UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF TEXAS
DALLAS DIVISION

UNITED STATES OF AMERICA,	§	
	§	
Plaintiff,	§	
	§	
v.	§	**NO. 3:15-CR-102-D**
	§	
JERRY BROCK,	§	
	§	
Defendant.	§	

Motion to Exclude Expert Testimony

Defendant, Jerry Brock, by and through counsel, requests that the Court issue an Order excluding expert testimony relating to bloodstain pattern analysis pursuant to Federal Rule of Evidence 702 and *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993).

The government seeks to admit the testimony of Celestina Rossi, a blood spatter expert, to analyze bloodstain patterns from crime scene photographs taken at FCI Seagoville after the assault in this case. The government has provided defense counsel with a copy of a report written by Ms. Rossi that summarizes her findings. *See* (Brandon Sterling Bloodstain Report). It appears that Ms. Rossi concluded that Mr. Brock did not have any visible bloodstains on him after the incident because he ran out of the TV Room immediately after the incident occurred. *See* (Bloodstain Report at 5). However, according to the National Academy of Science and other leading experts, the field of bloodstain pattern analysis suffers from some of the worst systematic deficiencies in forensic science that impair its reliability for use in the courtroom. Furthermore, even if bloodstain pattern analysis were reliable, Ms. Rossi lacks the credentials necessary to provide an appropriate analysis. Since the expert testimony the government seeks to admit does not meet the criteria for admissibility set forth in *Daubert* and Rule 702, the testimony should be excluded.

I. Expert testimony is only admissible if its proponent demonstrates that it is both relevant and reliable.

Admissibility of expert testimony is governed by Federal Rule of Evidence 702, which provides that an expert may testify on an issue only if the expert is qualified and the evidence is relevant and reliable:

> (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
>
> (b) the testimony is based on sufficient facts or data;
>
> (c) the testimony is the product of reliable principles and methods; and
>
> (d) the expert has reliably applied the principles and methods to the facts of the case.

FED. R. EVID. 702. The determination of whether to admit expert testimony therefore centers on two considerations: reliability (whether the scientific knowledge is supported by "good grounds") and relevance (whether the testimony will assist the jury to understand or determine a fact in issue). *See Moore v. Ashland Chemical Inc.*, 151 F.3d 269, 276 (5th Cir. 1998). The government must establish that the evidence is reliable and relevant by a preponderance of the evidence. *Id.*

This motion primarily focuses on Rule 702(c) because bloodstain pattern analysis is systematically unreliable and thus the other 702 factors necessarily fail. Furthermore, even if this Court determines that bloodstain pattern analysis is reliable, Ms. Rossi should not be permitted to testify because she is not qualified.

Reliable expert testimony must be "ground[ed] in the methods and procedures of science." *Daubert*, 509 U.S. at 590. To make this determination, *Daubert* lists five non-exclusive factors for courts to consider when assessing the scientific validity or reliability of expert testimony:

> (1) Whether the theory or technique has been tested;
>
> (2) Whether the theory or technique has been subjected to peer review and publication;

(3) The known or potential rate of error of the method used;

(4) The existence and maintenance of standards and controls in the methodology; and

(5) Whether the theory or method has been generally accepted by the scientific community.

Id. at 593–95; *see also Moore*, 151 F.3d at 275. The Supreme Court later affirmed that the district court "may" consider the *Daubert* factors while performing its gate-keeping function but the reliability determination is meant to be "flexible." *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 150 (1999). But *Kumho Tire* "should not be misunderstood to grant open season on the admission of expert testimony by permitting courts discretionarily to disavow the *Daubert* factors." *Black v. Food Lion, Inc.*, 171 F.3d 308, 311 (5th Cir. 1999). Rather, the *Daubert* factors are ordinarily the starting point for the district court's admissibility determination. *See id.* at 311–12.

II. Bloodstain pattern analysis is patently unreliable because it lacks standard methodology, is highly unregulated, and is replete with pseudo-experts.

"The uncertainties associated with bloodstain pattern analysis are enormous." NAT'L RESEARCH COUNCIL OF THE NAT'L ACADS., STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD 179 (National Academies Press 2009) (available at https://www.ncjrs.gov/pdffiles1/njj/grants/228091.pdf) (hereinafter NAS Report). In 2005, Congress passed legislation calling for a review of forensic evidence. *See* Science, State, Justice, Commerce, and Related Agencies Appropriations Act of 2006, Pub. L. No. 109–109, 119 Stat. 2290 (2005). This resulted in the National Academy of Science Report, an "expose` of the shoddy forensics used in criminal proceedings." *Ex parte Robbins*, 478 S.W.3d 678, 696–97 (Tex. Crim. App. 2014) (Cochran, J., concurring). The NAS Report called into question the validity of many commonly-used forensic methods, including bloodstain pattern analysis, and has been widely cited by courts and scholars. *See, e.g.*, *Melendez-Diaz v. Massachusetts*, 557 U.S. 305, 318 (2009) (citing the NAS Report and

noting the risk of manipulation of forensic testing administered by law enforcement agencies); Geoffrey S. Mearns., *The NAS Report: In Pursuit of Justice*, 38 FORDHAM URB. L. J. 429 (2010) (analysis of former federal prosecutor recommending implementation of NAS report suggestions); Mark A. Godsey & Marie Alou, *She Blinded Me with Science: Wrongful Convictions and the "Reverse CSI-Effect"*, 17 TEX. WESLEYAN L. REV. 481 (2011) (noting the problems with juror expectations of forensic science).

Overall, the NAS Report identified several problems with multiple areas of forensic evidence, including inadequate or no research regarding rates of error, inadequate or no standards in forensic science education, the lack of mandatory certification for forensic examiners, and the lack of proficiency testing. (NAS Report at 5–9). Many of these problems spring from inadequate educational programs that "lack strong ties to our research universities and national science assets." (NAS Report at 14). Thus, many commonly-used forensic methods may be unreliable as evidence in court:

> [F]orensic science suffers from the basic problems of validity and reliability. Bite marks, blood spatter, ballistics, hair, fiber, and handwriting analyses share a similar defect—they are made of equal parts art and science, subjectivity and objectivity.

Jessica D. Gabel, *Forensiphilia: Is Public Fascination with Forensic Science a Love Affair or Fatal Attraction?*, 36 NEW ENG. J. ON CRIM. & CIV. CONFINEMENT 233, 258 (2010) (citing NAS Report at 86–87).`

With respect to bloodstain pattern analysis, the NAS Report explained that the field suffers many of the pitfalls of modern-day forensics—lack of regulation and lack of education. Bloodstain pattern analysis is a complicated study because "many sources of variability arise with the production of bloodstain patterns, and their interpretation is not nearly as straightforward as the process implies." (NAS Report at 177). As a result, bloodstain pattern analysts must possess "at a *minimum*" an "appropriate scientific education," which includes an "understanding of applied mathematics and the

use of significant figures" and "an understanding of the physics of fluid transfer." *Id.* (emphasis added). Even with this knowledge, interpreting bloodstain patterns is "difficult or impossible" in many cases. *Id.* at 177–78.

But the education provided to bloodstain pattern analysts is often woefully insufficient. Many analysts are trained through workshops, rather than formal science courses. The NAS Report urged the inadequacy of these workshops, which "teach the fundamentals of basic pattern formation" but are not a substitute for experience and experimentation. *Id.* at 178. These workshops are more appropriate to educate investigators and lawyers on how to recognize the importance of bloodstain patterns and to know when to hire a qualified expert. *Id.*; *see also* Craig M. Cooley, *Forensic Science and Capital Punishment Reform: An "Intellectually Honest" Assessment*, 17 GEO. MASON. U. CIV. RTS. L.J. 299 (2007) ("As any legitimately trained scientist will explain, these courses do not transform a non-science investigator into a bloodstain or firearms expert."). These courses are worth little more than putting the student in the position of an issue spotter—one who can only be trusted to see that a scientist should be called in.

The field of bloodstain analysis also lacks formal leadership, industry standards, and proficiency requirements. The NAS Report laments that the bloodstain pattern analyst professional organization, the International Association for Identification (IAI)—of which Ms. Rossi is a member—suggests 240 hours of course instruction but has no educational requirements for bloodstain pattern analysis certification. *Id.* Its superficially impressive course hours requirement is misleading as it does not require a background in physics or the scientific method. IAI's "emphasis on experience over scientific foundations seems misguided, given the importance of rigorous and objective hypothesis testing and the complex nature of fluid dynamics." *Id.*

As a result of the lack of appropriate education and regulation, the opinions of bloodstain pattern analysts are "more subjective than scientific." *Id.* This problem is amplified by the fact that cases

involving bloodstain pattern analysts are "prosecution driven or defense driven, with targeted requests that can lead to context bias." *Id.* The NAS Report concludes by noting that scientific studies do support some more basic aspects of bloodstain pattern analysis but "some experts extrapolate far beyond what can be supported." *Id.*; *see also Franco v. State*, 25 S.W.3d 26, 29 (Tex. App.—El Paso 2000) ("[W]e are dubious of the claim in this record that blood spatter evidence can . . . determine, perhaps, a sequence of events that occurred based upon the bloodstain evidence available at the scene. Such evidence . . . would likely carry exceptional weight and an aura of reliability which could lead the jury to conclusions based upon more on speculation than scientific explanation.").

Furthermore, recent information regarding the error rate of bloodstain pattern analysis is alarming. In 2014, the first study was conducted to determine a baseline error rate for the major method of bloodstain pattern recognition. TERRY LABER ET AL., NATIONAL INSTITUTE OF JUSTICE, FINAL REPORT, RELIABILITY ASSESSMENT OF CURRENT METHODS IN BLOODSTAIN PATTERN ANALYSIS (2014) (available at https://www.ncjrs.gov/pdffiles1/njj/grants/247180.pdf) (hereinafter Reliability Assessment). It included 27 participants who attempted to classify a range of blood spatter patterns. *Id.* at 2. The results varied widely. The study ultimately concluded that the baseline error rate was 13.1% for ridged surfaces and 23.4% for fabric surfaces. *Id.* at 68. However, the error rate was as high as 59% for certain types of stains on fabric surfaces. *Id.* at 69. But perhaps most strikingly, the study found that contextual information greatly affected classification decisions. *Id.* at 70. When study participants were shown a scenario that deliberately pointed to an incorrect classification, the proportion of misclassifications was "significantly higher:" 20–30%. *Id.* Thus, the study concluded that confirmation bias is a real problem in bloodstain pattern analysis and recommended that analysts be given minimal amounts of contextual information. *Id.* at 71. Importantly, the study also admitted that "[a]t this time

there is *no discipline standard* in the methodology employed by bloodstain pattern analysists." *Id.* at 16 (emphasis added).

The findings of the NAS Report and the Reliability Assessment seriously undermine confidence in the reliability of bloodstain pattern analysis. Bloodstain analysts are required to have little or no proficiency testing. There are no enforced standards for specific applications of the method to anything but basic bloodstain patterns. One may simply attend a series of weekend seminars and become an "expert." Furthermore, law enforcement and confirmation bias directly affect analysts' conclusions. Thus, while bloodstain pattern analysis is familiar to courts and law enforcement, it lacks standards grounded in the scientific method and had been strongly questioned by the scientific community. It should be excluded in this case.

III. Even if bloodstain pattern analysis is reliable, the government's expert is not qualified to testify because she lacks the appropriate education and her conclusions are tainted by context bias.

Even if bloodstain pattern analysis is sufficiently reliable to be used in court, the government's expert witness in this case is not qualified. As noted above, the NAS Report cited the lack of appropriate education as a serious concern in bloodstain pattern analysis. Experts must understand mathematics, the physics of fluid transfer, and possess an appropriate scientific education. (NAS Report at 177). Ms. Rossi does not have a scientific education. She has a background in law enforcement.

Since the NAS Report came out in 2009, the phenomena of "law enforcement experts" has been recognized. There are two types of witnesses who commonly appear to testify as bloodstain pattern experts: (1) scientists who are familiar with the traditional scientific principles and modern scientific developments related to bloodstain pattern analysis, and (2) law enforcement personnel who are trained via short courses on the modern approach to bloodstain pattern analysis but lack a

foundation in traditional scientific principles. Aaron D. Gopen & Edward J. Imwinkelried, *Bloodstain Pattern Evidence Revisited*, 45 N. 3 CRIM. LAW BULLETIN ART. 7 (2009). "More sophisticated scientific 'methodology is not taught in most bloodstain pattern analysis courses.'" *Id.* (quoting Ross Gardner, *Defining a Methodology for Bloodstain Pattern Analysis*, 56 J. Forensic Identification 549 (2006) (available at http://www.redorbit.com/news/science/578444/defining_a_methodology_for_bloodstain_pattern_analysis/index.html). Scientific experts and law enforcement experts use different methodology to conduct bloodstain pattern analysis. *Id.* Due to their "minimal scientific background," law enforcement experts may come to incorrect conclusions because they do not understand the nuances of alternative, scientifically plausible explanations for various bloodstain patterns. *Id.* Workshops offered on bloodstain pattern analysis are more appropriate for investigators and attorneys seeking training on issue-spotting than actual scientists. (NAS Report at 178).

Ms. Rossi's specialized training, while voluminous, consists of workshop-type seminars. She has attended ten bloodstain courses, ranging between three and seven days each. *See* (Celestina Rossi CV at Specialized Training). She has a degree in Business Administration and has completed a forensics course but she does not have a science-based education. *See* (Celestina Rossi CV at Education). And while Ms. Rossi is a member of the International Association for Identification, the NAS Report criticized that association for having "outwardly impressive" requirements but an improper emphasis on experience over scientific foundation. (NAS Report at 178). There is no evidence that Ms. Rossi has formal training in the scientific principles that make up the foundation of bloodstain pattern analysis. As the NAS Report noted, the physics of fluid transfer is a complicated subject and Ms. Rossi does not have training in that subject. *See* (NAS Report at 177).

Her lack of appropriate education is evidenced in the report in this case. It appears that Ms. Rossi made her assessment after viewing crime scene photos and hospital reports. (Bloodstain Report

at 1). She determined the direction Brandon Sterling went after the assault from the blood trail. *Id.* at 4–5. But she also concluded that the lack of blood on Mr. Brock could be explained by the report that he ran out of the room after the assault. *Id.* at 5. She provided no evidence or analysis to support this assertion. *See id.* She did not indicate that she performed any experiments to support her contention or explain why her analysis led her to that conclusion. *See id.* She simply looked at photographs. The NAS Report cautions that education via workshops is no substitute for "experience and experimentation" and Ms. Rossi apparently did not perform any tests to determine the likelihood that the assailant in this case would not have a spot of blood on him. *See* (NAS Report at 178).

Furthermore, context bias, which is noted both in the NAS Report and in the recent Reliability Assessment, is a factor in this case. Ms. Rossi was given information that indicated Mr. Brock assaulted Brandon Sterling, which was irrelevant to her assessment. She was told that Sterling and Brock were seen arguing before the assault and that Sterling said he saw Brock running away after the assault. (Bloodstain Report at 1–2). She was also given a video recording of an interview with Sterling in which he described the argument and named Mr. Brock as his attacker. *Id.* at 1. The only photos of individuals that were provided to her included photos of Brandon Sterling and photos of two shirtless males, one of which was Mr. Brock, who did not appear to have any blood on them. *Id.* at 1–5. Much of this contextual information was irrelevant to Ms. Rossi's assessment and likely influenced her analysis.

While she has attended many forensics conferences and seminars, Ms. Rossi does not have the foundation in traditional scientific principles that are required to fully understand the difficult and multi-faceted field of bloodstain pattern analysis. This is evidenced by the lack of testing or experimentation performed in this case. Moreover, her conclusions were likely influenced by unnecessary contextual information, a problem that has clearly been shown to affect the rate of error in

bloodstain pattern analysis. In short, while Ms. Rossi has appropriate credentials for an investigator, she is not qualified to be an expert.

Conclusion

The scientific community has expressed great concern over the use of bloodstain pattern analysis in litigation. Because the field is largely unregulated and the experts lack the necessary education, the risks and uncertainties of permitting bloodstain pattern evidence are enormous. But even if bloodstain pattern evidence is reliable, the government's expert is not qualified to give it. She lacks a foundation in the necessary scientific principles and training, receiving most of her education from weekend workshops—the very same workshops the NAS Report and other sources described as inadequate. Therefore, Mr. Brock respectfully submits that the Court should exclude the testimony of Celestina Rossi.

Respectfully submitted,

/s/ John M. Nicholson

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CERTIFICATE OF CONFERENCE

I, hereby certify that, I, John M. Nicholson, attorney for defendant, did not attempt to confer with John Boyle, the Assistant United States Attorney assigned to this matter, because of the nature of this motion.

/s/ John M. Nicholson
JOHN M. NICHOLSON

CERTIFICATE OF SERVICE

I hereby certify that on April 4, 2016, I electronically filed the foregoing document using the Court's CM/ECF system, thereby providing service on attorneys of record.

/s/ John M. Nicholson
JOHN M. NICHOLSON