the expert satisfies the threshold requirements of Rule 702. First, the evidence must be relevant, meaning that it "will assist the trier of fact to understand the evidence or to determine a fact in issue." Fed. R. Evid. 702. Second, the witness must be "qualified as an expert by knowledge, skill, experience, training, or education." *Id.* Finally, the court must evaluate the expert's evidence with an eye toward three factors: whether "(1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case." *Id.*; see also *Daubert*, 509 U.S. at 593-94 (directing courts to consider factors like testing, peer review, error rates, and acceptability in the relevant

scientific community); *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923) (admitting expert opinions based on scientific technique only if the technique has been generally accepted as reliable in the scientific community).[5]

In practice, this means that courts regularly conduct *Daubert* (or *Frye*) hearings to determine whether an expert's testimony is admissible. See Weinstein's *Federal Evidence* § 702.02[2] (2d. ed. 2011) ("The admissibility of expert testimony is often decided after a separate hearing."). These hearings can be lengthy and involved, see, e.g., *United States v. Mitchell*, 365 F.3d 215, 222 (3d Cir. 2004), and they provide ample opportunity for a defendant to challenge either an expert's qualifications or the basis for her opinion before that expert's testimony is admitted.

Trial courts also have to decide whether the facts and data relied upon to form an opinion are "of a type reasonably relied upon by experts in the particular field."[6] Fed. R. Evid. 703. Courts

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[5] Although most States apply the *Daubert* test (and the Federal Rules of Evidence incorporate this standard), a handful of States continue to apply the *Frye* standard.

[6] Rule 703 also contemplates that experts themselves provide an additional check against untrustworthy scientific evidence. If an expert is qualified under Rule 702, the Rules presume that she knows what sort of evidence is sufficiently trustworthy to use as a basis for her opinion: The expert is "assumed to have the skill to properly evaluate the hearsay, giving it probative force appropriate to the circumstances." *United States v. Locascio*, 6 F.3d 924, 938 (2d Cir. 1993) (internal quotation omitted); see also *United States v. Dukagjini*, 326 F.3d 45, 57 (2d Cir. 2002).

routinely evaluate forensic data for error, confusion, or contamination. See, e.g., *United States v. McFadden*, 458 F.2d 440, 441 (6th Cir. 1972) ("[P]hysical evidence is admissible where the possibilities of misidentification or alteration are 'eliminated, not absolutely, but as a matter of reasonable probability'" (quoting *Gass v. United States*, 416 F.2d 767, 770 (D.C. Cir. 1969)); see also Fed. R. Evid. 901; *United States v. Mendel*, 746 F.2d 155, 166-67 (2d Cir. 1984); *United States v. Patterson*, 277 F.3d 709, 713 (4th Cir. 2002) (fingerprints admissible because "[a]n adequate foundation was provided . . . by 'internal patterns[] or other distinctive characteristics, taken in conjunction with circumstances." Fed. R. Evid. 901(b)(4)"); *Lauder*, 409 F.3d at 1264-65 (same); *United States v. Garcia*, 452 F.3d 36, 41 (1st Cir. 2006) (fingerprint card admissible because there was "sufficient evidence before the district court to warrant a reasonable person in believing that [the exhibit] was what it purported to be"). If a court finds substantial inaccuracies in the underlying facts and data, an expert's entire opinion may be inadmissible. Weinstein's *Federal Evidence* § 703.05[1] (noting that if inaccuracies are not substantial, an expert may testify and the defendant can identify those weaknesses at trial).

Even after these threshold determinations, the trial court continues to actively manage expert witnesses and the introduction of scientific evidence at trial.

During a trial, a court may be called on to determine whether testimony is within the scope of a witness' expertise, rule on defense objections, and

determine whether or not to admit otherwise inadmissible facts and data to show the basis for the expert's opinion. See Fed. R. Evid. 703 (requiring courts to determine whether the probative value of evidence exceeds its prejudicial effect, as under Rule 403); Fed. R. Evid. 705 (permitting disclosure of underlying data either before or after an expert testifies). If the court does admit underlying hearsay, it may need to provide a limiting instruction, directing the jury to consider the evidence only for the purpose of determining the weight of the expert's opinion. See Fed. R. Evid. 703 advisory committee's note (2000) (noting that the court must give an appropriate limiting instruction upon request).

2. Cross-examination of a testifying expert also provides effective checks on scientific evidence.

In addition to the trial courts' gatekeeping functions, a scientific expert is still subject to scrutiny even after the court decides to allow her testimony. This happens chiefly through the adversarial process. "Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence." *Daubert*, 509 U.S. at 596. "These conventional devices . . . are the appropriate safeguards" for scientific testimony that passes Rule 702. *Id.*

Cross-examination of a testifying expert means that the defendant is able to "probe and expose [any] infirmities" in an expert's testimony. *Fensterer*, 474 U.S. at 22.

First, the defendant can point to any deficiencies with the witness, highlighting any gaps in the expert's experience or the expert's reliance on data outside her direct personal knowledge. For example, a defendant could expose that an expert's opinion is derived from the results of testing that she did not conduct or observe. Cf., *e.g.*, *Williams*, 447 F.2d at 1289-90 (describing "intens[e]" cross-examination of expert in property valuation focused on probing the authenticity and accuracy of the sources on which he relied). In this way, defendants have "the opportunity to test the experts' 'honesty, proficiency, and methodology' through cross-examination." *Johnson*, 587 F.3d at 635 (quoting *Melendez-Diaz*, 129 S. Ct. at 2538).

Second, the defendant can use cross-examination to poke holes in the information upon which the expert relied. Discovery rules, along with the prosecution's constitutional obligations under *Brady v. Maryland*, 373 U.S. 83 (1963), ensure that defendants have access to this information before trial, giving them an opportunity to adopt a strategy for attacking the underlying data. See Weinstein's *Federal Evidence* § 703.05[1]. The defense can highlight any weaknesses in those underlying facts and assumptions even without introducing the data. See, e.g., *Appleby*, 221 P.3d at 552 ("These experts were available for cross-examination and their opinions could be tested by inquiry into their knowledge or lack of knowledge regarding the data that formed the basis for their opinion."); *Stecyk v. Bell Helicopter Textron, Inc.*, 295 F.3d 408, 414 (3d Cir. 2002) (explaining that the rules of evidence expressly "place[] the burden of exploring the facts and assumptions underlying the testimony of an

expert witness on opposing counsel during cross-examination").

Third, if the prosecution has not already introduced the underlying evidence, the defendant can seek to undermine an expert's testimony by introducing that information. See Fed. R. Evid. 705 ("The expert may in any event be required to disclose the underlying facts or data on cross-examination."). In this way, a defendant can call into question not only the expert's final opinions, but the very bases for them.

Fourth, the defendant can introduce his own expert to testify about the same information as the prosecution's expert. Opposing experts regularly consider the same materials and offer different conclusions to the jury. It is then up to the jury to evaluate their competing opinions.

Ultimately, concerns about scientific testimony boil down to issues of credibility and weight, both of which are factual determinations left to the jury. See *Watts v. Thomas*, No. 1:09CV206, 2009 U.S. Dist. Lexis 88258, *15 (M.D. N.C. 2009) (arguments that an expert's opinions are based upon work that was "incorrect, invalid, unsupported, etc." "go to the weight of [the expert's] testimony, not its admissibility under the Confrontation Clause"); see also *Fensterer,* 474 U.S. at 21-22, *Locascio*, 6 F.3d at 938; *Dukagjini*, 326 F.3d at 57. Aided by the usual elements of the adversarial process, jurors can be trusted to weed out "absurd and irrational" expert claims. *Daubert*, 509 U.S. at 595.

Taken together, these tools show that cross-examining a testifying expert is an effective check on

scientific evidence and scientific experts in the courtroom.

CONCLUSION

For the foregoing reasons, the Court should affirm the Illinois Supreme Court's decision.

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