**IN THE CIRCUIT COURT OF COOK COUNTY**

**CRIMINAL DIVISION**

**THE STATE OF ILLINOIS )**

**) 17 CR 08092**

**V. )**

**) JUDGE KULL**

**RAYMOND SANCHEZ ) PRESIDING**

**MOTION TO EXCLUDE SCIENTIFICALLY INDEFENSIBLE CLAIMS OF FINGERPRINT “IDENTIFICATION”**

NOW COMES Mr. Raymond Sanchez, through his attorney, Cook County Public Defender Amy P. Campanelli, by her assistants Richard E. Gutierrez and David Holland, and respectfully asks this Court to preclude any testimony by the State’s fingerprint examiner, Charles Schauer, that he “*identified*”[[1]](#footnote-1) the Defendant as the source of any latent prints offered in evidence. Given the term’s dubious history, as well as even its contemporary meaning in the field of fingerprint comparison, use of the word “identification” will convey an absolute/certain source attribution and will therefore overstate the probative value of fingerprint evidence, unduly prejudice the Defense, and mislead the trier of fact. In support thereof the Defendant asserts the following:

1. **Introduction**

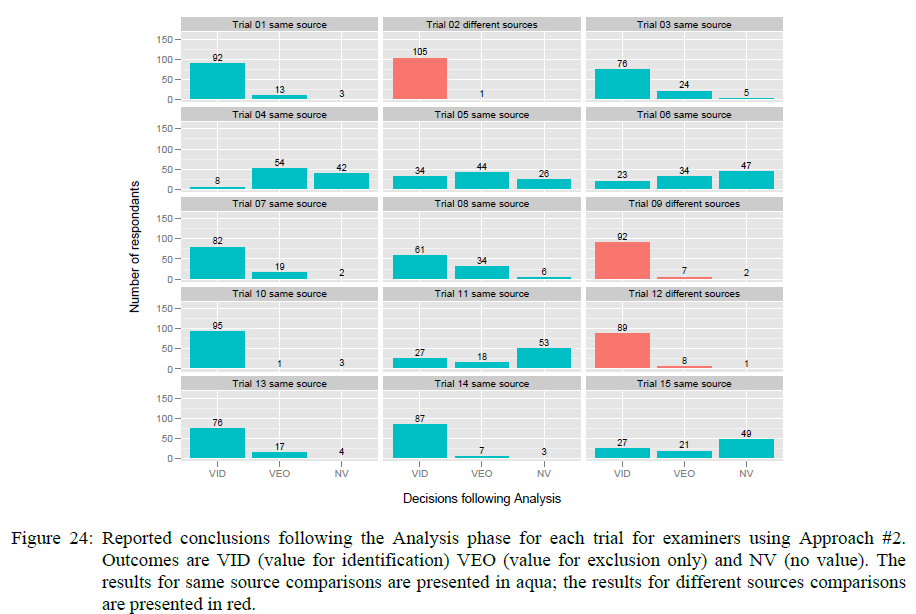
Despite fingerprint-comparison methodology’s acceptance as foundationally valid by both the courts[[2]](#footnote-2) and the broader scientific community,[[3]](#footnote-3) the field’s inherent subjectivity and lack of robust population data still fail to justify absolutist associations between crime-scene latent prints and any single person (or put another way, cannot support narrowing the pool of individuals whose fingers might match a given latent print down from the whole of humanity to one, and only one, possible source).[[4]](#footnote-4) Although conscientious fingerprint examiners have recently acknowledged as much—and consequently have abandoned the most pernicious and patently-false ***definitions*** of “identification” (i.e. that fingerprint source attributions can be made to the exclusion of all others in the world, with 100% certainty, and subject to zero error)[[5]](#footnote-5)—they persist in employing that same term­­—again, in the face of its long historical association with prior claims of infallibility.[[6]](#footnote-6) In fact, even the term’s allegedly-rehabilitated new meaning remains tethered to scientifically illegitimate assertions of certainty (admitting to only a purely theoretical chance of error by claiming that if a latent print is identified, then the “likelihood the impression was made by another (different) source is so remote that it is considered as a ***practical impossibility***”).[[7]](#footnote-7)

Such a merely “semantic refor[m]” substantively “change[s] nothing or change[s] very little”[[8]](#footnote-8) and also fails to in any way compensate for the unwarranted esteem now bestowed on the field of fingerprint comparison due to its decades-long deployment of hyperbolic claims.[[9]](#footnote-9) As such, use of the words “identification” or “identified” will materially overstate the appropriate probative value of fingerprint evidence and mislead jurors into granting such an opinion undeserved weight.[[10]](#footnote-10) This Court should therefore utilize its substantial discretion under Illinois Rule of Evidence 403 to limit the scope of the conclusions offered by the State’s fingerprint examiner, Charles Schauer.

1. **Fingerprint Comparison Methods Presently Lack the Data & Objectivity Necessary to Justify Definitive Conclusions of Identification.**

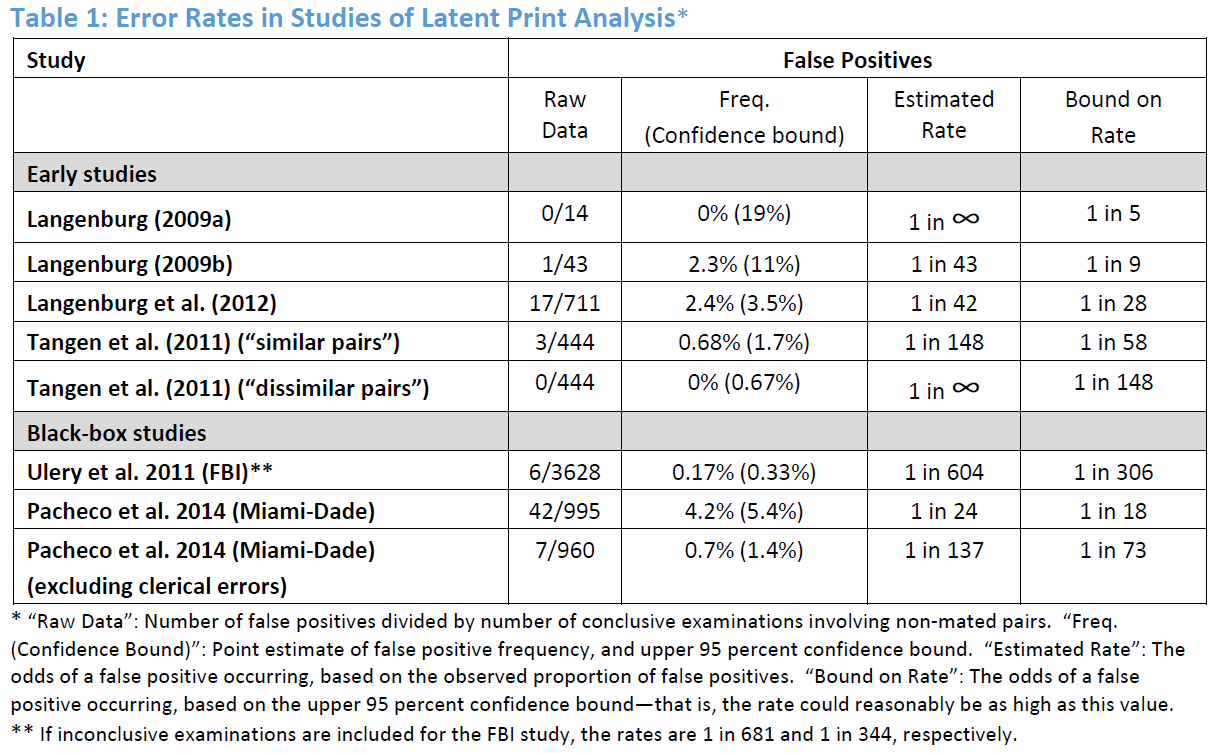
For the vast majority of its decades-long existence, the discipline of fingerprint comparison (relying heavily on now-abandoned mysticism tied to a blind faith in the uniqueness of fingerprints)[[11]](#footnote-11) clung resolutely to claims trumpeting the nigh-divinity of its method, with even leading law enforcement agencies, like SWGFAST and the FBI, encouraging examiners to testify in absolute terms by asserting that a suspect was the source of a print in evidence to the exclusion of all other people on earth and with 100% certainty and zero chance of error.[[12]](#footnote-12) Such declarations always rested on unsure footing given that the field had never (and in fact to this day has never) conducted the types of large-scale population studies that would be necessary to develop numerical/objective thresholds for delineating precisely what level of similarity separates a fingerprint match from a fingerprint exclusion.[[13]](#footnote-13) But, despite disagreeing about even the basic propriety of conditioning match conclusions on minimum numbers of shared features (as well as, if they have implemented objective criteria, where exactly to set the minimum similarities required),[[14]](#footnote-14) it was not until recently that practitioners so much as acknowledged the subjectivity of their method,[[15]](#footnote-15) and therefore its attendant susceptibility to error and bias.[[16]](#footnote-16)

In fact, multiple (and long overdue) research studies have now confirmed that significant variability permeates not only the ultimate conclusions of even highly-experienced examiners as to whether a latent print can be identified or excluded as originating from a particular source individual (with one study demonstrating that examiners disagree up to 50% of the time on difficult cases),[[17]](#footnote-17) but also the arena of more basic and preliminary questions such as whether the features in a fingerprint are sufficiently clear and complete to even be suitable for analysis:

[[18]](#footnote-18)

And actually, when asked to complete a baseline task in their field and identify the features relevant to their analysis of fingerprints, examiners vary widely in terms of the features actually observed (both the number and location of features) as well as the significance of their findings (i.e. different examiners have different thresholds for the number of features in correspondence necessary to justify an identification of a print), with the most recent and comprehensive study on the topic ultimately finding that examiners manage to select any particular feature on the same print only 47% of the time when (as is common in casework) there are issues of clarity, and only 63% of the time even in clearer areas of prints.[[19]](#footnote-19)

As if such findings were insufficient to knock claims of infallibility from their perch among fingerprint examiners, additional research (and real world miscarriages of justice) have even more pointedly demonstrated the now-undeniable potential for error, for misidentifications, when practitioners engage in the daunting enterprise of comparing fingerprints. For starters, both empirical studies and real-world misidentifications demonstrate that fingerprint examiners’ conclusions change—often to incorrect results—when they (1) are exposed to as little as mundane contextual information like investigative facts (i.e. did the suspect have an alibi), (2) view a suspect’s standard print before full review of the latent print in question, or (3) are tripped up by incidental similarity of prints found by searching large-scale databases.[[20]](#footnote-20) And in fact, every study to have measured the baseline probability of misidentifications by fingerprint examiners has confirmed that (biased by contextual data or not) even highly-qualified and conscientious practitioners, not just never, but frequently, commit errors:

[[21]](#footnote-21)

Moreover, it should further concern the Court that misidentifications have not remained confined to the boundaries of artificial studies, instead infecting the real-world application of fingerprint comparisons to the prosecution of crimes. While fingerprint examiners may claim infallibility or near to it, misidentifications have occurred with unsettling frequency, and even under the auspices of the world’s most prestigious laboratories (for example, in one of the most high-profile instances of a fingerprint error, the FBI’s mistaken work led to the unjust arrest of a U.S. citizen, Brandon Mayfield, in relation to a terrorist bombing in Spain; he would escape prosecution only because Spanish authorities later linked the latent print in question to the true culprit, an Algerian national named Ouhnane Daoud).[[22]](#footnote-22)

Thus, taking all these issues of subjectivity, variability, error, and misidentification together (or really for that matter even taking each in isolation) fingerprint examiners simply have no empirical or scientific basis to claim certainty, whether practical or absolute, in their opinions. Instead and in truth, the best data available from the field demonstrates that false associations likely occur, not at a rate so negligible as to be dismissed as practically impossible, but rather, roughly 1 in every 18 times examiners *believe* they have accurately identified the source of a latent print.[[23]](#footnote-23) The discipline of fingerprint comparison may wish to keep its collective head buried in the sand and ignore that reality, but this Court should not allow their conceit to pollute the search for justice in this case, or any other.

1. **Scientific Authorities Have Repeatedly Pushed Fingerprint Examiners to Reform Their Testimonial Practices, Most Recently by Calling on Them to Abandon All Use of the Term “Identification.”**

Unfortunately, the discipline of fingerprint examination made no independent effort to bring its conclusions in line with the scientific record. Instead that push did not begin in earnest until 2009 when the broader scientific community started taking note of its forensic kin, including fingerprint comparisons, in the wake of a scathing report released by the National Academy of Sciences[[24]](#footnote-24) (an organization long considered, and established by law as, the “leading scientific advisory body …[to] the Legislative Branch”).[[25]](#footnote-25) More specifically, Congress ordered the NAS to investigate the status of several forensic science disciplines based on the recognition that “significant improvements are needed in forensic science.”[[26]](#footnote-26) To that end NAS formed a team of acclaimed scientists, legal minds, and forensic specialists who for two years heard testimony from practitioners (including fingerprint examiners) and tirelessly “considered the peer-reviewed, scientific research purporting to support the validity and reliability of existing forensic disciplines.”[[27]](#footnote-27)

Ultimately, its authors reached unanimity with regard to the deficiencies of forensic identification (and especially pattern matching) approaches,[[28]](#footnote-28) describing such methodologies as more akin to rough heuristics than validated science,[[29]](#footnote-29) and noting in broad strokes that “no forensic method [other than DNA] has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source*.*”[[30]](#footnote-30) Most applicably to this motion, the NAS expressed concern that because “population statistics for fingerprints have not been developed, and friction ridge analysis relies on subjective judgment” it follows that “the outcome of a friction ridge analysis is not necessarily repeatable from examiner to examiner.”[[31]](#footnote-31) Thus, the group unequivocally rejected the practice of overreaching to claim certainty by noting, not only that “claims of absolute, certain confidence in identification are unjustified…[and] should be replaced by more modest claims about the meaning and significance of a ‘match,’”[[32]](#footnote-32) but also that “[b]y acknowledging that there can be uncertainties in this process, the concept of ‘uniquely associated with’ must be replaced with probabilistic association, and other sources of the crime scene evidence cannot be completely discounted.”[[33]](#footnote-33)

The writing already on the walls and its hands forced, the field of fingerprint examination at least responded to the watershed moment that was the publication of the NAS report by at long last acknowledging the need for greater humility in its conclusions. In fact, multiple arms of the field raced to modernize their recommendations on the appropriate bounds of testimony, with SWGFAST noting that “the ability of a latent print examiner to individualize a single latent print impression, with the implication that they have definitively excluded all other humans in the world, is not supported by research,”[[34]](#footnote-34) and the International Association of Identification advising members “to avoid stating their conclusions in absolute terms when dealing with population issues.”[[35]](#footnote-35) Perhaps because these changes left in place not only the term identification itself but even that conclusion’s association with certainty[[36]](#footnote-36)—the community of practitioners largely bought in such that major law enforcement agencies[[37]](#footnote-37) and the majority of labs eventually left claims like “the exclusion of all others” behind.[[38]](#footnote-38)

But commentators were quick to point out the minimal impact of such meaningless and belated concessions, calling out groups like SWGFAST and the IAI for enacting merely “semantic reforms”[[39]](#footnote-39) and “cosmetic change[s]”[[40]](#footnote-40) without abandoning the very terms “identification” and “individualization” that the field itself had worked for so long and with such vigor to link to notions of absolute infallibility. Even some of the discipline’s own, most-authoritative and esteemed leaders, like Dr. Christophe Champod and Henry Swofford, made their opposition to the sufficiency of the SWGFAST-style changes clear.[[41]](#footnote-41) And in so doing they made sure to emphasize the black-and-white mathematics behind their position, discussing, among other points, that while true identifications (where a certain arrangement of friction ridge skin legitimately would not be expected to appear in more than one individual on earth) would require random match probabilities at least as small as 1 in 100 billion,[[42]](#footnote-42) in the fingerprint realm “only random match probabilities of one in a billion or larger can be justified through systematic research. Articulating any smaller probability (down to the probability of zero) is nothing more than a leap of faith or playing God.”[[43]](#footnote-43)

A flood of blue ribbon panels accompanied these whistleblowers, and have time and time again urged fingerprint examiners to take the only responsible and scientifically sound course available by further moderating their conclusions and rejecting use of the term “identification.” First up was a panel (The Working Group on Human Factors), largely comprised of leaders from within the discipline of fingerprint examination, and sponsored jointly by the Department of Justice and the National Institute of Standards and Technology, which undertook years of study in order to produce a 200 page report outlining the strengths and weaknesses of the field.[[44]](#footnote-44) It, like NAS, urged the abandonment of absolute conclusions in favor of more modest testimony, emphasizing that “[b]ecause empirical evidence and statistical reasoning do not support a source attribution to the exclusion of all other individuals in the world, latent print examiners should not report or testify, directly ***or by implication***, to a source attribution to the exclusion of all others in the world.”[[45]](#footnote-45) But actually, it went further by rejecting claims of negligible rates of error and instead recommending that examiners familiarize themselves with, and provide testimony concerning, the empirical evidence regarding the potential for misidentification in order to moderate and legitimize the discipline’s conclusions: “[a] testifying expert should be familiar with the literature related to error rates. . . [t]he expert should not state that errors are inherently impossible or that a method inherently has a zero error rate.”[[46]](#footnote-46)

And the last two years have seen perhaps their own watershed moment as regards source-attribution testimony, with landmark reports, which reject the term “identification” as well as its association with practical certainty, being issued by the President’s Council of Advisors on Science & Technology (“the leading scientific advisory body established by the Executive branch”)[[47]](#footnote-47) as well as the American Association for the Advancement of Science (one of the world’s largest and most reputable scientific organizations).[[48]](#footnote-48) Beginning with PCAST, that panel noted that terms like “match” and “identification” ultimately convey “inappropriately high probative value,” and thus should be replaced by “a more neutral term” that more directly acknowledges the possibility for error.[[49]](#footnote-49) And it rejected not just assertions of absolute certainty, but a host of *lesser* conclusions (including claims suggesting that the chance of error is “minimal” or “a practical impossibility”), noting that “judges, when permitting an expert to testify … should ensure that testimony … it is limited to what the empirical evidence supports. [s]tatements suggesting or implying greater certainty are not scientifically valid and should not be permitted.[[50]](#footnote-50) In fact, for fingerprints specifically, PCAST recommended that opinions regarding source by examiners should be

“*accompanied by accurate information about limitations on the reliability of the conclusion—specifically, that (1) only two properly designed studies of the foundational validity and accuracy of latent fingerprint analysis have been conducted, (2) these studies found false positive rates that could be as high as 1 error in 306 cases in one study and 1 error in 18 cases in the other, and (3) because the examiners were aware they were being tested, the actual false positive rate in casework may be higher.*”[[51]](#footnote-51)

Only by so doing, the PCAST emphasized, could fingerprint examiners defensibly act with “clarity and restraint” and afford jurors a legitimate opportunity to grasp the scientific reality that “the fact that two samples satisfy a method’s criteria for a proposed match does not mean that the samples are from the same source.”[[52]](#footnote-52)

And the AAAS report, which focused solely on fingerprint comparisons, would independently reach the same conclusions. Relying on the risk of juror confusion, as well as the same mathematical realities discussed earlier by Champond,[[53]](#footnote-53) that organization unequivocally denounced use of the word “identification” and its attendant assertions of practical certainty:

*“The scientific literature does not, however, provide an adequate basis for assessing the rarity of any particular feature, or set of features, that might be found in a fingerprint. Examiners may well be able to exclude the preponderance of the human population as possible sources of a latent print, but there is no scientific basis for estimating the number of people who could not be excluded and there are no scientific criteria for determining when the pool of possible sources is limited to a single person…Consequently, we have concluded that latent print examiners should avoid claiming that they can associate a latent print with a single source*.”[[54]](#footnote-54)

In fact, AAAS went so far as to provide fingerprint examiners with a model for scientifically-responsible reporting of their conclusions, advising them to candidly discuss error rates, but to say nothing more definitive than:

*“The latent print on Exhibit ## and the record fingerprint bearing the name XXXX have a great deal of corresponding ridge detail with no differences that would indicate they were made by different fingers. There is no way to determine how many other people might have a finger with a corresponding set of ridge features, but it is my opinion that this set of features would be unusual.”[[55]](#footnote-55)*

Such recommendations represent the culmination of years of study by some of the finest available minds of our time, and clearly indicate that the term “identification” falls well outside the bounds of scientific legitimacy. That so many have had to come from scientists outside the field of fingerprint examination demonstrates only that the field itself cannot be left alone to appropriately moderate its conclusions.[[56]](#footnote-56) That task, for better or worse, now falls to the courts.

1. **Use of the Term “Identification” Will Grossly Overstate the Probative Value of Fingerprint Evidence & Will Unduly Prejudice the Defense.**

It should by now be clear that when fingerprint examiners claim the ability to “identify” the source of a latent print, they are not simply engaging in mild exaggeration of their discipline’s capabilities, but instead, are peddling patent falsehoods. Such assertions (whether or not defined overtly as involving practical certainty) simply do not square with the currently-demonstrable statistical likelihood of coincidental similarity between random prints, much less the far-more substantial possibility of error during an examiner’s exercise of subjective judgment—and that is to say nothing of the compounded chance for a misidentification when, as is always true during the course of casework, both avenues for error can manifest simultaneously. Thus, while fingerprint examiners may continue to be “reluctant to abandon the claim that they can ‘identify’ the source of a latent print”[[57]](#footnote-57) the wanton speculation required for them to so conclusively implicate any particular defendant in no way deserves the imprimatur of this Court.[[58]](#footnote-58)[[59]](#footnote-59)

And Illinois Rule of Evidence 403, which requires exclusion of evidence “if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury,” provides an ideal vehicle for preventing any spurious claims by the State’s fingerprint examiner in this matter. As the Illinois Supreme Court has recognized, the admissibility of expert testimony in any given case will always “depend on the State's ability to lay a proper foundation and to demonstrate the qualifications of its witness, subject to the balancing of probative value with the risk of unfair prejudice,”[[60]](#footnote-60) and the very First District opinion to most recently affirm the admissibility of fingerprint evidence under Frye actually left the door wide open for attorneys to attack and seek exclusion of overreaching opinions by examiners on a case-by-case basis, noting that “the viability of specific efforts to exclude claims of zero error or testimony regarding the certainty of a match in future cases …[will] depend on the specific testimony and the support offered for those claims.”[[61]](#footnote-61) In fact, both courts and commentators have noted that expert testimony actually requires heightened, rather than diminished, vigor with regard to applying Rule 403 given the “natural inclination of the jury to equate science with truth and, therefore, accord undue significance to any evidence labeled scientific.”[[62]](#footnote-62)

Such conclusions, moreover, find added support in scientific findings about the perceptions of jurors, and demonstrate the heightened risk of undue prejudice and confusion stemming from the use of terms like “identification.” The PCAST report, for example, emphasizes that “[c]ompared to many types of expert testimony, testimony based on forensic feature-comparison methods poses unique dangers of misleading jurors,” because “[t]he vast majority of jurors have no independent ability to interpret the probative value of results based on the detection, comparison, and frequency of scientific evidence…they would be completely dependent on expert statements garbed in the mantle of science.” [[63]](#footnote-63) And in the context of fingerprint examinations more specifically, robust empirical findings actually bear out the troubling reality that “[p]ublic perceptions of latent print examination have undoubtedly been shaped by decades of overstatement” meaning that “people generally think a reported association between a latent and reference print constitutes a virtually infallible identification.”[[64]](#footnote-64) In fact, the vast majority of potential jurors should be expected to interpret the word “identification” specifically as conveying absolute certainty,[[65]](#footnote-65) and to come to trial with a grossly inflated sense of the reliability of fingerprint evidence (likely believing that errors would occur only about once per every 5.5 million cases).[[66]](#footnote-66)

Nor will such misconceptions be amenable to correction by the normal workings of the adversarial process. While it may be tempting for this Court to dismiss concerns regarding exaggerations by the State’s fingerprint expert as mere issues of weight as opposed to admissibility, such a hands-off approach could only be justified if cross-examination actually possessed the potential to expose the weaknesses underlying fingerprint examination and meaningfully impact a jury’s perception of the strength of the State’s forensic evidence. Yet, a significant quotient of recent scientific research runs contrary to such a leap of faith.[[67]](#footnote-67) Study after study demonstrates that, in fact, even robust and pointed cross-examination that is well-designed to expose weaknesses in forensic practitioners’ methods has little to no power to do so,[[68]](#footnote-68) especially when experts phrase their conclusions in unshakable terms like “identification.”[[69]](#footnote-69)

The researchers responsible for said studies themselves conclude that their “results should give pause to anyone who believes the adversarial process will always undo the effects of weak expert testimony.”[[70]](#footnote-70) And judges have acknowledged as much, noting that while “cross-examination is a minimal constitutional safeguard … it is far from adequate.”[[71]](#footnote-71) But more than that, courts have gone beyond simply sermonizing about the dangers of exaggerated forensic evidence, with hosts of jurisdictions actually limiting the testimony of forensic examiners.[[72]](#footnote-72) And although some such cases have addressed only the admissibility of absolute certainty statements, a great many have trekked further and precluded all manner of overblown source attributions ranging from claims of practical certainty to mere assertions of identification.[[73]](#footnote-73) This Court should follow suit.

Given that, at all events, the State’s fingerprint examiner must testify to the nuances of his methodology and the points of similarity he observed as part of the foundation for any opinion,[[74]](#footnote-74)addition of term “identification” adds little in the way of probative value (and none of it legitimate). In contrast, the empirical record regarding juror reactions to fingerprint evidence establishes that the only way to avoid undue prejudice and ensure that factfinders discern the appropriate weight of fingerprint evidence is to, if necessary, force examiners to accurately, and without hyperbole, explain the limits of their field.[[75]](#footnote-75) Thus, a more than substantial record exists to justify the exercise of this Court’s discretion under Rule 403. And, given that a jury will likely view the very presentation of fingerprint evidence at trial as an indication of this Court’s tacit approval of the examiners methods and conclusions,[[76]](#footnote-76) neutrality is simply not an option.

1. **Conclusion**

Illinois courts have long required even DNA experts (who hail from a field benefiting from far more rigorous and substantial foundational research than is available concerning fingerprints)[[77]](#footnote-77) to avoid testifying in terms of conclusory match opinions, and in their place, to provide a numerical/statistical sense of the weight owed particular genetic evidence[[78]](#footnote-78)—this despite the fact that said statistics now often soar into the nonillions and decillions, thereby dwarfing the earth’s population by several orders of magnitude.[[79]](#footnote-79) And while it may be reasonable to refrain from punishing the discipline of fingerprint examination by and through the mechanism of wholesale exclusion simply because it has not yet conducted sufficient research to enable similar statistically-derived opinions, it is another matter entirely to instead reward the field by allowing fingerprint examiners to actually go further and inexplicably offer stronger and more definitive conclusions than experts from more scientifically-robust forensic disciplines (especially considering that available data concerning fingerprint variability hints that the statistical value of matches in that realm will never even remotely approach the discriminating power possible with DNA). But that is precisely the “perverse” result fashioned by permitting fingerprint examiners to suggest certainty in their conclusions and deploy the word “identification.”[[80]](#footnote-80) Thus, the time is ripe—perhaps even long overdue—for courts to actuate their role as gatekeepers of scientific evidence[[81]](#footnote-81) and bring the treatment of fingerprint evidence into conformity with the standards required of other forensic disciplines. By doing so now, this Court will ensure the scientific legitimacy of the forensic opinions confronting Mr. Sanchez while providing the trier of fact with the most comprehensible and honest accounting of the appropriate weight of fingerprint comparisons.

Wherefore, Mr. Sanchez requests that this Court limit the testimony and conclusions of the State’s fingerprint examiner, Charles Schauer, so as to preclude scientifically unacceptable statements of “identification.” Instead this Court should require said examiner to offer applicable error rates during his testimony, and should cabin his conclusion statements in accordance with the recommendations, discussed above, of AAAS.[[82]](#footnote-82)

Respectfully Submitted,

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1. *See* Charles A. Schauer, “*Fingerprint Examination Report: Supplement No.1, R.E.Walsh Case Review#REW-17-06, Agency Case#17-00218*,” (Aug. 11, 2017) (where the State’s fingerprint examiner states his conclusion as follows: “Exhibit 1A [the crime scene latent print] was ***identified*** to the fingerprint card of Raymond Y. Sanchez”) (attached as Exhibit I). [↑](#footnote-ref-1)
2. *See e.g., People v. Luna*, 2013 IL App (1st) 072253, ¶81 (1st Dist. 2013). [↑](#footnote-ref-2)
3. *See e.g.,* President’s Council of Advisers on Science & Technology, “*Forensic Science in Criminal Courts:* *Ensuring Scientific Validity of Feature-Comparison Methods*,” at 101 (Sept. 20, 2016). [↑](#footnote-ref-3)
4. *See e.g.,* American Association for the Advancement of Science, “*Forensic Science Assessments: A Quality and Gap Analysis-Latent Fingerprint Examination*,” Report prepared by William Thompson, John Black, Anil Jain, & Joseph Kadane, at 71 (2017) (“While latent print examiners may well be able to exclude the preponderance of the human population as possible sources of a latent print, there is no scientific basis for estimating the number of people who could not be excluded and, consequently, no scientific basis for determining when the pool of possible sources is limited to a single person”). [↑](#footnote-ref-4)
5. *See e.g.,* Office of the Inspector General, “*A Review of the FBI’s Progress in Responding to the Recommendations in the Office of the Inspector General Report on the Fingerprint Misidentification in the Brandon Mayfield Case*,” U.S. Department of Justice, at 8 (2011) (Historically, latent fingerprint examiners expressed identification conclusions in terms of “100% certainty,” with zero likelihood that the latent fingerprint was made by a different person. Although the FBI laboratory has not lowered the standard required to make an identification, examiners no longer testify that they are “100% certain.”); Department of Justice, “*Approved Uniform Language for Testimony & reports for the Forenisc Latent Print Discipline*,” at 2-3(2018) (“An examiner shall not assert that two friction ridge impressions originated from the same source to the exclusion of all other sources or use the terms ‘individualize’ or ‘individualization’…shall not assert a 100% level of certainty…”). [↑](#footnote-ref-5)
6. *See* Scientific Working Group on Friction Ridge Analysis, Study, & Technology (SWGFAST), “*Document #103: Individualization/ Identification Position Statement (Latent/Tenprint)*,” at 1 (2012) (acknowledging that “individualization has been used within the latent print community to mean ‘to the exclusion of all others’” but nevertheless retaining the term). [↑](#footnote-ref-6)
7. *See* SWGFAST, “*Document #10 Standards for Examining Friction Ridge Impressions and Resulting Conclusions (Latent/Tenprint)*,” at 4 (2013). [↑](#footnote-ref-7)
8. Simon A. Cole, “*Individualization is dead, long live individualization! Reforms of reporting practices for fingerprint analysis in the United States*,” 13 Law, Prob., & Risk 117, 144 (2014); *see also* William Tobin & Peter Blau, “*Hypothesis Testing of the Critical Underlying Premise of Discernible Uniqueness in Firearms-Toolmark Forensic Practice*” 53 Jurimetrics 121, 131 (2013) (calling on practitioners in the related, pattern-matching field of firearms examination to “curb the excesses” of their conclusions by noting that “the switch to weaker forms of source attribution (such as ‘practical certainty’) is a cosmetic change that does nothing to remedy the underlying scientific shortcomings of F/TM practice”) [↑](#footnote-ref-8)
9. *See e.g.,* H.J. Swofford & J.G. Cino, “*Lay Understanding of “Identification”: How Jurors Interpret Forensic Identification Testimony*,” 68 J. Forensic Identification 29 (2018) (study concluding that “71% of potential jurors may be expected to interpret expert testimony containing the word ‘identification’…to imply a single source attribution ‘to the exclusion of all others’”); Jonathan J. Koehler, “*Intuitive Error Rate Estimates for the Forensic Sciences*,” 57 Jurimetrics 153, 162 (2017) (pool of jury-eligible participants estimated misidentification rate for fingerprints to be “1 in 5.5 million”). [↑](#footnote-ref-9)
10. *See e.g.,* National Commission on Forensic Science, “*Views of the Commission Regarding Use of the Term ‘Reasonable Scientific Certainty’*,” Dep’t of Justice, at 3 (2016) (emphasizing that even the lesser term reasonable scientific certainty “cloaks” conclusions with unjustified levels of rigor and respectability and would confuse or mislead jurors concerning the weight owed forensic testimony); Budowle *et al.*, “*A Perspective on Errors, Bias, & Interpretation in the Forensic Sciences and Direction for Continuing Advancement*,” 54 J. Forensic Sci. 798, 804 (2009) (conceding that with the use of terms like match or identification, there may be an “unintended contribution to bias (i.e., conveying more strength than intended)” and suggesting “instead the term ‘failure to exclude,’ which may seem to some more acceptable”). [↑](#footnote-ref-10)
11. *See* PCAST, “*Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods*,” at 62 (Sept. 20, 2016) (“The issue is not whether objects or features differ; they surely do if one looks at a fine enough level. The issue is how well and under what circumstances examiners applying a given metrological method can reliably detect relevant differences in features to reliably identify whether they share a common source. Uniqueness studies, which focus on the properties of features themselves, can therefore never establish whether a particular method for measuring and comparing features is foundationally valid. Only empirical studies can do so.”); Michael J. Saks & Jonathan J. Koehler, “*The Individualization Fallacy in Forensic Science Evidence*” 61 Vand. L. Rev. 199, 208-09 (2008) (uniqueness “exists only in a metaphysical or rhetorical sense. It has no scientific validity, and it is sustained largely by the faulty logic that equates infrequency with uniqueness” & “various arguments have been offered on behalf of the individualization hypothesis. None are scientifically compelling…approaches amount to nothing more than faith and intuition.”); William Tobin & Peter Blau, “*Hypothesis Testing of the Critical Underlying Premise of Discernible Uniqueness in Firearms-Toolmark Forensic Practice*,” 53 Jurimetrics 121, 122-23 (2013) (“The cited scholarly essays suggest that forensic individualization based on the claim of uniqueness has a scientifically indefensible conceptual foundation and is a fallacy promulgated by the forensic community. The authors, and relevant mainstream scientists and colleagues with specialized forensic expertise with whom the authors have collaborated, agree.”); John Thorton, “*The General Assumptions & Rationale of Forensic Identification*,” In Modern Scientific Evidence: The Law & Science of Expert Testimony, at 12 (1997) (uniqueness does “not seem susceptible of rigorous proof. But the general principle cannot be substituted for a systematic and thorough investigation of a physical evidence category”); Michael J. Saks, Jonathan L. Koehler, “*The Coming Paradigm Shift in Forensic Identification Science*,” 309 Science 892 (2005) (assumption of uniqueness “although lacking theoretical or empirical foundations” perseveres in forensics perhaps because “it offers important practical benefits” to practitioners); Mark Page *et al.*, “*Uniqueness in the Forensic Identification Sciences-Fact or Fiction?*” 206 Forensic Sci. Int. 12, 15 (2011) (the concept of uniqueness has more the qualities of a cultural meme than a scientific fact,” because, as the authors explain, “most of the studies attempting to prove the uniqueness of a particular forensic feature suffer flaws that render their conclusion questionable”); Christophe Champod, “*Fingerprint identification: advances since the 2009 National Research Council report*,” Phil Trans. Royal Soc. 370 (2015) (“what is clear from the post NRC report scholarly literature is that the days where invoking ‘uniqueness’ as the main (if not the only) supporting argument for an individualization conclusion are over”). [↑](#footnote-ref-11)
12. *See* Office of Inspector General, “*A Review of the FBI’s Handling of the Brandon Mayfield Case*,” U.S. Department of Justice, at 111 (2006) (noting SWGFAST’s position that “probable, possible or likely individualization conclusions are outside the acceptable limits of friction ridge identification science”); FBI, “*An Analysis of Standards in Fingerprint Identification*,” FBI Law Enforcement Bulletin, (1972) (FBI published articles on fingerprint comparisons in which they asserted that “in the practice of fingerprint identification, there is no room for ‘probable’ identity’”). [↑](#footnote-ref-12)
13. *See* AAAS, “*Forensic Science Assessments: A Quality and Gap Analysis-Latent Fingerprint Examination*,” at 21, & 62-63 (“While the existing scientific literature indicates a low likelihood that prints from different individuals share a large number of common features, the literature does not provide an adequate basis for assessing the rarity of any particular feature, or set of features, that might be found in a print…there is uncertainty about how many matching features and what types of matching features are necessary to reduce the potential donor pool to a single source”); National Academy of Sciences, “*Strengthening Forensic Science in the United States: A Path Forward*,” National Academies Press, at 139-40 & 188-89 (2009) (“population statistics for fingerprints have not been developed, and friction ridge analysis relies on subjective judgments by the examiner. Little research has been directed toward developing population statistics, although more would be feasible” & “In most forensic science disciplines, no studies have been conducted of large populations to establish the uniqueness of marks or features. Yet, despite the lack of a statistical foundation, examiners make probabilistic claims based on their experience. A statistical framework that allows quantification of these claims is greatly needed”); Glenn Langenburg, “*Scientific Research Supporting the Foundations of Friction Ridge Examinations*,” in The Fingerprint Sourcebook, at 14-19 (Dept. of Justice 2012) (“From a statistical viewpoint, the scientific foundation for fingerprint individuality is incredibly weak” & “Although the theory of biological formation certainly supports the notion of friction ridge skin individuality, it must be supported by further empirical testing”) (internal citations & quotations omitted); Sharath Pankanti *et al.*, “*On the Individuality of Fingerprints*,” 24 IEEE Trans. On Pattern Analysis & Machine Intelligence 1010, 1011 (2002) (“the underlying scientific basis of fingerprint individuality has not been rigorously studied or tested”); C. Neumann *et al.*, “*Quantifying the Weight of Evidence from a Forensic Fingerprint Comparison: A New Paradigm*,” 175 J. Royal Stat. Society 1, 2 (2012) (“the evaluation of the weight of evidence associated with any particular fingerprint comparison lacks both a scientific foundation and transparency”); Sir Anthony Campbell, “*The Fingerprint Inquiry Report*,” APS Group of Scotland, at 605, 728 (2012) (“fingerprint evidence is a matter of opinion not fact” & “Examiners presently have insufficient objective evidence by which decisions as to the rarity of characteristics are assessed, and to the extent that such data is available, it is not utilized by examiners”); Organization of Scientific Area Committees, “*OSAC Research Needs Assessment Form-* *Assessing the Sufficiency and Strength of Friction Ridge Features*,” at 2 (2015) (“Currently there is not a reliable assessment of the discriminating strength of specific friction ridge feature types…not knowing the weight of each feature type prohibits comprehensive standards for friction ridge evaluation decisions”); Working Group on Human Factors in Latent Print Analysis, “*Latent Print Examination and Human Factors: Improving the Practice through a Systems Approach*,” National Institute of Justice at 8, 208 (2012) (noting that “there is little research at present that provides objective metrics for determining” thresholds in print comparisons and “there is a strong need for systematic studies pertaining to the reproducibility and discriminating strength of fingerprint features…there is limited research that would allow a global assessment … of the strength of minutiae configurations”). [↑](#footnote-ref-13)
14. *See* Joseph Polski et al., “*The Report of the International Association for Identification, Standardization II Committee*,” (2010) (advising against the implementation of any system conditioning matches of a minimum number of points of commonality); Ulery, *et al*., “*Measuring What Latent Fingerprint Examiners Consider Sufficient Information for Individualization Determinations*,” Proceedings of the National Academy of Sciences, at 1 (2014) (noting that “in some countries, a minimum minutia count (‘point standard’) is used as a criterion for individualization: a 2011 survey of 73 countries by INTERPOL found that 44 countries use a point standard, 24 of which require a minimum of 12 minutiae”). [↑](#footnote-ref-14)
15. Working Group on Human Factors, “*Latent Print Examination and Human Factors*,” at 8 (“At every step in [the fingerprint examination] process, human factors can affect the outcome. Latent print examiners rely heavily on their training and experience to make the required judgments. Subjectivity is an inextricable part of the process.”); *see also* PCAST, “*Forensic Science in Criminal Courts*,” at 9 (classifying fingerprint analysis as a “subjective methodology”); NAS, “*Strengthening Forensic Science in the United State*,” at 184 (“the outcome of a friction ridge analysis is not necessarily repeatable from examiner to examiner…this subjectivity is intrinsic”); Andre Moenssens & Stephen Meagher, “*Fingerprints and the Law*,” in The Fingerprint Sourcebook, at 13-19 (Dept. of Justice 2012) (“subjective judgment is involved in declaring a match”); Bradford T. Ulery *et al.,* “*Measuring What Latent Fingerprint Examiners Consider Sufficient Information for Individualization Determinations*,” at 1 (“Testimony on fingerprint evidence presented in court is based on the examiner’s expert opinion, not an objective metric”). [↑](#footnote-ref-15)
16. *See e.g.,* PCAST, *Forensic Science in Criminal Courts*,” at 5 & 101 (“[s]ubjective methods require particularly careful scrutiny because their heavy reliance on human judgment means they are especially vulnerable to human error, inconsistency across examiners, and cognitive bias” and as to fingerprints specifically, collecting numerous error rate studies and determining that “false positive rates that could be as high as 1 error in 18 cases … because the examiners were aware they were being tested, the actual false positive rate in casework may be higher”); Simon Cole, “*More than Zero: Accounting for Error in Latent Fingerprint Identification*,” 95 J. Crim. L. & Criminology 985, 1029-30 (2005) (conducting meta-analysis of data from proficiency tests given to over 3000 fingerprint examiners and computing a false positive rate of identification of 4.4%); Bradford T. Ulery *et al.,* “*Accuracy & Reliability of Forensic Latent Fingerprint Decisions*,” Proceedings of the National Academy of Sciences, at 7738 (2011) (first large scale study of fingerprint accuracy ever conducted finding that 3% of examiners committed false identifications and nearly all examiners, 85%, falsely excluded prints); Bradford T. Ulery *et al.,* “*Repeatability and Reproducibility of Decisions By Latent Print Examiners*,” Proceedings of the National Academy of Sciences, at 8 (2012) (examiners disagreed with one another about 50% of the time on difficult cases and about 20% of the time on the easiest cases, moreover examiners changed their own opinions when taking a second look at evidence around 30% of the time); Neumann *et al*., “*Improving the Understanding and the Reliability of the Concept of ‘Sufficiency’ in Friction Ridge Examination*,” U.S. D.O.J., at 56 (2013) (variation between examiners in every one of 15 trials); Itiel E. Dror & David Charlton, “*Why Experts Make Errors*,” 56 Journal of Forensic Identification 600 (2006) (biasing case information swayed even experienced examiners’ judgments about the source of fingerprints). [↑](#footnote-ref-16)
17. *See e.g.,* Bradford T. Ulery *et al.,* “*Accuracy & Reliability of Forensic Latent Fingerprint Decisions*,” Proceedings of the National Academy of Sciences, at 7738 (2011) (first large scale study of fingerprint accuracy ever conducted finding that 3% of examiners committed false identifications and nearly all examiners, 85%, falsely excluded prints); Bradford T. Ulery *et al.,* “*Repeatability and Reproducibility of Decisions By Latent Print Examiners*,” Proceedings of the National Academy of Sciences, at 8 (2012) examiners disagreed with one another about 50% of the time on difficult cases and about 20% of the time on the easiest cases, moreover examiners changed their own opinions when taking a second look at evidence around 30% of the time); Cedric Neumann *et al*., “*Improving the Understanding and the Reliability of the Concept of ‘Sufficiency’ in Friction Ridge Examination*,” U.S. Department of Justice, at 56 (2013) (variation between examiners in every one of 15 trials). [↑](#footnote-ref-17)
18. *See* Neumann *et al*., “*Improving the Understanding and the Reliability of the Concept of ‘Sufficiency’ in Friction Ridge Examination*,” at 53, 85 (conducting trials with 164 fingerprint examiners and finding significant variation in their suitability determinations—in one trial examiners split nearly 50/50—leading authors to opine that “it appears urgent to develop and provide guidelines and training defining more robustly the concept of minutiae”). [↑](#footnote-ref-18)
19. *See* Ulery, “*Measuring What Latent Fingerprint Examiners Consider Sufficient*,” at 9, 11 (for some prints included in the study examiners minutiae counts ranged from 5 to 20 or more features, leading the authors of the study to state: “Although we expected variability in minutiae counts, we did not expect the counts to vary as much as they did, especially in those critical cases in which examiners do not agree on their determination and precise counting might be pivotal. The differences in minutiae count understate the variability between annotations because annotations not only differ substantially in total minutiae counts, but also in which specific minutiae were selected”). Ulery *et al.*, “*Interexaminer variation of minutia markup on latent fingerprints*,” 264 Forensic Science International 89, 94-95 (2016). [↑](#footnote-ref-19)
20. *See* Dror & Charlatan, “*Why Experts Make Errors*,” 56 Journal of Forensic Identification , at 612 (in 6 of 48 trials examiners changed previous conclusions when presented with information regarding defendant confessions or alibis, leading researchers to conclude that findings “demonstrate that fingerprint experts were vulnerable to biasing information when they were presented within relatively routine day-to-day contexts, such as corroborative (or conflicting) evidence of confession to the crime”); Itiel E. Dror *et al*., “*Contextual information renders experts vulnerable to making erroneous identifications*,” 156 Forensic Science International 74, 76 (2006) (four of five examiners changed previous conclusions when presented information masking prints as those from a famous misidentification, leading to findings that “fingerprint identification decisions of experts are vulnerable to irrelevant and misleading contextual information”); Itiel E. Dror *et al*., “*Cognitive issues in fingerprint analysis: Inter- and intra-expert consistency and the effect of a ‘target’ comparison*,” 208 Forensic Science International 10, 16 (2011) (study “demonstrates that the presence of a comparison print can affect the analysis of the latent mark); OIG “*A Review of the FBI’s Handling of the Brandon Mayfield Case*,” at 138 (error in most famous fingerprint misidentification of all time, Brandon Mayfield, occurred in part because features “were adjusted or influenced during the comparison phase by reasoning ‘backward’ from features that are visible in the Mayfield exemplars”); Itiel E. Dror & Jennifer Mnookin, “*The use of technology in human expert domains: challenges and risks arising from the use of automated fingerprint identification systems in forensic science*,” 9 Law, Probability, & Risk 47 (2010) (“the chances of finding by [through an AFIS search] pure coincidence a lookalike print, a print originating from another person but that is nevertheless extremely similar to the latent print, is much higher than when comparing the latent print to just as a few dozens, hundreds or even thousands of prints prior to the introduction of AFIS”); Itiel E. Dror *et al*., “*The Impact of Human Technology Cooperation & Distributed Cognition in Forensic Science: Biasing Effects of AFIS Contextual Information on Human Experts*,” 57 Journal of Forensic Science 343, 351 (2012) (empirical study of examiner performance using AFIS discovered that “when false identifications occur, they are closely centered at the top of the list, further showing the biasing effects of position. Such false identifications occurred even when a more similar print (the actual matching one) was present in a lower position on the same list” and “false identifications are more likely as the comparison print is more similar to the latent”). [↑](#footnote-ref-20)
21. PCAST, “*Forensic Science in Criminal Courts*,” at 98. These studies are actually more disturbing than they might otherwise appear given that their results constitute nothing more than “lower bound estimates” for the frequency of misidentifications: “because the examiners were aware they were being tested, the actual false positive rate in casework may be higher.” Michael J. Saks & Jonathan L. Koehler, “*The Coming Paradigm Shift in Forensic Identification Science*,” 309 Science 892 (2005) (“Indeed these existing data [on error rates] are probably best regarded as lower- bound estimates of error rates. Because the tests are relatively easy …and because participants know that mistakes will be identified and punished, test error rates …are lower than those in everyday casework.”); *see also* PCAST, “*Forensic Science in Criminal Courts*,” at 149; Adina Schwartz, “*Challenging Firearms and Toolmark Identification- Part Two*,” The Champion XXXII (9): 44-52, 47 (2008) (“results on the CTS tests provide an inflated, rather than an accurate, estimate of the competence of examiners”). [↑](#footnote-ref-21)
22. *See e.g.,* Robert B. Stacey “*A Report on the Erroneous Fingerprint Individualization in the Madrid Train Bombing Case*,” 54 Journal of Forensic Identification 706 (2004) (discussing Mayfield misidentification); OIG “*A Review of the FBI’s Handling of the Brandon Mayfield Case*,” U.S. Department of Justice (2006) (same); Simon Cole, “*More than Zero: Accounting for Error in Latent Fingerprint Identification*,” 95 J. Crim. L. & Criminology 985 (2005) (collecting and discussing over twenty cases of fingerprint misidentification despite the fact that the author limited the cases discussed to ones where the fingerprint community had established consensus agreement to the fact that an error had occurred). As was true about above in regards to studies underestimating false identification rates, so too do the numbers of real-world misidentifications ***discovered*** surely provide an unjustly rosy picture of the reality of misidentifications perpetrated by field of fingerprint comparisons. *See* Simon A. Cole, “*Forensic Statistics, Part II ‘Implicit Testing’: Can Casework Validate Forensic Techniques?*,”46 Jurimetrics J. 117, 123 & 126-27 (2006) (“Because the ground truth is not known in casework, a case cannot serve as a test of the accuracy of a forensic assay used in it” & “known misattributions are very likely to only be a small subset of actual misattributions”); Andre A. Moenssens, “*Novel Scientific Evidence in Criminal Cases: Some Words of Caution*,” 84 J. Crim. L. & Criminology 1, 12-13 (1993) (noting that misidentifications occur but “mistakes of this kind are not very likely to be discovered”). [↑](#footnote-ref-22)
23. PCAST, “*Forensic Science in Criminal Courts*,” at 101. [↑](#footnote-ref-23)
24. *See* National Academy of Sciences, “*Strengthening Forensic Science in the United States: A Path Forward*,” National Academies Press (2009). [↑](#footnote-ref-24)
25. PCAST, “*Forensic Science in Criminal Courts*,” at 144. This Court should consider the opinions of the NAS authoritative. Not only have they been cited as such by the United States Supreme Court and other judges across the country, *see e.g.,* Melendez-Diaz v. Massachusetts, 557 U.S. 305 (2009); United States v. Mouzone, 696 F. Supp. 2d 536, 570 (D. Maryland 2009), but the mission and history of the NAS ought to afford it ample reverence given that it has been tasked by Congress since the days of Abraham Lincoln “with providing independent, objective advice to the nation on matters related to science and technology” and has produced landscape-shifting studies of the forensic sciences (including the use of coroners offices, DNA statistics, and the shortcomings of bullet-lead analysis) since the 1920s. *See* http://www.nasonline.org/about-nas/mission/; *see also* David Kaye, “*The good, the bad, the ugly: The NAS report on strengthening forensic science in America*,” 50 Science & Justice 8, 8-9 (2010). [↑](#footnote-ref-25)
26. NAS, “*Strengthening Forensic Science in the United States,”* at xix. [↑](#footnote-ref-26)
27. The Honorable Harry T. Edwards, “*The National Academy of Sciences Report on Forensic Sciences: What it Means for the Bench & Bar*,” Presentation to the Superior Court of DC, at 1-2 (2010). [↑](#footnote-ref-27)
28. *Id.* at 1 (“the substance of the Committee’s Report was really not hard to write. The problems that plague the forensic science community have been well understood for quite some time”). [↑](#footnote-ref-28)
29. National Academy of Sciences, “*Strengthening Forensic Science in the United States: A Path Forward,” National Academies Press*, at 128 (2009). [↑](#footnote-ref-29)
30. *Id.* at 7. [↑](#footnote-ref-30)
31. *Id.* at 139. [↑](#footnote-ref-31)
32. Id. at 142. [↑](#footnote-ref-32)
33. Id. at 184. [↑](#footnote-ref-33)
34. SWGFAST, “*Document #103: Individualization/ Identification Position Statement (Latent/Tenprint)*,” at 1 (2012). [↑](#footnote-ref-34)
35. Robert Garrett, “*Memorandum from the President of the International Association of Identification*,” (2009). [↑](#footnote-ref-35)
36. *See* SWGFAST, “*Document #10 Standards for Examining Friction Ridge Impressions*,” at 4 (2013). [↑](#footnote-ref-36)
37. *See e.g.,* OIG, “*A Review of the FBI’s Progress in Responding to the Recommendations in the Office of the Inspector General Report on the Fingerprint Misidentification in the Brandon Mayfield Case*,” at 8 (FBI “examiners testify that they are confident in the conclusion, would not expect to see the same amount of information repeated if the fingerprints originated from different people, an find no physical evidence causing them to doubt that the fingerprints are from the same source”); Defense Forensic Science Center, “*Information Paper, Subject: Use of the Term Identification in Latent Print Technical Reports*,” (Nov. 3, 2015) (noting that “several well respected and authoritative scientific committees and organizations have recommended forensic science laboratories not report or testify, directly or by implication, to a source attribution to the exclusion of all others in the world or to assert 100% certainty and state conclusions in absolute terms when dealing with population issues” and instead adopting language as follows: “The latent print on Exhibit # and the record finger/palm prints bearing the name XXXX have corresponding ridge detail. The likelihood of observing this amount of correspondence when two impressions are made by different sources is considered extremely low.”); Department of Justice, “*Approved Uniform Language for Testimony & Reports for the Forensic Latent Print Discipline*,” (2018) (forbidding examiners to testify in terms of absolute certainty or individualization and instead requiring that when practitioners report a “source identification” they instead explain that it is “is a statement of an examiner's belief (an inductive inference) that the probability that the two impressions were made by different sources is so small that it is negligible”). [↑](#footnote-ref-37)
38. AAAS, “*Forensic Science Assessments, A Quality & Gap Analysis*,” at 60 (“many if not most latent print examiners in the United States have already ceased making such claims” of 100% certainty and the like). [↑](#footnote-ref-38)
39. Cole, “*Individualization is dead*,” 13 Law, Prob., & Risk at 144 (2014); *see* Simon Cole, “*Forensics without uniqueness, conclusions without individualization: the new epistemology of forensic identification*,” 8 Law, Prob., & Risk 233, 234 (2009) (“forensic identification---historically and still today---rests upon indefensible conceptual foundations”). [↑](#footnote-ref-39)
40. Tobin & Blau, “*Hypothesis Testing of the Critical Underlying Premise of Discernible Uniqueness in Firearms-Toolmark Forensic Practice*” 53 Jurimetrics at 131. [↑](#footnote-ref-40)
41. *See* Champond, “*Identification & Individualization*,” in Encyclopedia of Forensic Sciences (2009) (“identification conclusion require examiners to “articulate probabilities outside the reach of the current systematic research” & even “conclusions that use terms such as *very likely* or *almost certain* in relation to a proposition are only logically possible when the nonscientific evidence is taken into account”); H.J. Swofford, “*The Emerging Paradigm Shift in the Epistemology of Fingerprint Conclusions*,” 65 J. Forensic Identification 201, 209 (2015 (recommending a “move away from categoric statements of ‘identification’ or ‘individualization’, which carry implications of absolute source attribution” because although progress away from old definitions of such terms “is certainly notable, it does not entirely meet the objective and presents a situation for potential contradictory interpretations of fingerprint conclusions by the investigator or layperson”); Thompson *et al.*, “*Expertise in Fingerprint Identification*,”58 J. Forensic Sci. 1519 (2013) (“It is clear that an alternative to the current model of fingerprint testimony is required”). [↑](#footnote-ref-41)
42. *See* AAAS, “*Forensic Science Assessments, A Quality & Gap Analysis*,” at 62-63. [↑](#footnote-ref-42)
43. Christophe Champond, “*Fingerprint examination: towards more transparency*,” 7 L., Prob., & Risk 111 (2008). It should be noted that a host of other forensic groups and scholars agreed that overblown conclusions like “identification” were inappropriate. *See e.g.* Budowle *et al.*, “*A Perspective on Errors, Bias, & Interpretation in the Forensic Sciences and Direction for Continuing Advancement*,” 54 J. Forensic Sci. 798, 804 (2009) (with the use of terms like match there may be an “unintended contribution to bias (i.e., conveying more strength than intended)” and suggesting “instead the term ‘failure to exclude,’ which may seem to some more acceptable”); John M. Collins, “*Stochastics-The Real Science Behind Forensic Pattern Identification*,” The Crime Lab Report (2009) (noting the scientific irresponsibility of extreme source attribution conclusions, suggesting instead that examiners more conservatively acknowledge the subjectivity of their work and state only: “I have never seen, nor would I expect to see, this amount of similarity in … different sources”). [↑](#footnote-ref-43)
44. *See* Working Group on Human Factors, “*Latent Print Examination and Human Factors*,” at x, xi, 127. [↑](#footnote-ref-44)
45. *Id.* at 72 (emphasis added). [↑](#footnote-ref-45)
46. *Id.* at 32-33, 124, & 127. In fact another arm of the DOJ, specifically the National Commission on Forensic Science, also took a stand against overblown testimony when in 2016 it rejected even the use of the lesser phrase “to a reasonable degree of scientific certainty” in part because jurors “might equate it with certainty at the level demanded by the ‘beyond a reasonable doubt’ standard of proof.” NCFS, “*Views of the Commission regarding Use of the Term ‘Reasonable Scientific Certainty*,” at 3 (2016). And the Reporting and Testimony Subcommittee of that organization even more directly opined that “Forensic science experts should not state that a specific individual or object is the source of the forensic evidence…other individuals or objects could possess or have left a similar set of observed features.” NCFS Reporting & Testimony Subcommittee, “*Views of the Commission: Statistical Statements in Forensic Testimony*,” at 5 (2016). [↑](#footnote-ref-46)
47. PCAST, “*Forensic Science in Criminal Courts*,” at x. This Court should consider the PCAST report authoritative. The Obama-era-iteration of the PCAST consisted primarily of some of our nation’s leading and most-respected scientists, including: a geneticist from MIT/Harvard who was the principal contributor in efforts to map the human genome, an engineer and Vice President of the National Academy of Engineering, a mathematician and former CEO of The Aerospace Corporation, a doctor who was the first female president of the American College of Physicians, a chemist who directs the Institute for Nanotechnology at Northwestern University, the director of The Laboratory for Geochemical Oceanography at Harvard University, a doctor of biochemistry and professor emeritus at the University of California Berkeley, and a physicist who is a Senior Vice President at a leading aerospace and technology corporation (to name but a few). *See* https://obamawhitehouse.archives.gov/administration/eop/ostp/pcast/about/members. For several decades, the PCAST has reported to the then-sitting U.S. President on a wide range of scientific issues, including, but not limited to, nanotechnology, internet broadband development, cloning, and the uses of science and technology to combat terrorism. *See* https://obamawhitehouse.archives.gov/administration/eop/ostp/pcast/docsreports. In short, the PCAST represents one of the most important and authoritative collections of scientists in the country. And its final report on the pattern matching disciplines has, since its publication, been endorsed by the nation’s most prestigious forensic body (the American Academy of Forensic Sciences), an international consortium of forensic experts, and Judge Alex Kozinski of the United States Court of Appeals for the Ninth Circuit, who went so far as to say that the report “will fundamentally change the way many criminal trials are conducted” and “will likely upend many people’s beliefs” about once-trusted forensic disciplines. Kozinski, “*Rejecting Voodoo Science in the Courtroom*,” Wall Street Journal (Sept. 19, 2016); *see* Motorola Inc. v. Murray, 147 A.3d 751, 759 (D.C. 2016) (J. Easterly *concurring*) (“Fortunately, in assessing the admissibility of forensic expert testimony, courts will have the aid of landmark reports [including PCAST’s]… These reports provide information about best practices for scientific testing, an objective yardstick against which proffered forensic evidence can be measured, as well as critiques of particular types of forensic evidence”); https://news.aafs.org/policy-statements/presidents-council-of-advisors-on-science-and-technology-pcast-report/; The Forensic Institute, “*Commentary on PCAST 2016*,” *available at* http://www.theforensicinstitute.com/news-articles/views-and-opinions/commentary-of-pcast-2016. [↑](#footnote-ref-47)
48. *See* AAAS, “*Forensic Science Assessments: A Quality and Gap Analysis*,” at i. As with PCAST and NAS this Court should treat the AAAS report as authoritative. Since 1848, AAAS has vigorously pushed for scientific progress “through initiatives in science policy, international programs, science education, public engagement, and more.” *Id.*; *see also* Alan Fersht, “*The Most Influential Journals: Impact factor & Eigenfactor*,” 106 PNAS 6883 (2009) (describing the journal as one of three that “have by far and away the most overall influence on science…one of the most influential drivers of scientific progress”). It currently “includes nearly 250 affiliated societies and academies of sciences, serving 10 million individuals” and also publishes the peer-reviewed journal “Science,” which boasts the largest paid circulation of any general science journal in the world. *Id.* In fact, even the United States Supreme Court has acknowledged AAAS as a font of scientific expertise by identifying the organization as a valuable source for reliable referrals of court-appointed experts. *See GE v. Joiner*, 522 U.S. 136, 149-50 (1997). [↑](#footnote-ref-48)
49. PCAST, “*Forensic Science in Criminal Courts*,” at 46. [↑](#footnote-ref-49)
50. *Id.* at 19. [↑](#footnote-ref-50)
51. *Id.* at 149. [↑](#footnote-ref-51)
52. *Id.* at 6. [↑](#footnote-ref-52)
53. *See* AAAS, “*Forensic Science Assessments, A Quality & Gap Analysis*,” at 63 (“The determination that the observable details of a fingerprint are ‘unlikely to be repeated’ rests on the ability of latent print examiners to make extraordinarily precise estimates of the frequency of those details in the human population. Latent print examiners would need, for example, to be able to distinguish a set of details that occurs with a frequency of 1 in 100 billion or less from a set that occurs with a frequency of 1 in 10 billion or more. If latent print examiners cannot make such distinctions accurately, then they cannot determine whether a particular set of details is likely or unlikely to be repeated, and therefore have no basis for making the claim”). [↑](#footnote-ref-53)
54. *Id.* at 60. [↑](#footnote-ref-54)
55. *Id.* at 67. [↑](#footnote-ref-55)
56. Examples of fingerprint examiners and laboratories that rebut this notion of course exist. The U.S. Army’s crime lab, for instance, years ago moved far away from absolute source attribution. *See* Defense Forensic Science Center, “*Information Paper, Subject: Use of the Term Identification in Latent Print Technical Reports*,” (Nov. 3, 2015). And, though its choice of language ultimately remained deeply problematic, *see* Rush Holt, “*Letter from AAAS C.E.O to Rod Rodenstein, Deputy Attorney General*” (Mar. 26, 2018), the DOJ at least removed the words “practical impossibility from its definition of identification. *See* DOJ, “*Approved Uniform Language for Testimony & Reports for the Forensic Latent Print Discipline*,” (2018). But these instances have come far too infrequently, and have had too little influence on the larger community of fingerprint examiners, to absolve the discipline of blame for the innapporpiate testimony that too often still features in courtrooms across the United States. [↑](#footnote-ref-56)
57. AAAS, “*Forensic Science Assessments, A Quality & Gap Analysis*,” at 60. [↑](#footnote-ref-57)
58. *See* *Modelski v. Navistar Int'l Transp. Corp.*, 302 Ill. App. 3d 879, 886 (1st Dist. 1999) (emphasizing that expert “testimony grounded in guess, surmise, or conjecture, not being regarded as proof of a fact, is irrelevant as it has no tendency to make the existence of a fact more or less probable.”); *People v. Sargeant*, 292 Ill. App. 3d 508, 511 (1st Dist. 1997) (excluding the “inconclusive, tentative, and speculative” testimony of a handwriting expert). [↑](#footnote-ref-58)
59. Although the report of the State’s fingerprint examiner uses the word “identified,” his stance with regards to said term’s meaning (and thus his place along the spectrum of reform in his field) remains far more ambiguous. Mr. Schauer’s report itself does not define the term “identified,” and unfortunately his tendered protocols contradict themselves as regards its meaning. All equate the term “identification” with its even more problematic cousin “individualization,” *see* DOJ, “*Approved Uniform Language*,” at 2 (keeping the term identification, but rejecting individualization because it would “wrongly imply that a source identification is based on a statistically-derived or verified measurement or comparison of all friction ridge skin impression features in the world’s population”),but worse, while one protocol offers the caveat, in line with SWGFAST, that an identification is merely “the decision that the likelihood the impression was made by another (different) source is so remote that it is considered as a ***practical impossibility***,” a separate protocol even more indefensibly defines the same term as occurring “when a latent print examiner, trained to competency, determines that two friction ridge impressions originated from the same source, ***to the exclusion of all others***.” R.E.Walsh & Associates, Inc., “*Protocols Addendum A: Quality Assurance* *Guidelines for Latent Print Examiners*,” at 6 (Mar. 9, 2015) (emphasis added) (attached as Exhibit II); R.E.Walsh & Associates, Inc., “*Protocols Addendum B: Standards for Examining Friction Ridge Impressions & Resulting Conclusions (Latent/Tenprint)*,” at 5 (Mar 9, 2015) (emphasis added) (attached as Exhibit III); R.E.Walsh & Associates, Inc., “*Protocols Addendum D: Standard Terminology of Friction Ridge Examination (Latent/Tenprint)*,” at 7-8 (Mar. 9, 2015) (equating identification and individualization and defining the latter merely as an examiner’s conclusion that two ridge impressions “originated from the same source) (attached as Exhibit IV). Despite these incongruities, however, it appears from a more recent interview with Mr. Schauer that he has abandoned the least defensible of such conclusions. *See* “*Illinois v. Akindele: Summary of Interview of Charles Schauer*,” (Feb. 9, 2016) (attached as Exhibit V). This motion therefore operates under the assumption that Mr. Schauer will not make claims of objectivity, zero-error, exclusion of all others, or absolute certainty; of course, all the arguments made throughout this motion apply with even greater force to those outmoded conclusions. [↑](#footnote-ref-59)
60. People v. McKown, 236 Ill.2d 278, 305 (2010); *see also* Luna, 2013 IL App (1st) 072253, at ¶72; People v. Floyd, 2014 IL App (2d) 120507, ¶22-24 (2d Dist. 2014); Murray v. Motorola, Inc., 2014 D.C. Super. LEXIS 16, 33-35, 56-58 (D.C. Super. Ct. 2014); United States v. Frazier, 387 F.3d 1244, 1263 (11th Cir. 2004);United States v. Van Wyk, 83 F. Supp. 2d 515 (D.N.J. 2000); United States v. Santillan, 1999 WL 1201765 (N.D. Ca 1999); United States v. Reynolds, 904 F.Supp. 1529, 1558 (E.D. Oka. 1995); People v. Shreck, 22 P.3d 68, 70 (Colo. 2001); Daubert v. Merrell Dow Pharms., 509 U.S. 579, 595 (1993); Bowers, “*Forensic Testimony: Science, Law and Expert Evidence*,” Academic Press (2014); Mnookin, “*The Courts, NAS, & the Future of Forensic Sciences*,” 75 Brooklyn L. R.  51-55 (2010). [↑](#footnote-ref-60)
61. Luna, 2013 IL App (1st) 072253, ¶ 72 (1st Dist. 2013); *see also* People v. Robinson, 2013 IL App (1st) 102476, ¶ 91 (1st Dist. 2013) (“we conclude the trial court did not err in ruling the testimony [regarding firearms examination] in this case was admissible and did not require a *Frye* hearing, ***particularly where*** the trial judge barred the witnesses from testifying their opinions were ‘within a reasonable degree of scientific certainty’”) (emphasis added). [↑](#footnote-ref-61)
62. New, 2014 IL 116306, at ¶26; *see also* People v. Newberry, 166 Ill.2d 310, 316-17 (1995) (“The State asserts that [the defendant] is not without recourse because he can still assail the State's test results by…cross-examining the State's experts about the procedures they followed. While these opportunities may exist, the relief they offer is illusory. Whatever the actual reliability of the tests performed in the lab -- and the reliability may not be great -- the laboratory analysis of the evidence will carry great weight with the jury”). [↑](#footnote-ref-62)
63. PCAST, “*Forensic Science in Criminal Courts*,” at 45. [↑](#footnote-ref-63)
64. AAAS, “*Forensic Science Assessments, A Quality & Gap Analysis*,” at 71; *see also* Brandon Garrett & Gregory Mitchell, “*How Jurors Evaluate Fingerprint Evidence: The Relative Importance of Match Language, Method Information, and Error Aknowledgemnt*,” 10 J. Empirical Legal Studies, 484, 498 (2011) (noting that proponents of fingerprint evidence “benefit from a widespread assumption among jurors that no two fingerprints are alike” as well, more generally, preconceptions that fingerprint science does not produce errors). [↑](#footnote-ref-64)
65. *See* H.J. Swofford & J.G. Cino, “*Lay Understanding of “Identification*,” 68 J. Forensic Identification 29 (2018) (study concluding that “71% of potential jurors may be expected to interpret expert testimony containing the word ‘identification’…to imply a single source attribution ‘to the exclusion of all others’”). [↑](#footnote-ref-65)
66. *See* Koehler, “*Intuitive Error Rate Estimates for the Forensic Sciences*,” 57 Jurimetrics 153, 162 (2017); *see also* William C. Thompson & Eryn J. Newman, “*Lay Understanding of Forensic Statistics: Evaluation of Random Match Probabilities, Likelihood Ratios, & Verbal Equivalents*,” 39 L. & Hum. Behav. 332 (2015) (juror evaluation of DNA evidence influenced by preconceived notions about the discipline & factfinders are susceptible to statistical fallacies, both prosecution and defense varieties); Jonathan J. Koehler, “*If the Shoe Fits They Might Acquit: The Value of Forensic Science Testimony*,” 8(s1) J. of Empirical Legal Studies 21-48 (2011) (“As detailed in the NRC report the ‘science’ part of forensic science has not kept pace with the extraordinary claims made on its behalf. As a result, jurors have little idea what the chance is that a forensic scientist’s conclusions are wrong, how often different objects share particular characteristics, or how much weight to give the forensic science as proof of identity.” Further noting that jurors “are slow to revise incorrect probabilistic hypotheses” “fall prey to logical fallacies” and “failed to appreciate the role that error plays in interpreting the value of a reported match”); Dawn McQuiston-Surrett & Michael J. Saks, “*Communicating Opinion Evidence in the Forensic Identification Sciences: Accuracy & Impact*,” 59 Hastings L.J. 1159, 1170 (2008) (“most jurors have an exaggerated view of the nature and capabilities of forensic identification”). [↑](#footnote-ref-66)
67. Joseph Sanders, *Reliability Standards—Too High, Too Low, or Just Right? The Merits of the Paternalistic Justification for Restrictions on the Admissibility of Expert Evidence*, 33 Seton Hall L. Rev. 881, 936-938 (2003) (noting, in summary of the author’s analysis of a wide swath of literature, that the results “lend support to the argument that rulings excluding unreliable evidence promote jury accuracy even if we assume jurors are as good as judges in assessing reliability on jurors that” and that “the empirical research does lend some support to the paternalistic justification for restrictions on the admissibility of unreliable expert testimony.”). [↑](#footnote-ref-67)
68. Koehler, “*If the Shoe Fits They Might Acquit*,” (“Contrary to predictions, none of the source and guilt dependent measures in the main experiment were affected by the introduction of cross examination. There was no effect for cross examination on source confidence, source probability, guilt confidence, guilty probability, or verdict. Likewise there was no effect for cross examination across the two individualization conditions on any of the dependent measures.”); Sanders, “*Reliability Standards—Too High, Too Low, or Just Right?*,” at 913, 934-36 (Concluding that multiple studies bear out the sobering reality that even robust cross examination of experts affects neither ultimate verdicts nor even juror confidence in said verdicts); Dawn McQuiston-Surrett & Michael J. Saks, “*The Testimony of Forensic Identification Science: What Expert Witnesses Say & What Factfinders Hear*,” 33 Law & Hum. Behav. 436 (2009) (Authors conducted a study and reviewed others, ultimately finding “little or no ability of cross-examination to undo the effects of an expert’s testimony on direct examination, even if the direct testimony is fraught with weaknesses and the cross is well designed to expose those weaknesses.” Interestingly, the authors conclude that cross examination can effect juror evaluation of expert evidence if it is presented honestly as a subjective guess, but that “...the unshakeableness of the traditional forms: match and similar-in-all-microscopic-characteristics produce something of a ceiling effect, which resist moderation by the presentation of other information.”);Shari Seidman Diamond, *et al.*, “*Juror Reactions to Attorneys At Trial*,” 87 J. Crim. L. & Criminology 17, 41 (1996) (experiment, using 1925 jury-eligible residents of Cook County, which varied the strength of an attorney’s cross examination of an expert witness found that: “Although juror perceptions of the attorney appear susceptible to influence by the attorney's efforts during cross-examination, the strong cross-examination had no effect on the verdict.”). [↑](#footnote-ref-68)
69. PCAST, “*Forensic Science in Criminal Courts*,” at 45-46 (“The potential prejudicial impact is unusually high, because jurors are likely to overestimate the probative value of a “match” between samples” thus the term match conveys “inappropriately high probative value, a more neutral term should be used for an examiner’s belief that two samples come from the same source.”); Koehler, “*If the Shoe Fits They Might Acquit*,” (“people are more persuaded by statistical testimony that ignores various error risks than by testimony that is objectively stronger by virtue of taking those risks into account”);Sanders, “*Reliability Standards—Too High, Too Low, or Just Right?*,” at 935 (Concluding that testimony couched in terms of an expert’s experience, was “more impervious to cross-examination and opposing experts.”); Saks, “*Communicating Opinion Evidence in the Forensic Identification Sciences*,” at 1177 (“The conclusions of examiners in all areas of forensic identification other than DNA typing reach their conclusions on the basis of subjective guesstimations (clinical rather than actuarial), they present their opinions in nonquantitative, usually categorical, terms, and by all indications laypersons are generally quite persuaded by their testimony.”); McQuiston-Surrett & Saks, “*The Testimony of Forensic Identification Science*,” 33 Law & Hum. Behav. 436 (“Participants in the conditions [hearing testimony in terms of a match or that targets were similar in all microscopic characteristics] which led to the highest estimates that the crime scene hair came from the defendant paradoxically gave the highest estimates of the incidence of the same hair traits in the reference population. This reinforces the inference that those two testimonial conditions lead to the least understanding of the basic concepts of forensic identification while leading to the highest inculpatory judgments” & “These data suggest that the two traditional forms in which forensic identification testimony is expressed [again referring to match of the similar-in-all-microscopic-characteristics language] are most damaging to the defense, while communicating a comfortingly simple and easily grasped (though not very informative and presumably misleading) understanding of the basis for the identification opinion.”); John Thorton, “*The General Assumptions & Rationale of Forensic Identification*,” In Modern Scientific Evidence: The Law & Science of Expert Testimony, at 16 (1997) (when an expert “and bases [an] opinion on ‘years of experience’ the practical result is that the witness is immunized against effective cross examination”); Sanders, “*Reliability Standards—Too High, Too Low, or Just Right?*,” at 934. [↑](#footnote-ref-69)
70. McQuiston-Surrett & Saks, “*Communicating Opinion Evidence in the Forensic Identification Sciences*, at 1188; *see also* Sanders, *Reliability Standards—Too High, Too Low, or Just Right?*,” at 936 (same). [↑](#footnote-ref-70)
71. The Honorable Harry T. Edwards, “*The National Academy of Sciences Report on Forensic Sciences: What it Means for the Bench & Bar*,” Presentation to the Superior Court of DC (2010); *see* People v. Zayas, 131 Ill. 2d 284, 292 (1989) (in ruling hypnotically-assisted-recall testimony inadmissible court emphasized the likelihood and danger of prior juror exposure to misleading information about hypnosis); People v. Baynes, 88 Ill. 2d 225, 244 (Ill. 1981) (“There is significant risk the jury will regard [polygraph] evidence as conclusive…It is questionable whether any jury would follow limiting instructions because the polygraph evidence is likely to be shrouded with an aura of near infallibility, akin to the ancient oracle of Delphi.”) (internal citations & quotations omitted);United States v.Glynn, 578 F.Supp.2d 567 (S.D.N.Y. 2008) (“cross-examination is inherently handicapped by the jury’s own lack of background knowledge, so that the Court must play a greater role, not only in excluding unreliable testimony, but also in alerting the jury to the limitations of what is presented.”); Murray, 2014 D.C. Super. LEXIS at ¶60 (“the court cannot be confident that effective advocacy can eliminate the risk that a jury would be misled by [the expert’s] testimony and reach a result on an improper basis.”); American Bar Association, “*Forensic Sciences: Judges as Gatekeeper*,” at 29-30 (2015). [↑](#footnote-ref-71)
72. *See* Commonwealth v. Joyner, 4 N.E.3d 282, 289 (Mass. 2014) (holding that that fingerprint examiners should avoid expressing opinions of absolute certainty); United States v. Taylor, 663 F.Supp.2d 1170, 1180 (D. NM 2009) (“because of the limitations on the reliability of firearms identification evidence discussed above, Mr. Nichols will not be permitted to testify that his methodology allows him to reach this conclusion as a matter of scientific certainty. Mr. Nichols also will not be allowed to testify that he can conclude that there is a match to the exclusion, either practical or absolute, of all other guns.”); United States v. Ashburn, 88 F.Supp.3d 239, 249 (E.D.N.Y. 2015) (quoting the finding of the NAS Committee that forensic ballistic comparison “suffers from certain ‘limitations,’ including the lack of sufficient studies to understand the reliability and repeatability of examiners’ methods . . .” and precluding “expert witness from testifying that he is ‘certain’ or ‘100%’ sure of his conclusions that certain items match ... that a match he identified is to ‘the exclusion of all other firearms in the world,’ or that there is a ‘practical impossibility’ that any other gun could have fired the recovered materials.”); Massachusetts v. Pytou Heang, 942 N.E.2d 927, 945-46 (2010) (allowing testimony to a reasonable degree of ballistics certainty but precluding statements describing firearms examination as a science or phrasing of conclusions to an absolute or practical certainty); United States v. Monteiro, 407 F.Supp.2d 351, 375 (D. Mass. 2006) (limiting testimony to “reasonable degree of ballistic certainty”); United States v. Diaz, 2007 U.S. Dist. LEXIS 13152, at \*41-42 (N.D. Cal. 2007) (precluding matches to the exclusion of all other guns in the world); United States v. Love, No. 2:09-cr-20317-JPM (W.D. Tenn. Feb. 8, 2011) (excluding testimony regarding absolute or practical certainty); United States v. Alls, No. CR2-08-223(1) (S.D. Ohio Dec. 7, 2009) (forbidding any claim of a match to one firearm to the exclusion of all other guns and limiting examiner to descriptions of her methodology and observations of casings); Christophe Champod, “*Fingerprint identification: advances since the 2009 National Research Council report*,” at 5 (describing the “increasing tendency among courts to refrain from accepting fingerprint evidence as facts that can be expressed with 100% certainty or suggesting that the evidence alone is enabling the exclusion of all others in the world except the concerned individual”); Cole, “*Individualization is dead*,” 13 L., Prob., & Risk at 134 (collecting cases limiting fingerprint testimony). [↑](#footnote-ref-72)
73. *See* United States v. Oskowitz, 294 F. Supp. 2d 379, 384 (E.D.N.Y. 2003) (“Many other district courts have similarly permitted a handwriting expert to analyze a writing sample for the jury without permitting the expert to offer an opinion on the ultimate question of authorship.”); United States v. Rutherford, 104 F. Supp. 2d 1190, 1194 (D. Neb. 2000) (expert limited to “explaining the similarities and dissimilarities between the known exemplars and the questioned documents” and “precluded from rendering any ultimate conclusions on authorship of the questioned documents and is similarly precluded from testifying to the degree of confidence or certainty on which his opinions are based”); United States v. Hidalgo, 229 F. Supp. 2d 961, 967 (D. Ariz. 2002) (“Because the principle of uniqueness is without empirical support, we conclude that a document examiner will not be permitted to testify that the maker of a known document is the maker of the questioned document. Nor will a document examiner be able to testify as to identity in terms of probabilities.”); U.S. v. McVeigh, 1997 WL 47724 3 (D. Colo. 1997) (holding that a pattern recognition expert could not testify to ultimate source attribution for unknown handwriting evidence); United States v. Green, 405 F. Supp. 2d 104, 124 (D. Mass. 2005), *citing* United States v. Hines, 55 F. Supp. 2d 62 (D. Mass. 1999) (permitting testimony only regarding an examiner’s observations **without any** accompanying conclusions about the source of a projectile); United States v. Glynn, 578 F.Supp.2d 567 (S.D.N.Y. 2008) (noting that, given the lack of data supporting the discipline “ballistics lacked the rigor of science,” and limiting testimony of match to a conclusion of “more likely than not” instead of even “reasonable ballistics certainty” to ensure that “a conviction in a criminal case may not rest *exclusively* on ballistics testimony.”); United States v. Mouzone, 696 F.Supp.2d 536, 569 & 572-73 (D. Maryland 2009) (concluding that neither conclusions of absolute nor practical certainty of a match were  factually warranted and noting that the most accurate reading of recent cases on firearms examination is that courts have recognized “as the NRC Forensic Science Report clearly did, that if firearms toolmark evidence is characterized exclusively as ‘science,’ it has a long way to go before it legitimately can claim this status ... the concerns expressed by the NRC ought to be heeded by courts in the future”); United States v. Willock, 696 F.Supp.2d 536, 546 (D. Maryland 2010) (adopting report and recommendation of magistrate in Mouzone, and enforcing “a complete restriction on the characterization of certainty”); United States v. St. Gerard, APO AE 09107, at 4 (U.S. Army Trial Judiciary, 5th Judicial Circuit June 7, 2010) (the probative value of [the expert’s] proffered testimony that it would be practically impossible for a tool other than the seized AK-47 to have made the marks on the cartridge case would be substantially outweighed by the unfair prejudice associated with its unreliability.”), *available at* http://www.swgfast.org/Resources/ 101126\_US-v-Gerard.pdf; United States v. Jackson, 1:11-CR-411-WSD, (N.D. Ga. July 25, 2012) (disallowing expression of source attribution “to a practical certainty” and limiting to “consistent with”); Missouri v. Goodwin-Bey, No. 1531-CR00555-01 (Dec. 16, 2016) (limiting testimony “to the point this gun could not be eliminated as the source of the bullet.”). [↑](#footnote-ref-73)
74. *See* People v. Safford, 392 Ill. App. 3d 212, 225-26 (1st Dist. 2009) (foundation for admission of fingerprint evidence requires discussion of the points of comparison relied on); United States v. Saunders, 826 F.3d 363, 369-70 (7th Cir. 2016) (expert must disclose points of comparison and be subject to cross concerning said features). [↑](#footnote-ref-74)
75. *See* Garrett & Mitchell, “*How Jurors Evaluate Fingerprint Evidence*,” at 505 (“when the examiner admitted that fingerprint examiners sometimes make mistakes and that the identification in this case could thus be wrong, participants reduced their judgments about the likelihood that the defendant committed the crime, reduced their estimates of the probability that the defendant left his prints at the crime scene, and had less confidence in their guilt judgments”); AAAS, “*Forensic Science Assessments, A Quality & Gap Analysis*,” at 71 (recommending that examiners “take affirmative steps, when reporting their findings, to address … common misconceptions”). [↑](#footnote-ref-75)
76. *See* N.J. Schweitzer & Micheal J. Saks, “*The Gatekeeper Effect: The Impact of Judges’ Admissibility Decisions on the Persuasiveness of Expert Testimony*,” 15 Psychology, Public Policy, & Law 1 (2009) (concluding after multiple experiments that jurors are “less critical of and more persuaded by expert evidence when it was presented within a trial” potentially because they assume such evidence had already undergone vetting by judges). [↑](#footnote-ref-76)
77. *See e.g.,* Erin Murphy, “*What ‘Strengthening Forensic Science’ today means for tomorrow: DNA exceptionalism and the 2009 NAS Report*,” 9 Law, Prob., & Risk 7, 17 (2010) (“DNA evidence has changed how we think of conventional forensic evidence: DNA is the gold standard, the model forensic discipline”). [↑](#footnote-ref-77)
78. *See* People v. Pike, 2016 IL App (1st) 122626, ¶ 48 (1st Dist. 2016) (“[a] statistic is necessary to understand the significance of the inclusion as a potential contributor”). [↑](#footnote-ref-78)
79. *See e.g.,* *Commonwealth v. McKelvin*, 170 A.3d 1262 (Pa. Super. Ct. 2017) (statistic for a random match of “1 in 10 decillion from the Caucasian community, and 1 in 180 nonillion from the African American population”). [↑](#footnote-ref-79)
80. Cole, “*Forensics without uniqueness, conclusions without individualization: the new epistemology of forensic identification*,” 8 Law, Prob., & Risk at 249 (“The argument that individualization is somehow legitimate for disciplines for which it is more difficult to generate rarity estimates is fallacious; the difference pertains to the nature of the research effort, not the nature of the evidence. More than that, the argument is perverse: its result would be that the disciplines making claims of ‘individualization’ are not those with data to support those claims (because data would never support such extreme claims), but rather those disciplines which in their historical development have been indifferent to both data and probabilistic thinking.”); *see* D. Michael Risinger & Michael J. Saks, “*A House With No Foundation*,” Issues in Science & Technology, Vol. XX, Issue I (2003) (noting that, bolstered by judicial decisions admitting the testimony of practitioners without conducting searching inquiries or demanding foundational validity, forensic communities have dismissed research that might uncover limitations as a “net loss”); PCAST, “*Forensic Science in Criminal Courts*,” at 26 (explaining that decisions excluding DNA evidence actually forced practitioners to team with molecular biologists and develop rigorously scientific standards and practices); Paul C. Gianelli, “*Crime Labs Need Improvement*,” Issues in Science & Technology, Vol. XX, Issue I (2003) (opining that forgiving admissibility approaches to forensic science have resulted in a present reality where “clinical laboratories must meet higher standards to be allowed to diagnose strep throat than forensic labs must meet to put a defendant on death row”). [↑](#footnote-ref-80)
81. *See* Roach v. Union Pacific Railroad, 2014 IL App (1st) 132015, ¶ 55 (1st Dist. 2014); *see* Decker v. Libell, 193 Ill. 2d 250, 254 (2000) (even when assessing expert testimony “trial judge serves in a familiar role as ‘gatekeeper,’ barring testimony that is not sufficiently relevant or reliable to be admitted into evidence”); Verbance v. Altman, 324 Ill. App. 3d 494, 502 (2d Dist. 2001) (“In examining case law concerning the admissibility of an expert's testimony, particularly that by medical treaters, we concluded that the court frequently employs a totality-of-the- circumstances approach in determining whether the testimony is sufficiently reliable to be submitted to the jury. We noted that, as the gatekeeper of expert opinions disseminated to the jury, the trial court plays a critical role in excluding testimony that does not bear an adequate foundation of reliability”) (*citing* Soto v. Gaytan, 313 Ill. App. 3d 137, 147 (2d Dist. 2000)); People v. Taylor, 335 Ill. App. 3d 965, 973 (2d Dist. 2002) (“As the gatekeeper of expert opinions disseminated to the jury, the trial court must look behind the expert's conclusion and analyze the adequacy of the foundation” & “the trial court is not required to blindly accept an expert’s assertion that his or her testimony has an adequate foundation”). [↑](#footnote-ref-81)
82. The arguments made throughout this motion should be considered, not only in the sense that they impact the prejudice calculus of Rule 403, but also for their constitutional implications, because under the Due Process Clause of the Fourteenth Amendment “reliability is the linchpin of determining the admissibility” of evidence. *See* Manson v. Brathwaite, 432 U.S. 98, 114 (1977). Given the gross and unfounded speculation necessary for a fingerprint examiner to reach an “identification” conclusion, such testimony would fundamentally diminish the reliability of the proceedings against Mr. Sanchez, therefore imperiling his due process rights to a fair trial. [↑](#footnote-ref-82)