DISTRICT COURT, WELD COUNTY, COLORADO Court Address: 915 10th Street, Greeley, CO 80631 Mail Address: P.O. Box 2038, Greeley, CO 80632 (970) 475-2400	DATE FILED: May 4, 2020 2:55 PM CASE NUMBER: 2018CR1767
PEOPLE OF THE STATE OF COLORADO, Plaintiff v. **BILLY HENDRIX**, Defendant	**▲COURT USE ONLY▲**
	Case Number: **18CR1767** **18CR1921** Div: **16**

ORDER DENYING MOTION TO EXCLUDE EXPERT TESTIMONY PURSUANT TO *PEOPLE V. SHRECK*

THIS MATTER comes before the Court on Defendant's motion to exclude expert testimony regarding DNA evidence pursuant to *People v. Shreck*, 22 P.3d 68 (Colo. 2001).

BACKGROUND

On June 15, 2018 officers were dispatched to First Bank in Erie on a report of an armed robbery. The bank manager described suspect as a dark-skinned male with black face paint of some sort covering his face and described the vehicle the suspect left in as a black Hyundai Sonata with an Idaho license plate. Surveillance video from the bank showed the suspect entering a black vehicle. Detective Wilson collected swabs from teller stations four and six at the bank. On June 18, 2018 Detective Wilson received information that a black Hyundai Accent with Idaho plates was stolen from Enterprise Rent-A-Car in Denver on June 15, 2018. FBI Agent Chris Pyler provided Detective Wilson with an incident report from Denver Police Department.

On June 25, 2018 Westminster Police Department located the stolen vehicle at Orchard Mall in Broomfield, CO. Detective Wilson collected swabs from the car's steering wheel and the gear shift and observed what he believed to be pieces from a face mask consistent with that described by the bank manager on the driver's seat and the front floorboards of the vehicle.

Detective Wilson collected the pieces of the face mask and provided the possible DNA evidence to Agent Pyler, who sent them to the Colorado Bureau of Investigations (CBI) laboratory for DNA testing.

CBI's DNA analyst Yvonne Woods used STRmix[1] to develop a DNA profile from the evidence collected from the vehicle. Ms. Woods entered the profile from DNA found on the pieces of face mask into the CODIS DAN database. The profile matched with Defendant's profile from the Colorado Offender Database. Defendant does not challenge the conclusions pertaining to the face mask.

Defendant objects to the conclusions pertaining to DNA analysis performed on the samples from the swabs of teller station six and the gear shifter. Specifically, Defendant argues that the determination of the number of contributors as applied to this case undermines the reliability of the conclusion that Defendant was included in the mixture and that the use of verbal equivalency statements used to characterize the strength of the inclusionary conclusion is unreliable.[2] Defendant asserts that the STRmix results indicated that Defendant was the major contributor to the sample from teller station six and that STRmix also indicated the DNA from either contributor to the sample could have originated from Defendant. Defendant argues that the STRmix results are unreliable because they are inconsistent with other DNA tests completed on the sample from teller station six, which other tests indicated that a female was the major contributor to the sample. Defendant also argues that the STRmix conclusion that either DNA contributor in the sample could have originated from Defendant is confusing, misleading, and lacking probative value and should

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[1] STRmix is a probabilistic genotyping software developed in 2011.
[2] These arguments were addressed in a recent order by another division of this Judicial District in *People v. Nunez*, 18CR515. The Court there concluded that the determination of the number of contributors and the use of verbal equivalency qualifiers are sufficiently reliable and admissible pursuant to *Shreck* and that any weaknesses in the methods go to the weight, not the admissibility of the evidence.

not be admissible pursuant to CRE 403. Finally, Defendant argues that CBI's application of STRmix is unreliable because of the high error rate disclosed in CBI's validation study.

LAW

A trial court determines the admissibility of expert testimony under CRE 702 which provides as follows:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise. The inquiry focuses on "the reliability and relevance of the proffered evidence and requires a determination as to (1) the reliability of the scientific principles, (2) the qualifications of the witness, and (3) the usefulness of the testimony to the jury." *People v. Shreck*, 22 P.3d 68, 70 (Colo. 2001); *People v. Campbell*, 2018 COA 5. The court must also evaluate the evidence under CRE 403, ensuring that the probative value is not substantially outweighed by the danger of unfair prejudice.

The court's inquiry "should be broad in nature and consider the totality of the circumstances of each specific case." *Shreck*, 22 P.3d at 77. Although the factors set forth in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 (1993), provide helpful guidance, a court need not consider any specific set of factors when determining the reliability of the proffered evidence. *Shreck*, 22 P.3d at 78. Concerns about conflicting opinions or whether a qualified expert accurately applied a reliable methodology go to the weight of the evidence, not its admissibility. *See Campbell*, ¶ 42. "Such concerns 'are adequately addressed by vigorous cross-

examination, presentation of contrary evidence, and careful instruction on the burden of proof.' "
Id. (quoting *Estate of Ford v. Eicher*, 250 P.3d 262, 269 (Colo. 2011).

If a party requests that evidence be subjected to a *Shreck* analysis, the trial court may, in its discretion, hold an evidentiary hearing. *Id.* at ¶ 41. "This discretion comports with the trial court's need to 'avoid unnecessary reliability proceedings in ordinary cases where the reliability of an expert's methods is properly taken for granted, and to require appropriate proceedings in the less usual or more complex cases where cause for questioning the expert's reliability arises.' "*Rector*, 248 P.3d at 1201 (quoting *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 152 (1999)). A hearing is not required if the court "has before it sufficient information to make specific findings under CRE 403 and CRE 702 about the reliability of the scientific principles involved, the expert's qualification to testify to such matters, the helpfulness to the jury, and potential prejudice." *Id.*

Shreck outlines the standards in determining the admissibility of expert testimony and the factors to be consider. *Id*., at 77. Under *Shreck*, before expert testimony may be admitted, a trial court must be satisfied that (1) the scientific or specialized principles underlying the testimony are reasonably reliable; (2) the expert is qualified to opine on such matters; and (3) the expert testimony will be helpful to the jury. *Id.*, at 70, emphasis added. The Court's reliability inquiry under CRE 702 should be broad in nature and consider the totality of the circumstances. *Id.,* at 77. The Court must also "apply its discretionary authority under CRE 403 to ensure that the probative value of the evidence is not substantially outweighed by unfair prejudice." *Id.,* at 70.

In determining whether the *Shreck* criteria have been met, a trial court may consider: (1) whether the technique at issue can and has been tested; (2) whether the theory or technique has been subjected to peer review and publication; (3) the scientific technique's known or potential rate of error, and the existence and maintenance of standards controlling the technique's operation; (4) whether the technique has been generally accepted; (5) the relationship of the proffered technique to more established modes of scientific analysis; (6) the existence of specialized literature dealing with the technique; (7) the non-judicial uses to which the technique is put; (8) the frequency and type of error generated by the technique; and (9) whether such evidence has been offered in previous cases to support or dispute the merits of a particular scientific procedure. *Shreck*, 22 P.3d at 77-78.

STRmix

STRmix is a software program that assists in interpreting DNA profiles and calculating statistics. The software takes the information developed by the analyst from the DNA profile and determines the possible combinations of the genetic information present, and how likely each of those combinations are. After this step, it can compare the evidence profile to a reference (or references) and calculate a statistic, the likelihood ratio, to assign a weight to that association.

STRmix software does not alter the underlying science or process behind DNA testing. The extraction of DNA from an item, its amplification by polymerase chain reaction (PCR), and the identification of short tandem repeats (STR) remains the same process DNA analysts have engaged in for decades. By reading the computerized amplification output (electropherogram or e-gram) generated during the initial phase of the analysis, the DNA analyst

can make a judgment about the number of contributors and factors in whether it's possible to assume the presence of any person – such as the female victim when analyzing vaginal DNA swabs. Determining the number of contributors to the sample is informed by interpreting the number of peaks and stutters observed in the e-gram – indicating the number of alleles present. Once those judgments are made, the analyst runs the e-gram, with the additional inputs – including the NOC, through the STRmix program, resulting in the calculation of the likelihood ratio (LR). The likelihood ratio explains the probability of the data given two competing hypotheses: the inclusionary/prosecutor hypothesis (that the suspect is the contributor) and the exclusionary/defense hypothesis (that an unknown, unrelated individual is the contributor). STRmix is able to utilize the information present in peak heights (representing the possible presence   of   an individual allele) observed on the e-gram, which then enhances the analyst's ability to differentiate true from false donors. In other words, probabilistic genotyping (PG) is able to analyze complex DNA mixtures using statistical methods and generate a probability (LR) that a match between the evidence and an individual is a number of times more probable than coincidence.

To assist the trier of fact in understanding the level of strength of the LR, CBI and other labs have adopted qualitative statements that convey the degree of support to be given to the numerical value. These statements are referred to as verbal scales, or verbal equivalence language.

The prosecution has provided support that Courts applying reliability tests have repeatedly admitted STRmix testimony and results. Considering factors similar to those outlined in *Shreck*, courts in at least Colorado, Illinois, Wyoming, New York, New Mexico, Minnesota, Michigan,

Connecticut, Florida, California, and the Virgin Islands have found probabilistic genotyping and STRmix sufficiently reliable to be admitted and submitted to the Jury. STRmix, which has been used by the FBI laboratory since 2015, is based on well-established mathematical principles, has been thoroughly vetted by the scientific community, and has been found to perform reliably in studies and casework.

STRmix was subjected to thorough validation studies by those responsible for developing the software and has been internally validated by at least 46 forensic laboratories in the United States, including the FBI, the Colorado Bureau of Investigation, the US Army Criminal Investigation Laboratory, and the California Department of Justice. Additionally, STRmix is also used in more than 20 labs in New Zealand, Australia, Great Britain, Canada, and Finland. Furthermore, STRmix has been peer reviewed. Over 50 peer-reviewed papers have been published in scholarly journals supporting STRmix's validity.

STRmix generally, and more specifically, CBI's determination of NOCs is accepted as reliable in the relevant scientific community: First, the algorithms used by STRmix to generate LRs is an established statistical sampling process known as Markov Chain Monte Carlo (MCMC). The MCMC method was first developed in the early 20th century and is a technique widely used in a variety of fields, including weather forecasting, computational biology and linguistics, genetics, engineering, physics, aeronautics, the stock market, and social sciences. 20. Defendant contends that the methodology used by CBI to identify the number of contributors to a mixture when the mixture appears to have at least four contributors is unreliable.

The evidence is relevant and helpful to the jury as it places the defendant inside the bank that was robbed. The verbal scale is helpful for the jury to understanding the level of strength of

the LR. *See* C.R.E. 401, 402. The probative value of the evidence is not substantially outweighed by its danger of unfair prejudice, confusion, misleading the jury, or undue delay or waste of time. *See* C.R.E. 403. The qualifications of the CBI analysts who performed the analysis, Yvonne "Missy"Woods, is not contested by the defendant.

The scientific principles underlying the proposed DNA testimony are not reasonably in dispute. The evidence and testimony in question has been the subject of many *Daubert/Frye/Shreck* type hearings throughout the nation over the last several years, with court regularly hearing the same testimony and repeatedly coming to the same conclusion. What is couched as the novel issue presented in the defendant's motion, is the analyst's interpretation of the egram and the correlation with the male to female ratio and the associated contributor percentage assigned in a mixture. This information comes from the analysts interpretation of the egram and the STRmix software. This is the NOC determination argument based on the egram interpretation, which may properly subject to rigorous cross examination as a matter of interpretation with the endorsed defense expert. Further, the NOC determination and the egram interpretation were addressed in the *Nunez* case. "This disagreement about the interpretation of the egram and whether an error was generated goes to the weight of the evidence as a question of fact and not to the admissibility of the scientific method of STRmix."

CONCLUSION

A *Shreck* hearing is not necessary since this court "has before it sufficient information to make specific findings under CRE 403 and CRE 702 about the reliability of the scientific principles involved, the helpfulness to the jury, and potential prejudice.". Since the

qualifications of the prosecution's expert is not being challenged for purposes of this motion the

court will address this issue contemporaneously during the testimony of the proposed expert.

Dated: May 4, 2020

IT IS SO ORDERED

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Marcelo A. Kopcow
District Court Judge