STATE OF NEW YORK
COUNTY COURT : COUNTY OF CHEMUNG

THE PEOPLE OF THE STATE OF NEW YORK,

Plaintiffs,

-against-

DECISION and ORDER
INDICTMENT NO. 2013-331

CASEY WILSON,

Defendant.

Pursuant to an August 9, 2018 Memorandum and Order from the Appellate Division, this Court held a posttrial Frye hearing on March 26, 2019 to consider the reliability of the TrueAllele Casework system as it was when DNA testing was performed on a pair of lavender gloves in 2013.

The People called as their first witness Dr. Mark Perlin, the chief scientific officer and chief executive officer of Cybergenetics, who also testified at trial in 2014. As outlined in his seventeen (17) page curriculum vitae (People's Exhibit #1), Dr. Perlin has a Ph.D. in Computer Science, an M.D. in Medicine, a Ph.D. in Mathematics, and a B.A. in Chemistry. In 1995, Dr. Perlin started Cybergenetics which uses computers to develop software and related systems/services for the interpretation of forensic DNA evidence. Essentially, the purpose of Cybergenetics was to replace and/or eliminate the human involvement in interpreting genetic markers by having computers calculate match statistics. As a result, Dr. Perlin created the TrueAllele Casework system wherein the electronic DNA data, known as electropherograms, are inputted into a computer, where genotypes can be inferred, and then comparisons between those genotypes can be made from the electronic data and reference samples, and thereafter calculate match statistics. According to Dr. Perlin, the TrueAllele Casework system provides a probalistic approach, offering better explanations of genotypes of each contributor of DNA. In short, Dr. Perlin explained that TrueAllele "assigns probabilities to every possibility based on the data" analyzed.

By the time the defendant's trial began in 2014, Dr. Perlin explained that TrueAllele had undergone more than 20 validation studies and there had been five (5) published peer reviewed articles regarding its reliability. Additionally, in 2011, the New York State Commission on Forensic Science determined TrueAllele to be reliable and approved its use by the New York State Police for forensic casework.

Dr. Perlin explained how the TrueAllele Casework system works in describing the principles of genotyping and match statistics by way of a Power Point demonstration, titled

"Computer Interpretation of Quantitative DNA Evidence," which is contained within People's Exhibit #2, and has been previously utilized in prior Frye hearings, as well as used as an instructional aid for scientists and attorneys. Essentially, Dr. Perlin testified that through the use of computer analysis, quantitative peak heights of alleles can be measured against other alleles present, wherein patterns and variations can be discerned to calculate statistical parameters to determine probabilities, particularly where there is DNA mixtures present from multiple contributors/individuals. The TrueAllele Casework system differs from the "human review" analysis of DNA evidence, which has been used in forensic laboratories for the past twenty-five (25) plus years, in that said approach applies "thresholds" to data peaks (or true alleles) over a certain level (i.e., 150 RFU), while disregarding data below the "threshold." According to Dr. Perlin, published studies by third parties have opined that the "human review" approach is susceptible to bias in the interpretation of mixture DNA evidence, while the TrueAllele method does not. With the use of TrueAllele, the computer interprets the DNA data, proposes a solution using all of the data, both above and below the threshold, and mathematically computes which genotypes are more or less probable. In using probalistic genotyping as TrueAllele does, Dr. Perlin testified that it makes "more use of the data," in that different probabilities are being calculated by utilizing the Bayes theorem and Markov chain Monte Carlo. These applications, which are well accepted in all fields of study, produce probabilities of different outcomes.

Using the TrueAllele Casework system, Dr. Perlin testified, consistent with his 2014 trial testimony, that a match between defendant and the DNA profile recovered from the inside of one of the (right) lavender gloves was 31.3 million times more probable than a coincidental match to an unrelated African-American person. Dr. Perlin also testified that the analysis of the other (left) lavender glove, the match statistics were calculated at 817,000 to defendant. These findings were summarized in Dr. Perlin's April 10, 2014 Supplemental Report. (People's Exhibit #3).

Dr. Perlin also discussed numerous validation studies undertaken regarding the TrueAllele Casework system, beginning with the Virginia TrueAllele Validation Study (People's Exhibit # 2 [B]), which he presented at the Academy of Forensic Sciences in February 2013, and subsequently published in March 2014. This study also lists seven (7) peer reviewed "validation papers" which validated the TrueAllele DNA mixture interpretation analysis, five (5) of which were cited in People's Exhibit #3. Also cited was a study published in the Journal of Forensic Sciences in 2011 which was done at the New York State Police Crime Laboratory, showing that the TrueAllele Casework System to be reliable. In sum, as of 2014, approximately 24 validation studies had been undertaken, five of which had been peer reviewed, including more than 50 lectures, the certification of over 100 students, with five admissibility rulings, and expert testimony given by Cybergenetics at 10 trials. Thus, Dr. Perlin testified that the TrueAllele Casework system, at the time of defendant's 2014 trial, was determined to be objective, accurate, sensitive (detects matches the "human method" cannot), specific (excludes false inclusions) and reproducible (interpretation gives the same answer to the same question). Accordingly, based upon the above, Dr. Perlin opined that TrueAllele computer genotyping is more effective than human review.

Also received into evidence in support of the People's contention that the TrueAllele

Casework system is reliable, and thus generally accepted under the Frye Standard, are the following items:

People's Exhibit #4 ("Background Reading"), explaining how TrueAllele works, which includes, *inter alia*, magazine articles;

People's Exhibit #5 ("Validation Paper"), consisting of peer reviewed publications on scientific studies that measures TrueAllele's reliability, including 2011 and 2013 New York State Police validation studies;

People's Exhibit #6[a] & [b] ("Validation Study"), comprising 25 DNA mixture studies performed internally;

People's Exhibit #7 ("Forensic Application"), referencing the use of TrueAllele by both the prosecution and the defense, and its use in 2005 by the New York City Medical Examiner to help identify victims of the World Trade Center disaster in 2001;

People's Exhibit #8 ("Regulatory Approval"), containing pre-2014 approvals from the New York State Forensic Science Commission as well as the Virginia Forensic Science Board;

People's Exhibit #9 ("Method Reports"), explaining the description of TrueAllele methods, standard operating procedures, error calculations and its technical details;

People's Exhibit #10 ("General Acceptance"), consisting of a bibliography of methods that TrueAllele relies on, including 443 scientific articles which have cited TrueAllele in their work;

People's Exhibit #11 ("Related Systems"), consisting of, *inter alia*, 5 articles and explaining the computer system that utilizes probabilities to resolve DNA mixtures;

People's Exhibit #12 ("Admissibility Rulings"), comprising 20 court decisions ruling on TrueAllele's admissibility, 8 of which were issued prior to defendant's 2014 trial;

People's Exhibit #13 & 14 ("Supplemental Reports"), dated April 19, 2013 and August 27, 2014, sent to the prosecution in People v. Wakefield, 47 Misc.3d 850, concerning Dr. Perlin's testimony at the Frye Hearing;

People's Exhibit #15 ("Legal Commentary"), containing articles written by defense attorneys and legal scholars prior to defendant's 2014 trial, commenting on TrueAllele;

People's Exhibit #16 ("Scientific Development"), comprising numerous scientific articles, five of which were published prior to defendant's 2014 trial, describing the evolution of TrueAllele technology, and;

People's Exhibit #17 ("Other Papers"), consisting of foundational papers regarding the

general acceptance of Bayes theorem, Markov chain Monte Carlo, and the MASTLAB programming language, all of which have been accepted as reliable in the scientific community.

Also called to testify by the People was Jay Caponera, Supervisor of the New York State Police Forensic Investigation Center, DNA section, who performed validation studies on the TrueAllele casework system in 2013 and 2014 (prior to his testimony at defendant's 2014 trial). His 2013 study involved low template analysis of DNA, as well as DNA profiles of two-person and three-person mixtures. The purpose of this validation study was to test the sensitivity of TrueAllele's software program to determine match statistics, along with testing for reproducibility, accuracy and specificity. Mr. Caponera's 2014 validation study involved four-person DNA mixtures, as well as mixtures that contained DNA from related individuals. Through the use of a Power Point presentation received into evidence as People's Exhibit # 2(c), Mr. Caponera's validation studies reference peer-reviewed publications, including those from 2004, 2011 and 2013 that were published in the Journal of Forensic Sciences by the New York State Police Crime Laboratory. Along with explaining how TrueAllele works, consistent with the testimony of Dr. Perlin, Mr. Caponera explained the principles of key validation metrics as they related to his studies: sensitivity, accuracy, reproducibility and specificity. Mr. Caponera testified that based on these principles, the TrueAllele Casework system was approved in 2011 by the New York State Commission on Forensic Science. In conclusion, Mr. Caponera opined that the TrueAllele Casework system is "well accepted" in the relevant scientific community.

No further witnesses were called at the hearing by the parties.

The parties were given an opportunity to submit post-hearing memoranda of law. Defendant's was received on April 19, 2019 and the People's submission was received on April 23, 2019.

CONCLUSIONS OF LAW

As explained in People v. Wesley, 83 N.Y.2d 417, 422 (1994), a Frye hearing ascertains the reliability of novel scientific evidence by determining "whether the accepted techniques, when properly performed, generate results accepted as reliable within the scientific community generally." Explained another way, in assessing whether a novel methodology meets the Frye standard, courts should be "counting scientists votes and not verifying the soundness of a scientific conclusion" (Parker v. Mobil Oil Corp., 7 N.Y.3d 434, 446-47), while at the same time keeping in mind that the procedure(s) in question need not be unanimously endorsed by the scientific community. See, People v. Middleton, 54 N.Y.2d 42, 49. The proponent of the proffered testimony can meet this burden through scientific or legal writings and judicial opinions. See, Parker v. Mobil Oil Corp., 16 A.D.3d 648, aff'd, 7 N.Y.3d 434.

In consideration of all of the testimony and documentary evidence received at the hearing, The Court hereby determines that at the time the DNA analysis was performed by Dr. Perlin/Cybergenetics in 2013, the TrueAllele Casework system was generally accepted within the scientific community and deemed to be reliable pursuant to, *inter alia*, validation studies and

peer review articles published in forensic science journals. Moreover, as testified to by Jay Caponera, and supported by the above-referenced exhibits, as of 2013, the TrueAllele Casework system met the key validation metrics of sensitivity, accuracy, reproducibility and specificity, so as to render it reliable and subject to use, beginning in 2011, in the New York State Police Laboratory as approved by the New York State Commission on Forensic Science DNA Subcommittee.

In essence, the proof presented at the Frye hearing substantially mirrors the evidence offered in support of the TrueAllele Casework analysis in People v. Wakefield, *supra*.

Therefore, The Court finds that the TrueAllele Casework system, as of 2013, was reliable and generally accepted within the relevant scientific community.

This shall constitute the Decision and Order of The Court.

Dated: May 1, 2019.

Hon. Christopher P. Baker
County Court Judge

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