D149798289

ENTERED
OCT 29 2026

COURT OF COMMON PLEAS
HAMILTON COUNTY, OHIO

STATE OF OHIO,	CASE NO. B 2502840
Plaintiff,	JUDGE ROBERT C. WINKLER
v.	**ENTRY DENYING DEFENDANT'S MOTION TO EXCLUDE EVIDENCE AND TESTIMONY REGARDING PROBABILISTIC GENOTYPING**
MORDECIA BLACK,	
Defendant.	

This matter came before the court for a hearing on Defendant, Mordecia Black's, Motion to Exclude Evidence and Testimony Regarding Probabilistic Genotyping. The court has considered the briefs, testimony of the witnesses, exhibits, law of Ohio, and being fully apprised in the premises and arguments of counsel finds said motion to be not well taken and for the reasons that follow hereby denies same.

BACKGROUND

Defendant seeks to have forensic evidence analysis known as TrueAllele DNA Probabilistic Genotyping ("TrueAllele") excluded from trial. Defendant advances several arguments challenging the reliability of TrueAllele probabilistic genotyping. Probabilistic genotyping was developed approximately 25 years ago. Defendant supports his arguments in favor of exclusion in reliance upon: 1) *Daubert v. Merrell Dow Pharmaceuticals, Inc.* 509 U.S. 579, 113 S.Ct. 2786 (1993), as embraced by the Ohio Supreme Court in *Miller v. Bike Athletic Co.* (1998), 80 Ohio St. 3d 607; 2) Evid.R. 702; 3) hearsay; 4)) Hamilton County Crime Lab's lack of certification to utilize TrueAllele; and 5) a cumulative violation of Defendant's right to a fair trial as guaranteed by the Due Process Clause. Each argument in support of exclusion will be discussed in turn.

Defendant's counsel provided a timeline of events occurring prior to the filing of the motion. As far as the court can determine, TrueAllele Probabilistic Genotyping has never been used as evidence in a criminal trial in Hamilton, County and has not been subject to a Daubert hearing.

The initial analysis of potential DNA sources of DNA conducted by the Hamilton County Crime Laboratory yielded inconclusive results as to the existence of Defendant's DNA at the crime scene. Detectives submitted specimens for additional review to Cybergenetics Inc, by their TrueAllele Caseworks computer software program because the Hamilton County Crime Laboratory has not been certified by Cybergenetics to conduct TrueAllele analysis. True Allele utilizes the DNA samples taken by the local investigators and conducts computerized analysis known as Probabilistic Genotyping. The analysis is designed to analyze degraded DNA and untangle DNA mixtures containing an unlimited number of contributors that are too complex for human analysis and would otherwise result in an inconclusive result. Probabilistic genotyping is a class of forensic software that uses math, statistics, and scientific principles, to interpret DNA data or look at DNA signals, and determine the DNA contributors. In this case it was determined there were two DNA contributors. TrueAllele is one of the probabilistic DNA-based software that exists and is designed to utilize all the DNA data, look at every aspect of the DNA, separates out the DNA contributors to make sure it is not more than one person's DNA and then compares the separated DNA to known DNA profiles to calculate DNA statistics called likelihood ratios. The TrueAllele analysis has indicated a strong likelihood that Defendant's DNA was on a variety of items found at or near the crime scene.

TESTIMONY

The state called Jennifer Bracamontes in support of admission of TrueAllele Probabilistic Genotyping. She has been employed by Cybergenetics for 15 years, a Pittsburg, Pennsylvania based technology company that developed DNA interpretation software. As a case manager she is responsible for analyzing DNA data through the TrueAllele interpretation computer software, summarizing the reports, testifying about those reports, performing validation studies and other tests to assure the TrueAllele system is working as expected.

Prior to joining Cybergenetics, Bracamontes earned both a Bachelor of Science degree in biology and a Master of Science degree in forensic science from Duquesne University graduating with honors. Her thesis was prepared during her DNA laboratory work at Duquesne University. She is certified for operating, understanding and

presenting TrueAllele evidence. She is also a certified reporting scientist in that she was taught how to present TrueAllele results to others. She is also the co-author of four published peer-reviewed studies validating TrueAllele. She prepared an additional 13 reports, the majority of which concerned TrueAllele validations. She explained not all reports get published but are used by other scientists in the field using TrueAllele. She has given nearly 40 presentations at scientific conferences on DNA interpretation and has taught over 20 courses on DNA interpretation typically at crime laboratories. She has personally analyzed DNA using TrueAllele in 1,150 criminal cases and testified in 77 of those cases in 22 states. The testimony was given in a variety of settings, including Daubert hearings, grand jury proceedings, preliminary hearings, criminal trials and post-conviction proceedings.

Bracamontes went on to explain TrueAllele is one of 10 other probabilistic DNA-based software that exist across the globe. It functions by using all the DNA data, by looking at every aspect of the DNA, separates out the DNA contributors present to make sure not more than one person's DNA is present, then compares separated out DNA with known reference profiles to calculate DNA statistics called likelihood ratios. TrueAllele has been subjected to over 40 validation studies, 9 of which have been published in peer-reviewed journals, testing the process empirically on data.

Bracamontes went on to describe the biology of DNA. The human body contains cells, most of which have a nucleus that contains all of our DNA. DNA is stored as chromosomes. Scientists can unwind the chromosomes to specific locations of DNA where the DNA letters are written as text. Some of those locations ("locus") are useful in forensic identification. Thus, the locus is the specific DNA region being examined. The locus contains a DNA sequence. A short tandem repeat is the region used in forensics for identification. The beginning and ending DNA sequences are the same for everyone. Somewhere in the middle there is a short sequence repeated some number of times in a row or in tandem. DNA labs can measure the length of the DNA fragment to count the number of repeats. Absent an identical twin those repeats are unique to an individual. The number of times the fragment repeats is called an allele value. TrueAllele looks at 15 to 20 loci for its interpretation. A DNA genotype is a pair of alleles at a DNA locus. It's a pair because everyone gets half their DNA from their mother and half from their father.

There will always be two alleles at any given DNA locus. When there is a mixture of DNA there are a different number of allele pairs measured at a locus for each individual's DNA.

TrueAllele software compares those allele pairs to interpret the DNA data generated by a DNA laboratory. TrueAllele separates the genotypes when there is more than one DNA contributor. DNA data is uploaded and the software proposes different combinations of allele pairs and compares them against the data. The computer considers the number of contributors and tries hundreds of thousands of combinations to explain the data and provide answers that are better than others. The TrueAllele analysis provides a probability percentage of a good match. The next step is to calculate a likelihood ratio or DNA statistics. The likelihood ratio is a comparison of the probability of the evidence match and a person's allele pair versus the chance of the probability that it's from an unrelated person. TrueAllele also provides exclusionary likelihood ratios. The likelihood ratio determines how much support there is that a person contributed the DNA versus the chance it was contributed by someone else.

TrueAllele uses a statistical sampling method called Markov Chain Monte Carlo which does not impose the same patterns every time it runs. Using reproducibility, the variation between each computer run can be measured. The results are not always mathematically the same. It is expected that the exact livelihood ratio won't be the same for every computer run. The observed error rate for TrueAllele is .005 percent. Stated another way the chance of a false positive is less than one in a million. The observed error rate for manual DNA review rates is around 2 percent.

In one example of the forensic application of TrueAllele, in 2006, the Chief Medical Examiner of New York requested Cybergenetics participation with the reanalysis of 18,500 samples of victim remains and 2700 missing persons related to the 2001 World Trade Center terrorist attack. TrueAllele was used to evaluate heavily damaged and charred human remains and compare those remains with family members through personal effects belonging to those missing persons.

TrueAllele has also been employed in numerous criminal post-conviction proceedings resulting in at least 15 exonerations.

Cybergenetic's TrueAllele is compliant with validation standards and guidelines for probabilistic genotyping. The Scientific Working Group on DNA Analysis Methods ("SWDAM") is a group of forensic scientists across the country that generate guidance documents for DNA technique, analysis, interpretation, validation and guidance for validating probabilistic genotyping systems such as TrueAllele. TrueAllele is in compliance with SWDAM's established standards. TrueAllele is also compliant with the American Academy of Forensic Science Standards Board which publishes standards for a wide variety of forensic sciences and lab processes including standards for validating probabilistic genotype systems. TrueAllele is generally accepted by the scientific community in terms of forensics and probabilistic genotyping.

Bracamontes discussed the programing language and mathematical methods employed by TrueAllele. The computer program uses a programing language called MATLAB to write the code and instructions for TrueAllele. The program uses Bayesian Probability Modeling which has been employed since the 1700s. It also uses Markov Chain Monte Carlo statistical method developed in the 1950s employed to solve high-level problems. These methods are accepted as reliable in the scientific and mathematics community.

TrueAllele's source code is proprietary information and thus a protected trade secret. In Bracamontes' opinion, it is unnecessary to have the source code to validate TrueAllele. In her time as an employee at Cybergenetics, Bracamontes has never had access to the software's source code but has conducted validation studies where she knowns the contributors and the DNA samples to be compared along with the composition amounts to be analyzed and observing inclusionary statistics. This is borne out by other independent validation studies in the record.

The admissibility of TrueAllele has been challenged fifty-three times in 17 states and five federal districts. It was admitted fifty-three times despite the challenges and ultimately affirmed by 9 appellate courts. Cybergenetics has ten certified laboratories that use TrueAllele in their labs including the Cuyahoga County lab in Cleveland, Ohio. Over 600 agencies have submitted data for examinations to Cybergenetics for analysis. Those agencies have included police groups, prosecutors, defense attorneys and innocence

groups. In addition to Bracamontes 'experiences, Cybergenetics, through others certified in the use of TrueAllele, has analyzed DNA data in more than 1500 court cases across 48 states.

Nathaniel Adams was called by Defendant to testify from the perspective of one versed in the field of computer science for the purpose of challenging the reliability of the software utilized by TrueAllele Probabilistic Genotyping. TrueAllele's source code is proprietary and therefore protected from disclosure. Cybergenetics has a substantial pecuniary interest in protecting its software. Cybergenetics permitted Adams, subject to non-disclosure documents along with other stipulations, to examine the source code. He examined the code, but that was not helpful in that he could not run the software program. The software contains 170000 lines of code.

Adams earned a Bachelor of Science Degree in computer science from Wright State University and is working toward his master's degree in computer science. His thesis is a work in progress and concerns DNA mixture interpretation. He has co-authored a published article for the Champion a magazine for the National Association of Criminal Defense Lawyers on the topic of probabilistic genotyping. He has testified as an expert approximately 30 times in the United States and internationally. He was deemed an expert in computer science by the court. The gist of Adams' testimony is that TrueAllele' software has not been independently validated by computer software experts and thus unreliable.

Adams' testimony agrees with and tracks a letter dated November 18, 2021 from the Institute of Electrical and Electronic Engineers ("IEEE-USA") to the National Institute of Standards and Technology's ("NIST") request for comment on NIST's DNA Mixture Interpretation. IEEE-USA represent approximately 150,000 engineers, scientists and allied professionals in the United States. The letter summarizes IEEE-USA' concerns and reservations.

Adams testified to his apprehensions surrounding the development of TrueAllele probabilistic genotyping software and its lack of demonstrated concordance with accepted software engineering standards and principles. In 2016 Adams reviewed a probabilistic genotyping system that analyzed DNA mixture data known as New York's

Forensics Statistical Tool. He was given access to the source code and other relevant software development materials in order to review the entire system. Certain errors and behaviors were observed in the software that affected the likelihood ratio calculations for that system. TrueAllele has made more than 100 alterations to its software. There is nothing in the record to indicate those alterations affected TrueAllele's efficacy in generating likelihood ratios.

Adams agrees with the IEEE assessment that probabilistic genotyping utilizes a form of artificial intelligence and due to the importance of its societal implications, the software necessarily must be verified and validated in accord and compliance with engineering and software standards. Moreover, in Adams' view, TrueAllele lacks adequate verification and validation because it is lacking technical, financial and managerial independence. He went on to explain managerial independence looks at the reporting structure is whether the boss is overseeing both the validation team and development team. Financial independence concerns whether the validation and verification organization has its budget overseen by the development team. Technical independence concerns whether the validation and verification are reliant on the development team for technical support. Adams' implication of conflict of interest is clear.

CONCLUSION

To determine whether testimony describing the results of probabilistic genotyping relevant to this case is admissible, the analysis begins with Evid.R. 702, which states:

> A witness may testify as an expert if the proponent demonstrates to the court that it is more likely than not that all the following apply:
>
> (A) The witness testimony either relates to matters beyond the knowledge or experience possessed by lay persons or dispels a misconception common among lay persons;
>
> (B) The witness is qualified as an expert by specialized knowledge, skill, experience, training, or education regarding the subject matter of the testimony;
>
> (C) The witness' testimony is based on reliable scientific, technical or other specialized information and the expert's opinion reflects a reliable application of the principles and methods to the facts of the case.

> To the extent that the testimony reports the result of a procedure, test, or experiment, the testimony is reliable only if all of the following apply:
>
> (1) The theory upon which the procedure, test, or experiment is based is objectively verifiable or is validly derived from widely accepted knowledge, facts or principles;
>
> (2) The design of the procedure, test, or experiment reliably implements the theory;
>
> (3) The particular procedure, test or experiment was conducted in a way that will yield an accurate result.

There is no uncertainty concerning Bracamontes' qualifications to testify as an expert in that her testimony was related to a subject beyond the knowledge or experience of lay persons and she possesses specialized knowledge, skill, experience, training, and education concerning TrueAllele Probabilistic Genotyping and its application to mixed DNA analysis. Evid.R. 702 (A) and (B).

Therefore, the issue remains whether Bracamontes' testimony is based on reliable scientific, technical or other specialized information and her testimony reflects a reliable application of the principles and methods to the facts of the case. In *Daubert v. Merrell Dow Pharmaceuticals, Inc.* (1993), 509 U.S. 579, the United States Supreme Court discussed the issue of when expert scientific testimony is relevant and reliable. It held under Fed. R. Evid. 702, expert scientific testimony is admissible if it is reliable and relevant to the task at hand. In determining reliability, the Daubert court directed the trial courts to assess whether the reasoning or methodology underlying the testimony is scientifically valid. In evaluating the reliability of scientific evidence, several factors are to be considered: (1) whether the theory or technique has been tested, (2) whether it has been subject to peer review, (3) whether there is a known or potential rate of error, (4) whether the methodology has gained general acceptance. Although the factors may aid in determining reliability, the inquiry is flexible.

The court concludes the testimony and science as it concerns TrueAllele DNA analysis is premised upon reliable, technical and scientific specialized information. Evid.R. 702 (3). TrueAllele is founded on well established statistical principles and has been objectively validated through multiple internal and external validation studies utilizing single source and multiple source DNA with verifiable results. TrueAllele has

been subject to numerous peer reviewed articles. TrueAllele consistently yielded observable low error rates on single source and multiple source DNA submissions.

TrueAllele's methodology has gained general acceptance within the forensic science community. There are 10 crime laboratories located across the United States certified to utilize TrueAllele DNA analysis one of which is the Cuyahoga County Ohio crime laboratory.

True Allele results have been admitted across the United States after 53 admissibility hearings comprised of 17 states and 5 federal districts. Of those cases, 17 went on to be affirmed by an appellate court.

The FBI uses a probabilistic genotyping system known as STRMix. In certain circumstances, the FBI submits DNA for analysis by TrueAllele. The Sixth Circuit Court of Appeals reviewed the admissibility of STRMix in *United States v. Gissantaner*, 990 F.3d 457 (6th Cir. 2021). The court found STRMix to be the "product of reliable principles and methods."

The testimony of Mr. Adams from the perspective of computer science in the court's view is speculative at best. It rests, without evidentiary support, on the assumption that those versed in computer science have not had the opportunity to test or validate True Allele's software source code. In his view, despite forensic science's numerous validation studies, peer reviews, and its general acceptance in the scientific community, and courts across the United States, TrueAllele's reliability remains suspect.

The court can find nothing in the record to support Defendant's alternative arguments in favor of excluding the TrueAllele results premised upon hearsay; a cumulative due process violation; and Hamilton County, Ohio's crime laboratory's DNA extraction of mixed DNA sample. In this case, it merely extracted the DNA mixture and provided it to Cybergenetics for further analysis.

In closing, it is worth noting, "A trial court's role in determining whether an expert's testimony is admissible under Evid.R. 702(C) focuses on whether the opinion is based upon scientifically valid principles, not whether the expert's conclusions are correct or whether the testimony satisfies the proponent's burden of proof at trial." *Miller v. Bike*

Athletic Co. (1998), 80 Ohio St.3d 607, syllabus. A judge decides whether the expert is reliable, the jury decides whether the experts are correct.

The court finds Defendant's motion to exclude evidence derived from the analysis of DNA by TrueAllele to be not well taken and it is hereby denied. The State has established TrueAllele satisfies the prerequisites of Evid.R. 702 and the factors established by *Daubert v. Merrell Dow Pharmaceuticals, Inc. and Miller v. Bike Athletic Co.*

IT IS SO ORDERED

Winkler, J

JUDGE ROBERT C. WINKLER

10-29-26

To the Clerk, please serve via US Regular mail to:

Robert Jones

119 E. Court St.

Cincinnati, OH 45202

Elyse Deters

230 E. Ninth St.

Suite 4000

Cincinnati, OH 45202