IN THE

SUPERIOR COURT OF PENNSYLVANIA

PITTSBURGH DISTRICT

_____

NO. 25 WDM 2016

_____

COMMONWEALTH OF PENNSYLVANIA,
Respondent,

V.

MICHAEL ROBINSON,
Petitioner.

_____

BRIEF IN RESPONSE TO PETITION FOR REVIEW

_____

Appeal from the Order dated February 4, 2016 refusing to certify for appeal the trial court's discovery Order dated December 7, 2015 at No. CC 20130007777 in the Court of Common Pleas of Allegheny County, Pennsylvania, Criminal Division

_____

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COUNTER STATEMENT OF JURISDICTION

Presently under review is the Petitioner's Petition for Review, an appeal from the Order denying his Application for Amendment to Include Certification of the Interlocutory Discovery Order Issued on December 7, 2015. Where, as here, a trial court denies a request for amendment to include the language of 42 Pa. C. S. section 702(b) **Interlocutory appeals by permission**[1], the next step to obtaining appellate review is set forth in the Comment to Pa. R.A.P. 1311(d). The comment provides that if the trial court "refuses to amend its order to include the prescribed statement [of section 702(b)], a petition for review under Chapter 15 of the unappealable order of denial is the proper mode of determining whether the case is so egregious as to justify prerogative appellate correction of the exercise of discretion by the lower tribunal."

Pursuant to Pa. R.A.P. 1501 (a)(4), 42 Pa. C.S.A., which provides that an appeal from an order refusing to certify an order for immediate appeal is within the scope of that chapter, the Petitioner's instant Petition for Review challenging the Honorable Jill Rangos' denial of certification is properly before this Court.

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[1] **(b) Interlocutory appeals by permission.--**When a court or other government unit, in making an interlocutory order in a matter in which its final order would be within the jurisdiction of an appellate court, shall be of the opinion that such order involves a controlling question of law as to which there is substantial ground for difference of opinion and that an immediate appeal from the order may materially advance the ultimate termination of the matter, it shall so state in such order. The appellate court may thereupon, in its discretion, permit an appeal to be taken from such interlocutory order.

42 Pa. C. S. § 702 (b).

COUNTER-STATEMENT OF THE QUESTION INVOLVED

I. WHETHER THIS COURT SHOULD DENY THE PETITIONER'S PETITION FOR REVIEW BECAUSE THE UNDERLYING INTERLOCUTORY ORDER PETITIONER SEEKS TO APPEAL DOES NOT INVOLVE A CONTROLLING QUESTION OF LAW AS TO WHICH THERE IS A SUBSTANTIAL GROUND FOR DIFFERENCE OF OPINION, IMMEDIATE APPEAL FROM THE ORDER WILL NOT MATERIALLY ADVANCE THE ULTIMATE TERMINATION OF THIS MATTER, AND THE TRIAL COURT'S REFUSAL TO AMEND WAS NOT EGREGIOUS?

COUNTER-STATEMENT OF THE CASE

The Petitioner in the above-captioned case is charged with two counts of criminal homicide and related charges in connection with the killings of Lawrence Short and Tyrone Coleman on or about May 6, 2013. A black bandana that is believed to belong to the Petitioner was recovered from the scene. The Commonwealth seeks to introduce at trial DNA evidence that utilizes the TrueAllele Casework System ("TrueAllele"). TrueAllele, a probabilistic genotyping computer system that interprets DNA evidence using a statistical model, was created by Dr. Mark Perlin, who is a Commonwealth expert witness. Dr. Perlin's corporation, Cybergenetics, owns the TrueAllele software and its proprietary source code. The source code is a list of instructions in the form of a computer program that is translated into computer-readable software. The source code gives the computer step-by-step instructions that describe what to do to data that is fed to the computer. The TrueAllele source code is a trade secret of Cybergenetics. Application of the TrueAllele program to a DNA mixture found on the bandana described above produced a DNA match to the Petitioner.

On January 23, 2015, counsel for defendant, Kenneth J. Haber, Esquire and Noah M. Geary, Esquire, filed a Motion for Discovery seeking, *inter alia*, the source code of the TrueAllele program. The Commonwealth filed an Answer thereto on March 26, 2015 refusing to produce the source code because it is a trade secret of Cybergenetics. A hearing was held before the Honorable Jill E. Rangos on March 27, 2015 at which time the bulk of the defense discovery requests were resolved. The court did not order disclosure of the source code. The Commonwealth filed a Supplemental Answer to the Motion for Discovery on April 14, 2015 that included as an Exhibit the Declaration of Dr. Perlin in support of the claim of a trade secret. Hearings on the

Motion for Discovery were held before Judge Rangos on October 9, 2015 and November 19, 2015.

On December 7, 2015, this Court issued an Order denying Petitioner's request for the source code. Petitioner then requested Certification of the December 7, 2015 court order to facilitate an immediate appeal from what is an otherwise interlocutory, non-appealable order. Where, as here, a litigant seeks immediate appellate review of an otherwise interlocutory order in the Superior Court, 42 Pa. C.S. § 702(b) provides that if the trial court believes the interlocutory order "involves a controlling question of law as to which there is substantial ground for difference of opinion and that an immediate appeal from the order may materially advance the ultimate termination of the matter, it shall so state in such order." On February 4, 2016, the Honorable Jill E. Rangos denied the request for certification. On March 7, 2016, counsel for Petitioner filed a Petition for Review, seeking this Court's review of the Order denying certification. The Commonwealth's responsive Brief follows.

FACTUAL HISTORY

At the discovery hearing on October 9, 2015, Dr. Ranajit Chakraborty testified for the defense. Dr. Chakraborty has a Ph.D. in biostatistics and population genetics, and he is currently a professor of molecular and medical genetics and is the director of the Center for Computation Economics at the Institute of Applied Genetics at the University of North Texas. Discovery Hearing Transcript, 10/9/2015 ("DHT1"), at 31, 21. Dr. Chakraborty stated that he has testified as an expert witness in DNA identification more than two hundred times. *Id*. at 29.

Dr. Chakraborty was a member of the New York DNA Subcommittee from 1995 through 2011, when he resigned. *Id*. at 61-63. Dr. Chakraborty voted to approve TrueAllele for case work in New York state labs. *Id*. at 68. He testified that in voting for approval of TrueAllele, he did not need to examine the source code for TrueAllele. *Id*. at 71. Dr. Chakraborty testified he did not have his own propriety software. He testified that all of the software he had ever written was free to everyone. *Id*. at 71-72.

Dr. Chakraborty testified he created MPKin FS software. *Id*. at 73-74. He stated he would give the software to anyone who asked. *Id*. at 75. Dr. Chakraborty acknowledged however, that in a prior proceeding he testified that MPKin FS is not free and is licensed for a fee to the state of New York. *Id*. at 86-87. Dr. Chakraborty acknowledged he testified in a New York state proceeding that the source code of MPKin FS was published as supplemental data in the scientific journal "Investigative Genetics". *Id*. at 88-89. Dr. Chakraborty testified he believed most of the source code was contained in the text of the article itself. *Id*. at 90. However, neither the article, admitted as Commonwealth Exhibit 1, nor the six page supplemental appendix to the article, admitted as Commonwealth Exhibit 2, contained the source code. *Id*. at 92. Concerning this discrepancy, Dr. Chakraborty maintained that the source code was not published but that instructions in the article could be translated into a computer language. *Id*. at 95.

Dr. Chakraborty testified he would be willing and able to evaluate the validity of the TrueAllele methodology without the source code. He stated he could use his own data on the TrueAllele system. He acknowledged that Dr. Mark Perlin makes TrueAllele available to anyone for this purpose. *Id*. at 122-123, 131, 132, 136-137.

Dr. Chakraborty testified that the TrueAllele Casework System was validated in an independent study in the September 2015 issue of the "Journal of Forensic Science". *Id*. at 145. Dr. Chakraborty acknowledged it is not unusual for the owner of software being validated to offer assistance to those validating the software. *Id*. at 146. Dr. Chakraborty acknowledged that seven studies validating the True Allele system, from December 2009 through September 2015, were completed without examination of the TrueAllele Casework System source code. *Id*. at 149. Dr. Chakraborty did not express his concern or criticism of any of these validation studies of TrueAllele. *Id*. at 153.

Dr. Chakraborty testified he was involved in a case, specifically David Balding's Likelihood Ratio Program, where source code was produced and was found to contain errors. *Id*. at 154-155, 167. Dr. Chakraborty testified that the second vote of the New York DNA Subcommittee to approve TrueAllele involved a DNA mixture but that mixture was not as complex as in the present case, nor did it involve low quantities of DNA. *Id*. at 176. Had the mixture under review been as complex, Dr. Chakraborty would not have voted for the approval of TrueAllele. *Id*. Dr. Chakraborty characterized the mixture in this case as "complex" because there were three contributors. *Id*. at 179. Dr. Chakraborty testified it was his understanding that in the present case there was a low level of DNA present for testing. *Id*. He characterized low levels as one hundred picograms or less. *Id*. at 181. Dr. Chakraborty testified that if he knew TrueAllele was going to be used for complex DNA mixtures he would not have voted for its approval. *Id*. at 191. At the time he approved TrueAllele, he did not object based on what he knew then. *Id*. at 192.

At the second discovery hearing on November 19, 2015, Attorney John McIlvaine, a partner in the Webb Law Firm, testified for the defense as an expert in the area of patent law and intellectual property. Discovery Hearing Transcript, 11/19/2015 ("DHTII"), 11/19/2015 at 7. Attorney McIlvaine testified that a remedy for a party's unwillingness to produce source code is the court's issuance of a Protective Order, and that a protective order could be crafted in this case to protect the source code at issue. DHTII at 12-13, 20-21.

Dr. Perlin has testified as an expert witness in over 20 trials. Courts accepting TrueAllele evidence include state courts in California, Louisiana, New York, Ohio, Pennsylvania and Virginia, federal courts of the Eastern District of Virginia and the United States Marine Corps, and internationally, in Northern Ireland and Australia. Cybergenetics thoroughly tests its software before it is released. Over twenty internal validation studies have been conducted to establish the reliability of the TrueAllele method and software. See Declaration of Dr. Mark Perlin, filed as Exhibit 1 to Commonwealth's Supplemental Answer to Motion for Discovery, 4/14/2015.

Over a dozen crime laboratories have purchased the TrueAllele system for their own use (DHTII at 122), and 4 labs currently use the system (*Id*. at 123). According to the federal government, all crime labs in the United States will, in the next 5 to 10 years, be using a probabilistic genotyping program. *Id*. TrueAllele has been used in approximately five hundred criminal cases, including for the identification of human remains in the World Trade Center bombing. DHTII at 45. Over thirty studies determining the reliability of TrueAllele have been conducted, seven of those having been published in peer-reviewed scientific journals, for both laboratory-generated and

DNA samples from real court cases. *Id*. at 50. In the peer-review process, scientists describe their research methods, results and conclusions in a scientific paper, and submit these findings to a journal for publication. That journal's editor has at least two independent and anonymous scientists in the field read the paper, assess its merits, and advise the editor concerning the suitability of the manuscript for publication. At that point, the paper is accepted, rejected, or sent back to the authors for revision and more review. *Id*. at 58. The peer review process does not require examination of the source code to assess the validity or reliability of the TrueAllele program. *Id*. at 60.

SUMMARY OF THE ARGUMENT

The Commonwealth respectfully submits that the Petition for Review filed by Petitioner Robinson should be denied. Instantly, the Order denying certification as appealable of the Order denying the discovery motion for the source code was proper, and the underlying interlocutory order petitioner seeks to appeal does not involve a controlling question of law as to which there is a substantial ground for difference of opinion, immediate appeal from the order will not materially advance the ultimate termination of this matter, and the trial court's denial of certification was not egregious. Accordingly, the Commonwealth respectfully submits that the trial court's Order denying Petitioner's Application for Amendment to Include Certification of the Interlocutory Discovery Order Issued on December 7, 2015 should be upheld.

ARGUMENT

I. THIS COURT SHOULD DENY THE PETITIONER'S PETITION FOR REVIEW BECAUSE THE UNDERLYING INTERLOCUTORY ORDER PETITIONER SEEKS TO APPEAL DOES NOT INVOLVE A CONTROLLING QUESTION OF LAW AS TO WHICH THERE IS A SUBSTANTIAL GROUND FOR DIFFERENCE OF OPINION, IMMEDIATE APPEAL FROM THE ORDER WILL NOT MATERIALLY ADVANCE THE ULTIMATE TERMINATION OF THIS MATTER, AND THE TRIAL COURT'S REFUSAL TO AMEND WAS NOT EGREGIOUS.

As referenced above, if the trial court denies a request for amendment to include the language of 42 Pa. C. S. section 702(b)[2], the second step to obtaining appellate review is set forth in the Comment to Pa. R.A.P. 1311(d). The comment states that if the trial court "refuses to amend its order to include the prescribed statement [of section 702(b)], a petition for review under Chapter 15 of the unappealable order of denial is the proper mode of determining whether the case is so egregious as to justify prerogative appellate correction of the exercise of discretion by the lower tribunal." Thus, after being denied certification, the litigant's second step would be to petition this Court under chapter fifteen and establish the reason the case is so egregious as to require

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[2] **(b) Interlocutory appeals by permission.--**When a court or other government unit, in making an interlocutory order in a matter in which its final order would be within the jurisdiction of an appellate court, shall be of the opinion that such order involves a controlling question of law as to which there is substantial ground for difference of opinion and that an immediate appeal from the order may materially advance the ultimate termination of the matter, it shall so state in such order. The appellate court may thereupon, in its discretion, permit an appeal to be taken from such interlocutory order.

42 Pa. C. S. § 702 (b).

immediate correction of the trial court's ruling. See *Commonwealth v. McMurren*, 945 A.2d 194, 195-96 (Pa. Super. 2008) (detailing procedure). In *Commonwealth v. Dennis*, 580 Pa. 95, 859 A.2d 1270, 1275 (2004), the Supreme Court explained:

> "where the trial court refuses to certify an interlocutory order [for appeal], the accepted procedure for requesting appellate review of an uncertified, interlocutory order is by the filing of a Petition for Review, directed to the appellate court which would have jurisdiction if a final order were entered in the matter." […] "The purpose of a Petition for Review in such cases is to test the discretion of the trial court in refusing to certify its order for purposes of appeal." […]

(other citation omitted). In *Hoover v. Welsh*, 419 Pa. Super. 102, 615 A.2d 45, 46 (1992), this Court ruled that where the trial court refuses to amend its order so as to characterize it as appealable:

> [A] party filing a petition for review from an order denying certification should incorporate into the petition for review all of the components which are required to be included within a petition for permission to appeal. *See* Pa.R.A.P. 1312. In such a case, the best practice is to prepare a document which conforms in every respect to the requirements of a petition for permission to appeal, but label the document a 'Petition For Review (from the order of the Court of Common Pleas of _____ County refusing to amend its order pursuant to Pa.R.A.P. 1311(b) [sic]'. In presenting the 'statement of reasons,' emphasis should be placed on why the trial court ... erred in failing to amend its order *viz.,* that the underlying interlocutory order the petitioner seeks to appeal involves a 'controlling question of law as to which there is a substantial ground for difference of opinion' and 'immediate appeal from the order may materially advance the ultimate termination of this matter.' The petition also should stress that the refusal to amend was 'egregious.'

(other citation omitted). Instantly, Petitioner has complied with the requirement that he file a Petition for Review.

The Commonwealth respectfully submits that the Order denying Petitioner's discovery request of the TrueAllele source code from which the instant Petition for

Review is taken was proper. Accordingly, there is no basis for this Court to disturb it. This Court will review the trial court's Order denying discovery for an abuse of discretion. "Discretion is abused when the course pursued represents not merely an error of judgment, but where the judgment is manifestly unreasonable or where the law is not applied or where the record shows that the action is a result of partiality, prejudice, bias or ill will." *Commonwealth v. Robinson*, 122 A.3d 367, 373 (Pa. Super. 2015) (other citation omitted). The question whether an order is "final" and thus immediately appealable to the Superior Court is a question of law, concerning which this Court's standard of review is *de novo,* and its scope of review is plenary. *Commonwealth v. White*, 589 Pa. 642, 910 A.2d 846, 652 n. 1 (2006).

A. THE UNDERLYING INTERLOCUTORY ORDER PETITIONER SEEKS TO APPEAL DOES NOT INVOLVE A CONTROLLING QUESTION OF LAW AS TO WHICH THERE IS A SUBSTANTIAL GROUND FOR DIFFERENCE OF OPINION.

Concerning the requirement that there be a "controlling question of law as to which there is a substantial ground for difference of opinion", Petitioner claims that public opinion regarding the legitimacy of hair analysis, arson, and bite mark evidence is relevant to a determination about the validity of completely unrelated DNA identification evidence. Unfortunately for Petitioner, DNA identification evidence is commonly accepted as reliable in the vast majority of courts across the United States, and is generally admissible to assist in determining the identity of criminal offenders. See Thomas M. Fleming, Annotation, *Admissibility of DNA Identification Evidence*, 84 A.L.R.4th 313 at § 4 (1991) (collecting cases from federal district courts in New Hampshire and Vermont, the 6th, 8th, 9th and 10th Circuits, and state courts of Alabama, Alaska, Arizona, Arkansas, California, Colorado, Delaware, the District of Columbia,

Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Rhode island, South Carolina, South Dakota, Tennessee, Texas, Virginia, Washington, West Virginia, and Wyoming (41 states)).

Petitioner next alleges that Judge Jeffrey Manning's ruling in the California *Martell Chubbs* case created a substantial ground for difference of opinion (see Petition for Review ("PR") at pp. 13-15). The Commonwealth respectfully disagrees. In *Chubbs*, the State of California opposed production of the TrueAllele source code. On June 16, 2014, Judge Manning issued an Order directing Dr. Perlin to comply with the defendant Chubbs' subpoena duces tecum requesting the source code. The Opinion states that as the expert who would establish the defendant Chubbs was present at the scene of a murder, Dr. Perlin was a "material witness" in that case. Accordingly, Judge Manning opined:

> The evidence that places the defendant at the scene of a crime is without question "material". The means by which Dr. Perlin arrived at his opinions is likewise material. The argument that Dr. Perlin is not a material witness or that the evidence sought to be produced is not material is specious.

Memorandum Opinion and Order of Court, 6/16/2014 at p. 4 (Exhibit M to Petition for Review).

Defendant uses Judge Manning's statement to argue that Judge Manning and Judge Rangos have differing opinions concerning the Commonwealth's obligation to produce the TrueAllele source code. (PR at 15). This is incorrect, since Judge Manning was merely ordering Dr. Perlin to comply with a subpoena duces tecum issued in

California, by traveling there with documents. Judge Manning's Opinion and Order do not order production of the source code, but instruct, "[w]hat, if anything, is done with that information is a matter to be determined by [the California trial court]." (Exhibit M to Petition for Review at p. 6.) Taken in context, Judge Manning's Opinion and Order did not deem the source code to be material in the sense that it is critical to Chubbs' (or Petitioner's) case. Additionally, the Order requiring production of the source code was reversed by the California Superior Court on January 9, 2015, albeit in an unpublished Opinion, that held Dr. Perlin was not required to produce the source code and that it was not material to the case merely based on bald defense assertions that the source code was required to evaluate the reliability of TrueAllele. (See *People v. Superior Court (Chubbs*) 2015 WL 139069, at *8-9 (Cal. Ct. App. January 9, 2015)).

Additionally, Judge Manning recently disavowed any disagreement that Petitioner alleges exists between Judge Manning and Judge Rangos concerning the Commonwealth's obligation to produce the TrueAllele source code. In the Allegheny County case of *Commonwealth v. Chelsea Lynn Arganda and Chester Cornelius White*, CC numbers 2013017748 and 2013017753, the record reveals the Commonwealth intended to call Dr. Perlin as an expert concerning a complex DNA mixture. Defense counsel, who are also counsel in the present case, issued a subpoena duces tecum for the TrueAllele source code, without which it was claimed the basis for Dr. Perlin's conclusions and methodology could not be evaluated. ADA Catanzarite moved to quash the subpoena. At a Motions Hearing on October 15, 2015 in the *Arganda/White* matter, Judge Manning acknowledged that the same issue had been presented in the instant Michael Robinson case before Judge Rangos.

Rather than uphold a "substantial ground for difference of opinion" concerning production of the TrueAllele source code as the defense now asserts, Judge Manning indicated his commitment to consistency with other Allegheny County jurists who would rule on this issue. Judge Manning stated:

> The bottom line is, it's in front of Judge Rangos, I'm not going to hear it until she's ruled. It's competent jurisdiction of the same jurisdiction as I am. […] What she rules is ultimately going to be controlling because we are judging the same jurisdiction. That's it.

Notes of Testimony, *Arganda/White* Motions Hearing at p. 10 (attached as Exhibit 1). See also Judge Edward J. Borkowski's Order quashing subpoena duces tecum for TrueAllele source code in *Commonwealth v. Allen Wade*, 1/14/2016 (attached as Exhibit 2). In short, any inconsistency that may have existed concerning production of the source code based on an interpretation of the *Chubbs* case has evaporated.

Even outside of Allegheny County, jurists do not have a substantial ground for difference of opinion concerning the Commonwealth's obligation to produce the TrueAllele source code. See e.g., Opinion and Order denying access to Cybergenetics TrueAllele Casework source code in *State v. John Wakefield*, Supreme Court of State of New York for Schenectady County, New York, 3/13/2015 (attached as Exhibit 3) and Opinion and Order denying Motion to Compel TrueAllele source code in *State v. Maurice Shaw*, Court of Common Pleas of Cuyahoga County, Ohio, 10/9/2014 at p. 26 ("the TrueAllele methodology and the Sate's witness are reliable without the use of the source code.") (attached as Exhibit 4). Based on a review of the above decisions examining whether the TrueAllele source code must be produced, there appears not to

be a "substantial ground for difference of opinion" as envisioned in section 702(b) that warrants certification of the court's December 7 order as appealable in this case.

B. IMMEDIATE APPEAL FROM THE UNDERLYING INTERLOCUTORY ORDER WILL NOT MATERIALLY ADVANCE THE ULTIMATE TERMINATION OF THIS MATTER.

Although Petitioner does not address this factor in his Petition for Review, the Commonwealth respectfully submits an immediate appeal would not advance the termination of this case. A determination that the source code is discoverable is merely an initial step in the progress of Petitioner's trial. The parties likely will proceed to select a jury, and the trial court will likely nonetheless hear evidence from the Commonwealth and the Petitioner concerning Petitioner's guilt. Accordingly, an immediate appellate decision on this matter will not save time. As this Court recognizes,

> [t]he purpose of the interlocutory procedure rule to secure immediate appellate review is not designed to encourage or authorize the wholesale appeal of difficult issues when appellate review would be better served by having all issues that are raised in a trial initially reviewed by the trial court and then subject to one review if necessary.

Kensey v. Kensey, 877 A.2d 1284, 1289 (Pa. Super. 2005) (other citation omitted).

Judge Rangos' Order neither ends the litigation nor disposes of the entire case, and for this reason it typically would not be subject to this Honorable Court's review. See *Doughery v. Heller*, 97 A.3d 1257, 1261 (Pa. Super. 2014) ("[g]enerally, discovery orders are deemed interlocutory and not immediately appealable because they do not dispose of the litigation.") (*En banc*) (other citation omitted); *Commonwealth v. Scarborough*, 619 Pa. 353, 64 A.3d 602, 608 (2013) (characterizing a final order as "one which ends the litigation or disposes of the entire case"); *Diamond v. Diamond*, 715 A.2d 1190, 1193 (Pa. Super. 1998) (noting that orders imposing discovery

sanctions are not appealable until entry of final judgment "even where the party refusing to provide discovery is held in civil contempt in an effort to coerce compliance with a discovery order"); contrast *Rhodes v. USAA Cas. Ins. Co*., 21 A.3d 1253, 1258 (Pa. Super. 2011) (discovery orders that *require the disclosure* of privileged or confidential material may be immediately appealable as collateral orders because "the disclosure of documents cannot be undone.") (Emphasis supplied).

Additionally, this Court has recognized that a discovery order encompassing material that is intertwined with the facts necessary to support the action is not separable from the action. *See Van der Laan v. Nazareth Hosp.,* 703 A.2d 540, 541 (Pa. Super. 1997). In *Van der Laan,* this Court explained that "this definition of separability in the discovery context is necessary to prevent our appellate courts from becoming 'second-stage motion courts' and to forestall the interruption and delay of litigation by 'piecemeal review of trial court decisions.'" *Id*. at 542 (citations omitted). Presently, the TrueAllele source code provides a basis for the opinion of the Commonwealth's expert in this matter. This testimony will be included as part of the Commonwealth's burden of proof of beyond a reasonable doubt at trial, and thus it cannot be deemed separately appealable. Additionally, if the instant Petition for Review were granted, the likely outcome would be an appeal of that decision, thus further delaying trial. On the whole, an immediate appeal would not advance the termination of this case. The Commonwealth respectfully submits that the discovery process should be permitted to develop and conclude without this Court's intervention.

C. THE TRIAL COURT'S REFUSAL TO AMEND WAS NOT EGREGIOUS.

Petitioner argues the trial court's order denying certification is egregiously

erroneous in several respects. Among those assignations of error, Petitioner claims the Commonwealth provided little support for the assertion that disclosure of the source code would harm Dr. Perlin's business. (PR at p. 13). Contrary to Petitioner's claim, the record contains support for the assertion that disclosure of the source code will harm Dr. Perlin's business. See Declaration of Mark W. Perlin, April 2015, at pp. 6 – 7, para. 47-60 (emphasis supplied):

> 47. People can easily copy a computer program if they have its source code.
> 48. Source code contains the software design, engineering know-how, and algorithmic implementation of the entire computer program.
> 49. Cybergenetics has invested millions of dollars over two decades to develop its TrueAllele system, the company's flagship product. Although the technology is patented, the source code itself is not disclosed by any patent and cannot be derived from any publicly disclosed source.
> 50. Cybergenetics considers the TrueAllele source code to be a trade secret. Cybergenetics does not disclose the source code to anyone outside the company. In fact, the source code has never been disclosed. The source code is not distributed to employees of Cybergenetics, and copies are not provided to individuals, businesses or government agencies that use or license the software.
> 51. The fact that the source code is kept secret provides Cybergenetics with a significant advantage over others who do not have access to the source code and do not have the programming know-how or are not willing to make the investment necessary to develop comparable software.
> 52. Cybergenetics operates in a highly competitive commercial environment.
> 53. In recent years, at least five other groups have developed similar software.
> 54. **There is keen interest from competitors to find out how to replicate TrueAllele. The TrueAllele software represents a technological breakthrough that has not been successfully replicated by any other company as of this date**.
> **55. Disclosure of the TrueAllele source code trade secret would cause irreparable harm to the company,**

> **enabling competitors to easily copy the company's proprietary products and services**.
> **56. Ownership of the TrueAllele program and source code provides Cybergenetics with an advantage over its competitors who do not know the proprietary code and could not legally duplicate it.**
> **57. Cybergenetics takes reasonable measures to protect the secrecy of the source code. For example, all information relating to the source code is housed on secure computers**.
> **58. TrueAllele's source code derives value from remaining secret, and has never been disclosed to the public.**
> 59. In contrast to so-called "open source" programs, for-profit companies do not make their source codes available to the public.
> 60. Commercial software programs are extensively validated while in development and before release and commercialization. By their nature, open source programs typically are not validated prior to release, because the process of perfecting software is costly. Open source forensic DNA analysis software programs tend to be relatively short programs consisting of several hundreds of lines of code that realistically can be reviewed by a human being.

(Emphasis supplied). Dr. Perlin's Declaration was filed as Exhibit 1 to the Commonwealth's Supplemental Answer to Motion for Discovery, filed April 14, 2015. It was also admitted at the October 15, 2015 Pre-trial Motions Hearing by defense counsel as Exhibit G (DHTI at p. 57 ("it is part of the record. But there is a copy and it is marked as G, and I would like to offer it at this time.'))

The Statements in paragraphs 47 through 60 of Dr. Perlin's Declaration, set forth fully above, make clear that great harm would be occasioned by having to produce the source code. These statements, which are a part of the record, were not challenged during the defense examination of Dr. Perlin. Finally, during his direct examination by the Commonwealth, Dr. Perlin was asked:

> Could you give us an idea of the economic harm that would befall you if your source code fell in to the hands of a competitor?
>
> A: It could potentially eliminate Cybergenetics as a business.

(DHTII at 49). What is more, defense counsel explicitly acknowledged Dr. Perlin had previously asserted this fact. (*Id*. at pp. 18-19). Further, Defendant's patent law expert, John W. McIlvaine, Esquire, acknowledged on direct examination that he had read Dr. Perlin's Declaration concerning the harmful effects of disclosing the source code trade secret (*Id*. at 20), and Attorney McIlvaine was questioned specifically about certain statements in Dr. Perlin's Declaration. (*Id*. at 20, 35, 40).

Clearly, contrary to averments in the Petition for Review that the Commonwealth failed to produce it, the Commonwealth did proffer evidence concerning the severe damaging effect that disclosure of the source code would have on Dr. Perlin's business, and Petitioner failed to establish the necessity for revelation of the source code. As this Court recognizes, more than a bald assertion of usefulness is required to mandate that a trade secret be revealed. See *Crum v. Bridgestone/Firestone N. Am. Tire, LLC*, 907 A.2d 578, 588 (Pa. Super. 2006) (insufficient to claim that trade secret might be useful; record confirmed petitioner did not offer evidence to establish necessity for disclosure that outweighed harm to trade secret holder and trade secret holder presented evidence formulas sought were not relevant or necessary to the adjudication of claims at issue; trial court orders directing production of evidence reversed). The Commonwealth respectfully submits this Court should reject the assertion that the Commonwealth failed to provide sufficient evidence of the dire consequences of disclosure of the TrueAllele source code, and that the trial court erred in relying upon that evidence

Petitioner also claims he is entitled to reversal of the trial court's Order denying certification because the source code is required to protect his right to confrontation under *Brady v. Maryland,* 373 U.S. 83 (1963) (See PR at 15.)

To be material under *Brady*, as the United States Supreme Court has instructed, "there [must be] a reasonable probability that, had the evidence been disclosed to the defense, the result of the proceeding would have been different. A 'reasonable probability' is a probability sufficient to undermine confidence in the outcome." *Pennsylvania v. Ritchie*, 480 U.S. 39, 57 (1987). In *Commonwealth v. Tharp*, 627 Pa. 673, 101 A.3d 736 (2014), the Pennsylvania Supreme Court held that in order to establish a *Brady* violation, a defendant must demonstrate that withheld impeachment evidence is "determinative of the defendant's guilt or innocence." *Tharp*, 101 A.3d at 747 (other citation omitted). The *Tharp* Court further instructed:

> [F]avorable evidence is material and constitutional error results from its suppression by the government, **if there is a reasonable probability that, had the evidence been disclosed to the defense, the result of the proceeding would have been different**. […] In determining if a reasonable probability of a different outcome has been demonstrated, "[t]he question is not whether the defendant would more likely than not have received a different verdict with the evidence, but whether in its absence he received a fair trial, understood as a trial resulting in a verdict worthy of confidence."

Tharp, *supra*, 101 A.3d at 748 (internal citation omitted; emphasis supplied).

"The rationale underlying *Brady* is not to supply a defendant with all the evidence in the Government's possession which might conceivably assist the preparation of [his] defense, but to assure that the defendant will not be denied access to exculpatory evidence **only** known to the Government." *Commonwealth v. Lambert*, 765 A.2d 306,

325 (Pa. Super. 2000) (emphasis in original). Moreover, *Brady* does not mandate that the prosecution disclose to a defendant all of the evidence in its possession, but only favorable evidence that, if suppressed, would deprive the defendant of a fair trial. *Commonwealth v. Cam Ly*, 602 Pa. 268, 980 A.2d 61 (2009). In *Lambert*, the Supreme Court held that *Brady* does not grant a criminal defendant unfettered access to the Commonwealth's files. *Commonwealth v. Lambert*, 584 Pa. 461, 884 A.2d 848 (2005). "*Brady* does not require the disclosure of information 'that is not exculpatory but might merely form the groundwork for possible arguments or defenses,' nor does *Brady* require the prosecution to disclose 'every fruitless lead' considered during a criminal investigation. […] The duty to disclose is limited to information in the possession of the government bringing the prosecution[.]" *Commonwealth v. Roney*, 622 Pa. 1, 79 A.3d 595, 608 (2013).

As the above controlling case law makes clear, in order to obtain relief under *Brady*, the evidence sought must be outcome determinative, and not merely helpful. The Commonwealth submits Petitioner has failed to establish the source code at issue in this case is either helpful or outcome determinative. And, as Petitioner is aware, the TrueAllele source code he seeks to obtain through discovery is not in the Commonwealth's possession. Therefore, no relief is due on Petitioner's *Brady* claim based on the source code. The failure to produce the source code was not in violation of *Brady v. Maryland*.

Further, to the extent the Petition for Review alleges TrueAllele's reliability cannot be evaluated without its source code, thus mandating reversal of Judge Rangos' Order denying discovery, this Honorable Court has suggested otherwise. In *Commonwealth*

v. Foley, 38 A.3d 882 (Pa. Super. 2012) (*en banc*), the Superior Court addressed whether Dr. Perlin's testimony based on TrueAllele testing in a homicide case was admissible pursuant to *Frye v. United States,* 293 F. 1013 (D.C. Cir. 1923). As the *Foley* Court noted:

> The *Frye* test is a two-step process. […] First, the party opposing the evidence must show that the scientific evidence is "novel" by demonstrating "that there is a legitimate dispute regarding the reliability of the expert's conclusions." [I]f the moving party has identified novel scientific evidence, then the proponent of the scientific evidence must show that "the expert's methodology has general acceptance in the relevant scientific community" despite the legitimate dispute.

Foley, 38 A.3d at 888 (internal quotation marks omitted). The Foley trial court did find that Dr. Perlin's methodology was generally accepted. However, the trial court had not determined whether Dr. Perlin's testimony was "novel scientific evidence". The *Foley* Court nevertheless pointed out the trial court had "[found] Dr. Perlin's methodology [to be] a refined application of the "product rule," a method for calculating probabilities that is used in forensic DNA analysis." *Id*. The *Foley* Court noted the Pennsylvania Supreme Court found scientific evidence based on the product rule to be admissible. *Id*., citing *Commonwealth v. Blasioli,* 552 Pa. 149, 713 A.2d 1117, 1118 (1998).

Petitioner claims the trial court's citation to *Foley* in its Opinion and Order dated February 4, 2016 is "outrageous" and demonstrates the court's misunderstanding of the issue raised concerning the TrueAllele source code (PR at 9). More specifically, Petitioner claims the trial court egregiously determined that he "alleges that TrueAllele's reliability cannot be evaluated without the source code", and that what Petitioner actually requested was protection of his constitutional right to confront and cross-

examine the Commonwealth expert. *Id*. However, the record reveals that the trial court had good reason for referencing *Foley*, and the court did not discount Petitioner's constitutional claim.

The trial court was merely responding to Petitioner's arguments, which, as set forth in the Petition for Review, include entwined arguments that the reliability of TrueAllele cannot be tested without the source code, and that the source code is necessary for the exercise of Petitioner's right to confrontation. For example, Petitioner argues he "**cannot cross-examine a computer."** (PR at 4 (emphasis in original)). Moreover, at the second pretrial hearing held on this matter, counsel for Petitioner explicitly addressed technical, scientific aspects of the TrueAllele program in the cross-examination of Dr. Perlin. (DHTII at 127 – 134.) At that point, Judge Rangos stated:

> We may be getting beyond the source code issue here.

Id. at 134. Defense counsel responded:

> I think that's why we need a source code. This is incredibly complex. Nobody could possibly understand it. We could get the source code, and he could review it.

Id. at 134-135. The following exchange occurred:

> THE COURT: I believe the source code issue is separate from the underlying *Frye* issue. The source code issue has to do with whether or not the TrueAllele software can be validated by scientific method rather than by access to the source code itself or the TrueAllele software.
>
> DEFENSE COUNSEL: But the program has changed continuously and constantly over time. So every time a case comes up, if the Commonwealth wants to say *Foley*, *Foley, Foley* –
>
> THE COURT: […]What I'm trying to ask you is, are we not getting more into the DNA match that underlies the *Foley/Frye* test than we are whether or not the source code is necessary to validate it?

> DEFENSE COUNSEL: It's not to validate. It's to determine how reliable is this. […]
>
> THE COURT: […] I'm not clear I understand why we need to go into this whole loci information at this point.

Id. at 134 – 136. Defense counsel then terminated this line of questioning. Subsequently, during closing argument, defense counsel stated:

> [T]here are really two different needs for the source code. One is to determine the admissibility of the testimony. That would be the *Frye* issue.
>
> And the second one is a kind of pure Sixth Amendment issue. And as I indicated before, the *Frye* issue goes to the scientific validity, to use the Court's phrase. Which is, is this a valid science? Should we even allow a fact finder, a jury, to even listen to this? Because as we know from recent events, jurors –
>
> First of all, the studies have been done, jurors just focus in on expert testimony like this, and pretty much just adopt it carte blanche unless there is an ability to find that smoking gun […].
>
> So it's generally accepted. Many people were convicted based on science that that that time seemed reliable and have since been debunked. And that's one of the thigs we submitted to the court.
>
> Whether it be arson testimony in the '70s and '80s, totally debunked now.
>
> Whether it be hair analysis that was deemed to be reliable, there were some statistical probabilities attached to it, almost completely debunked now.
>
> And DNA probability statistical analysis that the FBI used for years, which they have now admitted that they overstated match statistics, and they have apologized and admitted error.
>
> So the first issue is, is this necessary for us to even present a *Frye* challenge so that the Court can determine should we even allow the jury to hear this? And I submit to you that because jurors attach such great importance to this type of evidence that there should be a full *Frye* hearing in

this case.

> Whether other lawyers in other cases in other jurisdictions or anywhere outside this courtroom fought, presented witnesses, put a presentation forth, that's of no moment really of this Court. I mean, this Court has to decide this based on the record that has been created before it. And I know Your Honor knows that.
>
> But just saying, for instance, the *Wakefield* case, there was no record created in that case for the source code. It was solely a *Frye* issue. And just saying that -- Did they ask for the source code? Yes. Well, if you ask for something but you don't explain why you need it or make argument that has legal meaning and sense, well, of course you're not going to get it. And in this case, Your Honor, the evidence, I submit, couldn't be clearer that certainly on the second issue --
>
> And I don't concede the first at all. I think as to the scientific validity, the source code is necessary. Dr. Chakraborty said so.
>
> On the second issue of Sixth Amendment right to confront witnesses against you at trial, how could the defendant not be entitled to the source code and everything about TrueAllele so that we can test the reliability?
>
> They want us -- they want the jury to make their determination as to the reliability of TrueAllele based on out-of-court experiments that they're calling peer-review validation studies. That only goes to whether it's admissible. We don't have to be stuck with the blanket statements that haven't been supported at all in this courtroom by Dr. Perlin that, "Don't worry, it's been validated." And he puts in this declaration that it's validated and reliable.
>
> Reliable is not up to him. Reliable is not up to the people who did the studies with him[.]

Id. at 154 – 157. Clearly, during discovery, Petitioner placed the *Foley* decision at issue, and the trial court cannot be faulted for addressing Petitioner's claim.

In *Foley*, this Court upheld the admissibility of TrueAllele despite the nondisclosure of the source code. The *en banc Foley* Court held, in response to the

claim that the reliability of TrueAllele cannot be tested without the source code, that "scientists can validate the reliability of a computerized process even if the 'source code' underlying that process is not available to the public. TrueAllele is proprietary software; it would not be possible to market TrueAllele if it were available for free." *Foley*, *supra*, 38 A.3d at 889 (emphasis supplied). Although the *Foley* holding could be deemed *dicta*, having been decided on *Frye* grounds, it is still instructive and persuasive for the Commonwealth's position that the source code is not necessary for evaluating the reliability of TrueAllele.

Similarly, a trial court in New York has rejected the idea that the source code is necessary to understand TrueAllele or to determine its reliability. See *People v. Wakefield*, 47 Misc. 3d 850, 854-855 9 N.Y.S.3d 540 (Sup. 2015); see also *People v. Belle,* 47 Misc.3d 1218(A), 2015 WL 2131497 (Sup. Ct. Bronx Co. April 29, 2015) [involving another program, and concluding that its source code was irrelevant].) Additionally, TrueAllele is not the only DNA analysis tool that contains proprietary information. GeneScan and GenoTyper from Applied Biosystems contain proprietary information. See *State v. Foreman*, 288 Conn. 684, 726, 954 A.2d 135, 162 (2008). Profiler Plus and Cofiler kits manufactured by Perkins-Elmer also contain proprietary primers that are not publicly available. See *People v. Hill*, 89 Cal. App. 4th 48, 107 Cal. Rptr. 2d 110 (2001); *State v. Traylor*, 656 N.W.2d 885 (Minn. 2003). There is no indication that proprietary information makes these genotyping tools untrustworthy or inadmissible in criminal cases. The Commonwealth submits these rulings are sound and provide valid guidance in this matter concerning the issue whether the reliability and accuracy of TrueAllele can be tested without its source code.

Separate from litigation concerning probabilistic genotyping software, there has been extensive litigation in other states regarding disclosure of source codes for DUI breath-testing equipment. Generally, courts have determined that disclosure is not necessary in order to test the machines' accuracy. Several courts have denied requests for the breath test source code simply because it was not in the state's possession. See *State v. Tindell*, 2010 WL 2516875, at *16 (Tenn. Crim. App. June 22, 2010) ("We see no error in the trial court's conclusion that the source code was not discoverable under this Rule. First, Appellant has failed to demonstrate that the State had possession, custody, or control over the source code."); *State v. Bernini*, 220 Ariz. 536, 207 P.3d 789, 791 (Ct. App. 2009) ("Reasonable evidence supported the respondent judge's findings that the state has no independent obligation […] to produce CMI's source code for the Intoxilyzer 8000, because, based upon the record […], the state has neither possession of the source code nor control over CMI."); *People v. Robinson,* 860 N.Y.S.2d 159, 167, 53 A.D.3d 63, 73-74 (2008) ("the People were not required to make available the Intoxilyzer's source code because the People never possessed it, actually or constructively. […] The Intoxilyzer source code was not the property of the State, since it was owned and copyrighted by its manufacturer, CMI, Inc., a Kentucky corporation, and is a trade secret of CMI, Inc. (citing *Moe v. State,* 944 So.2d 1096 (Fla. Dist. Ct. App. 2006); *People v. Cialino,* 14 Misc.3d 999, 831 N.Y.S.2d 680, 681-682 (N.Y.Crim.Ct.2007) [it was "undisputed" that the People did not actually or constructively possess the source code])"); *City of Fargo v. Levine*, 747 N.W.2d 130, 134 (N.D. 2008) (same).

In a case where a court has ordered disclosure of breath test source code, the

facts are markedly different from those in Petitioner's case. See *In re Comm'r of Pub. Safety* 735 N.W.2d 706, 712 (Minn. 2007) *("Underdahl I").* In *Underdahl I*, the Supreme Court of Minnesota found that state had possession or control of the source code because the Commissioner of Public Safety had an agreement with the breath test machine's manufacturer that gave the Commissioner access to the source code. This ruling was upheld in *State v. Underdahl,* 767 N.W.2d 677 (Minn. 2009) *("Underdahl II").* However, in *Underdahl II*, the court reversed the order mandating disclosure as to one of the defendants because he had made no specific showing of relevance. *Id*. at 685.

On *Brady*/Sixth Amendment grounds, other jurisdictions have rejected requests for source code. *Tindell*, *supra,* 2010 WL 2516875, at *14 (noting that Confrontation Clause guarantees the right to confront those who bear testimony against a defendant, and concluding that breath testing machine was not a witness pursuant to the Confrontation Clause.); *State v. Marino*, 229 N.C. App. 130, 137, 747 S.E.2d 633, 638 (2013) (rejecting *Brady* argument that defendant entitled to source code; "defendant failed to establish Intoximeter source code was 'favorable' to his case or 'material either to guilt or to punishment.' Instead, defendant [sought] to examine the source code in hopes that it will be exculpatory in nature or will lead to exculpatory material.").

Other jurisdictions have required a showing of materiality, which requires some suggestion that an error exists in the code before ordering its disclosure. See *Commonwealth v. House*, 295 S.W.3d 825, 829 (Ky. 2009) ("in this case, the party demanding production can point to nothing more than hope or conjecture that the subpoenaed material will provide admissible evidence. House, as noted above, sought CMI's Intoxilyzer code hoping that his expert might discover flaws in it, but he presented

no evidence whatsoever suggesting that the code was flawed. His subpoena was nothing but a classic fishing expedition, which RCr 7.02(3) does not allow."); *Bernini*, *supra*, 218 P.3d at 1069 (vacating order mandating disclosure of code "merely in hope that something will turn up").

The cases summarized above make clear that it is common for cases to proceed without the parties having access to proprietary source code. All that is required is access to the program's methodology, and validation studies verifying its results. Petitioner has access to those factors in the case at bar. Consistent with the authority cited above, the trial court correctly denied the Motion for Discovery for the TrueAllele source code in this case, and this was not an abuse of discretion. As to the Petitioner's outrageous and unsubstantiated claim that the court's ruling is evidence of actual bias (PR at 12, 18), the Commonwealth respectfully submits that the court's application of controlling case law cannot be deemed favoritism.[3]

Based on all of the above authority and analysis, the Commonwealth respectfully submits that if this Court elects to address the claims presented in the instant Petition for Review, the Order denying Petitioner's Application for Amendment to Include Certification of the Interlocutory Discovery Order Issued on December 7, 2015 should be upheld.

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[3] Moreover, if a party questions the impartiality of a judge, the proper recourse is a motion for recusal, requesting that the judge make an independent, self-analysis of the ability to be impartial. *Commonwealth v. Druce*, 577 Pa. 581, 848 A.2d 104, 108 (2004) (other citation omitted).

CONCLUSION

WHEREFORE, the Commonwealth respectfully requests that the trial court's Order denying Petitioner's Application for Amendment to Include Certification of the Interlocutory Discovery Order Issued on December 7, 2015 should be affirmed.

Respectfully submitted,

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IN THE COURT OF COMMON PLEAS OF ALLEGHENY COUNTY,

PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA

vs.

CHELSEA LYNN ARGANDA,
CHESTER CORNELIUS WHITE, JR.

Defendants.

CRIMINAL DIVISION

CC No: 2013017748/2013017753

PROCEEDINGS:
Motions Hearing

REPORTED BY:
Mary Anne Salsgiver
Official Court Reporter

DATE:
October 20, 2015

BEFORE:
Hon. Jeffrey Manning

APPEARANCES

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- - -

EXHIBIT 1

- - -

P R O C E E D I N G S

- - -

October 20, 2015

- - -

THE CLERK: Now is the time and date set for the case of the Commonwealth of Pennsylvania versus Chelsea Arganda and the Commonwealth of Pennsylvania versus Chester White.

MR. CATANZARITE: Your Honor, Brian Catanzarite for the Commonwealth.

MR. HABER: Your Honor Kenneth Haber for Chester White.

Relative to the Cybergenetics and request for the source code information relative to that program, the Commonwealth has filed a motion to quash the subpoena on the basis that -- you heard, the answer is yes and no. You heard this in a different case in June of 2014, Your Honor. The case was a California case, the State of California v Martell Chubbs, a subpoena was issued for the same information in that case. Your Honor issued a six-to-seven opinion, a copy of which we can certainly

provide.

THE COURT: And I denied it.

MR. HABER: No, in that case the Court ruled that --

MR. GEARY: If I may, Judge, can I supplement Mr. Haber?

Judge, you ruled and your opinion order in the Martell Chubbs matter in the State of California on Page 3 that the evidence that is thought to be produced is material. And then at Page 5 you ruled it is apparent that this evidence is sought to allow the defendant in that case to effectively cross examine Dr. Perlin. And then at Page 6 Dr. Perlin and his legal counsel tried to evoke the Foley case was somehow an obstacle to Mr. Chubbs attorney obtaining a source code. You ruled on Page 6 of your opinion the issue before that court was the admissibility of the testimony not its credibility.

Nothing in Foley would prevent cross examination of an expert based upon the source code or pseudo source code even in the Commonwealth of Pennsylvania. You further ruled that nothing under the subpoena requires

the disclosure of trade secrets. And the final statement, the commercial value of that information is something that can be readily be protected by Judge Romero with a protective order. So in this case --

THE COURT: -- so why are you here?

MR. GEARY: Why we're here is because the Commonwealth has objected to our subpoena. We were provided by Dr. Perlin, through the Commonwealth, a report that's three pages that contains no information that helps us identify what methodology he employed to arrive at his conclusion. A second document called a case packet. We went through the case packet. Nothing in the case packet identifies for us what the information that was used by Dr. Perlin. Dr. Perlin has a computer program, a software program that and it contains 170,000 lines of source code. Source code are the instructions that Dr. Perlin types into in his source code and goes into the computer and he tells the computer what to do with the data from the crime lab. We're entitled to know what he tells the computer to do with the data. Within that source code is the basis for his

conclusion and his methodology. For instance, Dr. Perlin --

THE COURT: -- I don't want to hear this whole thing right now. What is your position?

MR. CATANZARITE: Your Honor, the Commonwealth is objecting to their subpoena based on the Commonwealth v Cooke which states that subpoenas are not to be used to compel production of documents merely for inspection or for a fishing expedition. The defense has failed to raise or even offer, any offer of proof.

THE COURT: Why is this before me?

MR. CATANZARITE: The case is before this Court, Chester White and Chelsea Arganda are both before this Court. This motion to quash the subpoenas is in response to their subpoena duces tecum served on Dr. Perlin who is the Commonwealth's expert in those cases.

MR. HABER: The initial review of the evidence by the Allegheny County Crime Lab they concluded that there was a complex mixture of four or more people that contributed to the --

THE COURT: -- when is this case scheduled for trial?

MR. CATANZARITE: November 3rd, I believe Your Honor.

If I may. The issue that ultimately both parties are getting at is whether or not Dr. Perlin's source code is material and whether or not turning it over is reasonable and in the interest of justice pursuant to Rule 573. There is a similar issue between the Commonwealth, Mr. Haber and Mr. Geary on another matter, Commonwealth v Robinson in front of Judge Rangos. Right now we're in the middle of a hearing on whether or not the source code is material. That hearing is set to continue on --

THE COURT: -- is it before Judge Rangos right now?

MR. CATANZARITE: That's correct, Your Honor.

MR. HABER: On a different case.

THE COURT: It doesn't matter. And in Judge Rangos case it references the same issue related to Dr. Perlin's source code; does it not? It's based on the same law of hers that I use, she's a judge of equal jurisdiction.

MR. HABER: Judge, in that case, Judge

Rangos chose to address it and in that case the subpoena was also served on Dr. Perlin and there was a motion to quash but Judge Rangos has not ruled on the motion to quash and has chosen to address it in a separate hearing as a discovery issue. Clearly the Commonwealth is not in possession of this material, we know that. We subpoenaed it and this Court -- I don't think whether it's a discovery issue or a subpoena issue, I think it goes without saying that this is very material and Your Honor ruled that it was. I couldn't agree more that it's very material. It's not a fishing expedition that's for sure. And it's not only material as Dr. Perlin is a witness but it's the source code material and his ultimate findings, as this Court pointed out in the State of California case versus Martell Chubbs, to competently and effectively represent the defendant in this case or any case where this is an issue, this material is not only relevant but necessary.

MR. CATANZARITE: Your Honor, that is not what this Court has previously found. When this Court participated in the California v

Martell Chubbs, the issue before the Court then was whether Dr. Perlin had to travel to California as a material witness. This Court relied on the findings and certification of Judge Romero in finding that Dr. Perlin was a material witness and his evidence was material to the case. However, this Court in its actual ruling said what if anything is done with that information is a matter to be determined by Judge Romero. This Court declined to rule specifically that the source code is material. And it discusses it in dicta but the ultimate ruling is that's up in the judge in California and Dr. Perlin has to travel physically to California with that information. The ultimate determination by California, by the appeals court in California, was that Dr. Perlin did not have to turn over the source code, that it was not material to the case. That Dr. Perlin's TrueAllele Program could be validated without turning over the source code, that was the ultimate finding in that Chubbs case.

But just coming in here and saying that the source code is material, does not meet their burden of showing that it is material

under the law. There has to be some evidentiary showing which again we're in the middle of in Judge Rangos courtroom.

MR. HABER: Judge, two things if I might. Number One, this Court did rule that, and again I think very appropriately ruled that the evidence sought to be produced, the source code or source codes, is material and you stated I think rather eloquently that through the argument that Dr. Perlin is not a material witness and or the evidence thought to be produced is not material is an specious argument, so that's contrary to what the Commonwealth is now stating this Court rule.

Number Two, the California trial judge did order the material to be produced.

THE COURT: Then it's wrong.

MR. HABER: No, the appellate court remanded --

THE COURT: -- it's determined to be wrong.

MR. HABER: No, no. My understanding is the appellate court remanned it for an evidentiary hearing to determine that.

THE COURT: I don't really care. The

bottom line is, it's in front of Judge Rangos, I'm not going to hear it until she's ruled. It's competent jurisdiction of the same jurisdiction as I am. If you're in there, you'll have to finish up there.

MR. CATANZARITE: Thank you, Your Honor.

THE COURT: What she rules is ultimately going to be controlling because we are judging the same jurisdiction. That's it.

I'm not going to jump start Judge Rangos ruling, I don't know what she's going to rule.

MR. HABER: I guess our position would be the litigants in this case, Judge, are not in front of Judge Rangos.

THE COURT: It doesn't matter, Mr. Haber. The law of the case, the whole concept, one judge rules the same jurisdiction which affects all the other judges. She's up and running and you're over there. Go back over there and finish up and then we'll see where we are.

MR. HABER: Judge, with that, Your Honor's opinion is binding in the courthouse.

THE COURT: I suppose you can make that argument to her, okay.

MR. CATANZARITE: Right.

MR. GEARY: Just so the Court is aware, the trial date for this --

THE CLERK: -- November 3rd.

THE COURT: That's not going to go.

MR. GEARY: It will have to be pushed back. Thank you.

- - -

(Whereupon, Court was adjourned.)

- - -

MARY ANNE SALSGIVER
OFFICIAL COURT REPORTER

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF ALLEGHENY)

CERTIFICATE OF REPORTER

I, Mary Anne Salsgiver, do hereby certify that the evidence and proceedings are contained fully and accurately in the machine shorthand notes taken by me at the hearing of the within cause, and that the same were transcribed under my supervision and direction, to the best of my ability, and that this is a correct transcript of the same.

Mary Anne Salsgiver
Official Court Reporter

The forgoing record of the proceedings upon the hearing of the above cause is hereby approved and directed to be filed.

Judge

IN THE COURT OF COMMON PLEAS OF ALLEGHENY COUNTY, PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA CRIMINAL DIVISION

VS. CC201404799

ALLEN WADE

COPY

ORDER OF COURT

AND NOW, to-wit, this 14 day of JANUARY, 2016, it is hereby ORDERED, ADJUDGED, and DECREED that the subpoena referred to in paragraph 3 of the within motion be and is hereby QUASHED.

BY THE COURT:

Edward J. Borkowski, J.

Exhibit 2

At a Term of the Supreme Court of the State of New York held for the County of Schenectady, New York at the City of Schenectady, New York on the 30th day of January, 2015

PRESENT: HON. MICHAEL V. COCCOMA
SUPREME COURT JUSTICE

STATE OF NEW YORK
SUPREME COURT: COUNTY OF SCHENECTADY

THE PEOPLE OF THE STATE OF NEW YORK

-against-

JOHN WAKEFIELD

Defendant

DECISION AND ORDER

Indictment No. A-812-29

The Defendant John Wakefield is charged with Murder in the First Degree (PL § 125.27(1)), Murder in the Second Degree (PL § 125.25(1)(a)(vii)), Murder in the Second Degree (PL § 125.25(3)), Robbery in the First Degree (PL § 160.15(1)), and Robbery in the First Degree (PL §160.15(3)).

The People seek to introduce at trial scientific evidence of deoxyribonucleic acid (DNA) using a probabilistic genotype analysis. The Defendant does not argue that the principles and procedures applied to the evidence in this case to derive the DNA data prior to entry into the Cybergenetics TrueAllele Casework software are novel nor does the Defendant argue that the use of statistical models and likelihood ratios in reporting the probative value of DNA evidence is novel. Instead, the Defendant asks the Court to suppress that evidence as being novel in that it

abandons the human element in analysis and it analyzes data that falls below the thresholds incorporated in standard practice by DNA laboratories.

Peter H. Willis, Esq., appeared on behalf of the People; the Defendant appeared in person and by Frederick Rench, Esq. and Catherine Bonventre, Esq. A hearing was held over numerous days at which the Court had a full opportunity to consider the evidence presented in this proceeding, including the testimony offered and the Exhibits received (see attached Table A). The Court further had the opportunity to observe the demeanor of the witnesses - Dr. Mark W. Perlin, Dr. Barry W. Duceman and Jay Caponera - and has made determinations on issues of credibility with respect to these witnesses and the weight to give to their respective testimony. The Court has also considered the arguments of counsel and the points of law referenced in their respective Memorandums.

Since Cybergenetics TrueAllele Casework has never been accepted in a New York Court, it is by nature novel scientific evidence. To be admissible in New York Courts, it must pass the Frye test as first formulated in Frye v United States, 293 F. 1013 (1923) and subsequently adopted by the New York Court of Appeals in People v Middleton, 54 NY2d 42 (1981). That protocol requires that expert testimony be based on a scientific principle or proceeding which has been "sufficiently established to have gained general acceptance in the particular field in which it belongs" (Frye, at 1014). A Frye inquiry is concerned with the basis of an expert's opinion and not whether the particular opinion is sound (Lugo v New York City Health & Hosps. Corp., 89 AD3d 42 [2nd Dept 2011]). In other words, Frye is not concerned with the reliability of an expert's conclusions, but instead with whether the expert's deductions are based on principles that have gained general acceptance as reliable (see Nonnon v City of

New York, 32 AD3d 91 [1st Dept 2006]). And in deciding the admissibility of novel scientific evidence, a court may consider "opinions, texts, laboratory standards or scholarly articles" as well as expert testimony (see People v Wesley, 83 NY2d 417 [1994]).

DNA identification is a powerful forensic tool for solving and preventing crime. Two common sources of data ambiguity in biological evidence are DNA mixtures from multiple contributors and low-template (evidence samples below the threshold) DNA. Although some American laboratories are moving to quantitative modeling of DNA mixture data, most still use Combined Probability of Inclusion (CPI) or Combined Likelihood Ratio (CLR), using the qualitative Boolean logic of all-or-none allele (the number of repeated words) events. Both approaches apply thresholds to the DNA data that cut off quantitative information. Their analysts subjectively apply these analytical or stochastic thresholds manually to data peaks to decide whether or not they believe the evidence peak represents an allele in the genetic material. But the more complex data that has mixtures or low-template DNA limits the applicability of such qualitative procedures.

Computer interpretation methods use more of the quantitative short tandem repeat (STR) peak height data rather than thresholds and have been used for over 20 years. Computers offer three principal advantages in the interpretation process: (1) productively - eliminates the often time-consuming human review of cases that are impossible to solve, (2) information - human review typically makes simplifying assumptions that can discard considerable identification information containing DNA evidence whereas a computer can use a statistical model to fully examine the quantitative peak height data, and (3) objectivity - human mixture interpretation methods sometimes use the suspect genotype (pair of allele) to help infer or report

results whereas a mathematically programmed computer can infer a genotype directly from the evidence data without using any suspect information and then afterward compute a match likelihood ratio (LR) statistic from this genotype.

Probabilistic genotypes have been recognized by regulatory bodies such as the Scientific Working Group on DNA Analysis Methods (SWGDAM)[1] in its 2010 "Interpretation guidelines for autosomal STR typing by forensic DNA testing laboratories" and the American National Standards Institute (ANSI) in the 2011 article "Data format for the interchange of fingerprint, facial & other biometric information" as a valid approach to DNA Interpretation and reporting. There are two probabilistic approaches:

(1) semi-continuous[2] - information is determined from the allele present - peak heights are not considered, and

(2) fully continuous[3] - incorporation of biological parameters.

Cybergenetics TrueAllele Casework is a fully continuous probabilistic approach that analyzes the electropherograms (EPG) (computerized DNA data that a local laboratory extracted and amplified) and considers the genotypes (pair of alleles) at every locus (pair of DNA sentences) of each contributor, taking into consideration the mixture weights of the contributors, the DNA template mass, polymerase chain reaction (PCR) stutter, relative amplification, DNA degradation, and the uncertainties of all these variables. Its genetic calculator uses Markov chain

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[1]A forensic DNA advisory group to the FBI director that is comprised of forensic scientists who serve as DNA technical leaders or CODIS administrators in their laboratories.

[2]e.g. LRmix, Like LTD, FST, Lab Retriever, Armed Expert, Geno Proof Mixture.

[3]e.g. TrueAllele Casework, STRmix, DNA-View Mixture Solution, DNAmixtures

Monte Carlo (MCMC)[4] to give the probabilities of all the different possibilities, not just a maximum possibility, and by using Bayes theorem[5], it decomposes that calculation into a prior probability and a likelihood function that compares genotypes relative to a population and computes a match LR.

The Defendant's expert, and others, question this approach. They argue that there is a lack of validation software, it is costly and time consuming, and it uses "black box" technology. The acknowledged success of Cybergenetics TrueAllele Casework has begun to erode these barriers and there is a move in the direction of probabilistic modeling, but the use thereof would still represent a minority of casework. However, the test is not whether a particular procedure is unanimously endorsed by the scientific community (Cornell v 360 W. 51st St. Realty, LLC, 22 NY3d 762 [2014]), but whether it is generally accepted as reliable (People v Wernick, 89 NY2d 111 [1996]).

PEER REVIEW

There have been numerous articles published relative to Cybergenetics TrueAllele Casework (see People's Exhibit 15) in all the leading journals of the DNA community, including the American Journal of Human Genetics, the Journal of Forensics Sciences (the Official Scientific Journal of the American Academy of Forensic Sciences), Forensic Science International: Genetics, Plos One, Genometrics, The Croatian Medical Journal, and Science and

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[4]This was first published in the 1950's, and according to Dr. Perlin, "he would be hard pressed to know any field where MCMC has not been used" (October 6, 2014 Transcript, p. 45).

[5]An algebraic ($p(A/B) = p(B/A)\,p(A)/p(B)$) way to work out the likelihood of something in the face of some particular piece, or pieces, of evidence in use since 1812.

Justice. Prior to being published, each of these articles had to be reviewed by two anonymous scientists in the DNA community to ensure a quality assurance that the manuscript and scientific results are up to the standards of the level of that journal, that the results are reported properly, that the results make sense, and that the conclusions that are drawn from the data are supported by the data. In addition thereto, there have been numerous forensic collaborations (see People's Exhibit 16) with other scientists in the DNA community.

VALIDATION STUDIES

Dr. Perlin testified that Cybergenetics TrueAllele Casework's source code is a trade secret, which he will not reveal. The Defendant argues that without that code, no outside scientist can replicate or validate Dr. Perlin's methodology and, therefore, Cybergenetics TrueAllele Casework evidence should not be admissible in this case. However, scientists can, and have, validated the reliability of Cybergenetics TrueAllele Casework even though the source code underlying the process is not available to the public. Cybergenetics TrueAllele Casework has undergone 20 unpublished validating studies and 6 published validation studies (People's Exhibits 3, 4, 5, 6, 7, 27) to confirm that the laboratory is producing the same type of reliable results or determining the extent of reliability for the method or technology that's already been developmentally validated. Four of these were independent validation studies - Massachusetts, Virginia, and 2 by the New York State Police as addendums to People's Exhibit 5 (People's Exhibits 30 and 31). Without exception, each of these validation studies found Cybergenetics TrueAllele Casework to be sensitive (the extent to which interpretation identifies the correct person) and specific (the extent to which the interpretation does not misidentify the wrong

person). And Cybergenetics TrueAllele Casework was shown to have provided objectivity, achieved greater genotype accuracy, and proved reproducible (the extent to which the interpretation gives the same answer to the same question).

SCIENTIFIC COMMUNITY

On May 20, 2011 the New York State Commission on Forensic Science DNA Subcommittee unanimously approved Cybergenetics TrueAllele Casework for use by the New York State Police for their forensic casework. Pursuant to Executive Law § 995-b(13), this Subcommittee was comprised of a chair appointed by the chair of the Commission who then appointed six other members to the subcommittee, one of whom shall represent the discipline of molecular biology and be appointed upon the recommendation of the commissioner of the department of health, one of whom shall represent the discipline of population genetics and be appointed upon the recommendation of the commissioner of the department of health, one of whom shall be representative of the discipline of laboratory standards and quality assurance regulation and monitoring and be appointed upon the recommendation of the commissioner of the department of health, one of whom shall be a forensic scientist and be appointed upon the recommendation of the commissioner of the department of health, one of whom shall be representative of the discipline of population genetics and be appointed upon the recommendation of the commissioner of criminal justice services and one of whom shall be representative of the discipline of forensic science and be appointed upon the recommendation of the commissioner of criminal justice services - all respected scientists who do research on different areas of DNA analysis. The subcommittee in this case consisted of Jack Ballantyne,

Ph.D., Chairman, George Carmody, M.D., Eric Buell, Ph.D., Charles Hirsch, Ph.D., Mark Batzen, Ph.D., Anne Welsh, Ph.D., and Ranajit Chakraborty, Ph.D. (Defendant's expert). It was their duty to assess and evaluate all DNA methodologies proposed to be used for forensic analysis. In that regard, it reviewed and evaluated Cybergenetics TrueAllele Casework over 1 ½ years and heard presentations by Dr. Perlin, Joe Galdi (runs the DNA laboratory in Suffolk County), J. D. Bellvose, Russ Gedick (the DNA technical lead at the Albany laboratory), and Dr. Barry W. Ducerman (Director of the Biological Science Section of the New York State Police Forensic Investigation Center) before recommending its use by the New York State Police.

Thereafter, on July 15, 2011 the full Commission on Forensic Science unanimously approved Cybergenetics TrueAllele Casework technology for forensic casework without any mention of the type of forensic casework and without limitation (People's Exhibit 12). This full Commission was composed of the chair of the New York State Crime Laboratory Advisory Committee, the director of a forensic laboratory located in New York State, the director of the Office of Forensic Services within the Division of Criminal Justice Services, two scientists having experience in the areas of laboratory standards or quality assurance regulation and monitoring, a representative of a law enforcement agency, a representative of prosecution services, a representative of the public criminal defense bar, a representative of the private criminal defense bar, two members-at-large, and an attorney or judge with a background in privacy issues and biomedical ethics. The committee in this case consisted of Sean M. Byrne, Esq., Chairman, Gina L. Bianchi, Esq., Kathleen Corrado, Ph.D., Joseph D'Amico, Hon. William T. Fitzpatrick, Richard W. Jenny, Ph.D., Hon. Peter J. McQuillan, Hon. James A. Murphy, III, Peter Neufeld, Esq., Marvin E. Schechter, Esq., Barry Scheck, Esq., Nirav R. Shah, M.D.,

M.P.H., Marina Stajic, Ph.D., and Ann Willey, J.D., Ph.D. It was their duty, *inter alia*, to evaluate and approve or reject any forensic methodology. In that regard, it sets minimum standards designed to increase and maintain the effectiveness, efficiency, reliability, and accuracy of forensic laboratories in accordance with the highest scientific standards practicable.

This approval by the New York State Commission on Forensic Science DNA subcommittee and the full Commission on Forensic Science clearly constitutes "general acceptance." Nevertheless, the New York State Police still undertook three separate validation studies specifically designed around the Quality Assurance Standards of the FBI to ensure that Cybergenetics TrueAllele Casework was a reliable way to interpret mixed and single-source DNA evidence and provide its DNA laboratory with a standardized interpretation approach that thoroughly examined data, eliminated examiner bias, accurately preserved identification information, quantified match strength (whether positive and negative) and yielded reproducible results prior to its use thereof. These studies proved that Cybergenetics TrueAllele Casework is reliable, and that is the standard for admissibility (see People v Wernick, 89 NY2d 111 [1996]).

LEGAL ACCEPTANCE

Cybergenetics TrueAllele Casework has also been used in the World Trade Center 9/11 victim identification,[6] the Allegheny County Crime Lab in Pittsburgh, the country of Oman, the United Kingdom Forensic Science Service and 23 states[7] (People's Exhibit 29, page 4). In

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[6]The Office of the Chief Medical Examiner of the City of New York asked Cybergenetics TrueAllele Casework to deconvolute mixtures from victim remains from the site relative to the 2,700 missing persons.

[7]Kern County, California and the State of Virginia are presently using Cybergenetics TrueAllele Casework for all forensic casework.

that regard, there have been admissibility hearings in Pennsylvania, Virginia, California, Ohio, and, now, New York, as well as in Northern Ireland, Australia, and England, with Cybergenetics TrueAllele Casework being admitted in all but the England case (there was no decision in that case).

This case is similar to the situation the Court of Appeals was presented with, and sanctioned, in People v Wesley, *supra*. At the time of the hearing in that case only three laboratories in the world were performing RLFP based DNA typing. The only articles written on the subject were authored by scientists affiliated with those laboratories and many law enforcement entities, including the FBI, had not employed the technique. At the time that Court considered the issue the scientific community had not widely adopted the procedure, but it still found that RLFP based profiling had been accepted as reliable within the scientific community.

EXPERT TESTIMONY

While the superiority of continuous systems like Cybergenetics TrueAllele Casework has been acknowledged for over a decade, implementation has lagged (People's Exhibit No. 25). The problem, according to Dr. Perlin, is one of education, not lack of general acceptance. In that regard, Dr. Perlin has given over 50 talks, testified in numerous court proceedings (domestically and internationally), and has been the keynote speaker for the American Academy of Forensic Sciences, the International Conference on Forensics Inference and Statistics, and the International Symposium on Human Identification (Promega). He has even been a lecturer for the American Bar Association at several continuing legal education programs.

The National Institute of Standards and Technology (NIST), the scientific wing of the United States Department of Commerce, whose mission is to advocate science in the United States and guide the forensic DNA community, uses Cybergenetics TrueAllele Casework to insure that its scientific reference material used in testing laboratories is what they describe it as (to assess a mixture weight and thereby determine the variability of different amplifications). This means that Cybergenetics TrueAllele Casework is used, albeit indirectly, by almost every laboratory in the United States since they all obtain control samples from NIST. Michael D. Coble and John M. Butler, both from the NIST Applied Genetics Group, gave a presentation entitled "Exploring the Capabilities of Mixture Interpretation Using True Allele Software" on September 3, 2011 at the 24th Congress of the International Society for Forensic Genetics. They concluded by summarizing their results and finding that Cybergenetics TrueAllele Casework makes better use of the data than the RMNE (random man not excluded) approach, the statistical equivalent of CPI. And this was not the only time that NIST acknowledged the effectiveness and reliability of Cybergenetics TrueAllele Casework - at the Green Mountain DNA conference on July 28 - 30, 2014 in Burlington, Vermont, Michael D. Coble presented the results of a study entitled "Mix 13: Overview and Lessons Learned" and reported that Cybergenetics TrueAllele Casework was the only expert system to correctly exclude the suspect in a controlled study involving 100 laboratories, it made poster presentations at conferences for the International Symposium on Human Identification and the International Society for Forensic Genetics, and it even put on a webinar two-part series pertaining to probabilistic gene typing and advocated the use of this method (October 8, 2014 Transcript, page 561).

FINDINGS

The evidence shows that computerized probabilistic approaches and likelihood ratio principles used by Cybergenetics TrueAllele Casework are superior to current methods. Moreover, Cybergenetics TrueAllele Casework has been demonstrated to be one of, if not, the most advanced method of interpreting DNA profiles from mixed and low-template DNA. It has been proved to be more accurate than CPI and CLR, preserves more of the identification information, eliminates examiner bias, produces a match value which human review may not, and permits standardization of mixture reporting whereas human review approaches can lead to very different match statistics on the same DNA data.

Here, there is a plethora of evidence in favor of Cybergenetics TrueAllele Casework, and there is no significant evidence to the contrary. The Court recognizes that the lack of critical work does not guarantee the absence of controversy; however, the reality is that Cybergenetics TrueAllele Casework has been around since 1999, a time frame that would certainly allow for a thorough critical review to be put forth if it was warranted.

Based upon the evidence produced at this hearing, the Court finds:

(1) that Cybergenetics TrueAllele Casework has been empirically tested and found to be relevant, reliable, and accurate,

(2) that Cybergenetics TrueAllele Casework has been subjected to favorable peer review and extensive publication,

(3) that Cybergenetics TrueAllele Casework's average efficacy has been proved to be at least 4 ½ orders of magnitude more efficacious than human review on the same data,

(4) that Cybergenetics TrueAllele Casework has been validated and found to be reproducible,

(5) that the various scientific principles used by Cybergenetics TrueAllele

Casework have been long ago accepted and endorsed by the scientific community, and

(6) that the on-going administrative investigation at the New York State Police Forensic Investigation Center has no bearing on the validation studies performed in July 2013 and/or March 2014 (see Affidavit of Timothy J. Munro, sworn to January 23, 2015).

CONCLUSION

Accordingly, the Court finds that Cybergenetics TrueAllele Casework is not novel but instead is "generally accepted" under the Frye standard. The Court therefore DENIES the Defendant's Motion to Preclude, subject to sufficient foundational showings by the People as to their experts' qualifications and adherence to accepted procedures for collection, storage, or analysis of such evidence (cf People v Kelly, 288 AD2d 695 [3rd Dept 2001]).

THIS SHALL CONSTITUTE THE DECISION AND ORDER OF THE COURT.

Dated: February 9, 2015
at Cooperstown, New York

ENTER

Michael V. Coccoma

Hon. Michael V. Coccoma
Supreme Court Justice

To: John Wakefield
Frederick Rench, Esq.
Catherine Bonventre, Esq.
Peter H. Willis, ADA, Schenectady County District Attorney's Office
Clerk of the Court

TABLE A

People's Exhibits:

1. Curriculum Vitae - Dr. Mark W. Perlin
2. Computer Interpretation of Quantitative DNA Evidence
3. PLOS One - "An Information Gap in DNA Evidence Interpretation"
4. Journal of Forensic Sciences - "Validating TrueAllele DNA Mixture Interpretation"
5. Journal of Forensic Sciences - "New York State TrueAllele Casework Validation Study"
6. Science and Justice - "DNA mixture genotyping by probabilistic computer interpretation of binomially-sampled laser captured cell populations: combining quantitative data for greater identification information"
7. Journal of Forensic Sciences - "TrueAllele Genotype Identification on DNA Mixtures Containing Up to Five Unknown Contributors"
9. Virginia TrueAllele Validation Study: Casework Comparison
10. PLOS One - "TrueAllele Casework on Virginia DNA Mixture Evidence: Computer and Manual Interpretation in 72 Reported Criminal Cases"
11. DNA Subcommittee approval letter
12. Commission on Forensic Science approval letter
15. Citation Index
16. Forensic Collaborations
17. Workshop announcement
18. 9th International Conference on Forensic Inference and Statistics Abstracts
19. Exploring the Capabilities of Mixture Interpretation Using TrueAllele Software
20. The New Standard Reference Material 2391e:PCR-based DNA Profiling Standard

21. Examination of DNA Mixture Proportion Variability Using Multiple STR Typing Kits and NIST Standard Reference Material 2391c, Component D

22. Certificate of Analysis

23. Mix13: Overview and Lessons Learned

24. Annual Review of Statistics and Its Application 2014 - "Statistical Evaluation of Forensic DNA Profile Evidence"

25. Forensic Science International: Genetics - "The interpretation of single source and mixed DNA profiles"

26. Science and Justice - "A comparison of statistical models for the analysis of complex forensic DNA profiles"

27. Establishing the Limits of TrueAllele Casework: A Validation Study

28. Science and Justice - "A MCMC method for resolving two person mixtures"

29. TrueAllele Casework Supporting Data/Validation

30. New York State Police Crime Laboratory System TrueAllele Casework Validation Addendum - two and three person mixtures

31. New York State Police Crime Laboratory System True Allele Casework Validation Addendum - four person mixture and familial study

Defendant's Exhibit:

A. Forensic Science International: Genetics - "DNA commission of the International Society of Forensic Genetics: Recommendations on the evaluation of STR typing results that may include drop-out and/or drop-in using probabilistic methods"

At a Term of the Supreme Court of the State of New York held for the County of Schenectady, New York at Chambers in the Village of Cooperstown, New York on the 13 day of March, 2015

PRESENT: HON. MICHAEL V. COCCOMA
SUPREME COURT JUSTICE

STATE OF NEW YORK
SUPREME COURT: COUNTY OF SCHENECTADY

THE PEOPLE OF THE STATE OF NEW YORK

-against-

DECISION AND ORDER

JOHN WAKEFIELD

Indictment No. A-812-29

Defendant

Notwithstanding the fact that the Court has already ruled on the Defendant's right to the Cybergenetics TrueAllele Casework's source code (see Decision and Order dated February 9, 2015 at pages 6 - 7), and ignoring the timeliness issue, the Court will address this Motion on the merits.

The Defendant argues that the TrueAllele Casework System is an expert system which interpreted DNA data in this case, drew inferences from it, and reached the conclusions directly connecting Mr. Wakefield to the crime with which he has been charged. To begin with, such an argument ignores the human element, to wit: the analyst. Secondly, the DNA results from Cybergenetics TrueAllele Casework is not a hearsay statement by an individual against the

Defendant - it is a scientific report generated from the source code. Thirdly, and more importantly, the Defendant has not forfeited his right to confrontation since he will have an opportunity to cross-examine not only the analyst, but the scientist who developed the software.

Simply put, the Defendant's Crawford argument is misplaced. The source code is not a witnesses, it is not testimonial in nature, and it is not "a surrogate for accusatory in-court testimony." It is only the software that drives a computer program that analyzes DNA with the input and assistance of an analyst. And the Cybergenetics TrueAllele Casework report does not accuse anyone, it simply computes a match likelihood ratio using a probabilistic model.

Accordingly, the Motion to allow the Defendant's expert access to the Cybergenetics TrueAllele Casework source code is DENIED once again.

THIS SHALL CONSTITUTE THE DECISION AND ORDER OF THE COURT.

Dated: March 13, 2015
at Cooperstown, New York

ENTER

Hon. Michael V. Coccoma
Supreme Court Justice

To: John Wakefield
Frederick Rench, Esq.
Catherine Bonventre, Esq.
Peter H. Willis, ADA, Schenectady County District Attorney's Office
Clerk of the Court

The documents upon which this Decision and Order is based have been filed in the Office of the Schenectady County Clerk:

1. Memorandum of Law dated March 10, 2015
2. Letter from Peter H. Willis, Assistant District Attorney, dated March 13, 2015 showing copy to Defendant.

FILED COURT OF COMMON PLEAS
CUYAHOGA COUNTY, OHIO

STATE OF OHIO 2014 OCT 10 A 9:25

CLERK OF COURTS
CUYAHOGA COUNTY

Plaintiff

vs.

MAURICE SHAW

Defendant.

CASE NO.: CR – 13 – 575691

JUDGE: MAUREEN CLANCY

ORDER

* * * *

This cause is before the Court on Defendant's Motion in Limine, filed on July 10, 2014, and the State's Brief in Opposition, filed on July 23, 2014, and Defendant's Motion to Compel TrueAllele's source code, filed on June 6, 2014, and the State's Motion to Quash, filed on June 19, 2014, and all other supplemental filings related to these issues. In his brief in support of his Motion in Limine, Defendant requests that the Court exclude any and all evidence related to TrueAllele Casework System (hereafter referred to as "TrueAllele") pursuant to *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L.Ed.2d 469 (1993). In his brief in support of his Motion to Compel, the Defendant is requesting an order that the State reveal TrueAllele's source code. Defendant requested a pretrial hearing on his Motion to Compel and his Motion in Limine. A hearing was held on Defendant's Motion to Compel on June 30, 2014. A hearing was held on Defendant's Motion in Limine (hereafter referred to as "Daubert

CR13575691-A 86272780

Hearing") July 28, 2014 through July 31, 2014 and on August 15, 2014. At the Daubert Hearing the State called two witnesses, Dr. Mark Perlin and Mr. Jay Camponera. The Defendant presented two witnesses as well, Dr. Chakraborty and Dr. Dan Krane.

After the conclusion of the Daubert Hearing, both the State and the Defendant submitted proposed findings of fact and conclusions of law.

FACTUAL AND PROCEDURAL BACKGROUND

The Defendant in the present case is under indictment for the following charges: Aggravated Murder, Murder, Felonious Assault, and Kidnapping. The alleged incident occurred on or about June 6, 2012, as stated in his indictment. The dispute before the Court developed based upon inconclusive DNA test results performed by both the Cuyahoga County Medical Examiner's Office (hereafter referred to as "ME") and Sorenson Genomics, LLC (hereafter referred to as "Sorenson") on two mixed samples of DNA evidence collected at the crime scene, namely from a doorknob and under the victim's fingernail. The ME performed the first comparison and Sorenson performed the following comparison. Both tests produced inconclusive results. The State then submitted the same DNA material from Sorenson to Cybergenetics for further analysis. Dr. Mark Perlin is the founder of Cybergenetics and the creator of TrueAllele Casework System (hereafter referred to as "TrueAllele"). Cybergenetics analyzed the data, and Defendant now seeks to prohibit the State from introducing the results of the Cybergenetics' testing.

STANDARD OF ADMISSIBILITY

"The admissibility of expert testimony is a matter committed to the sound discretion of the trial court," *State v. Wangler*, 3rd Dist. Allen No. 1-11-18, 2012-Ohio-4878, ¶ 56, citing *Valentine v. Conrad*, 110 Ohio St.3d 42, 2006-Ohio-3561, 850 N.E.2d 683, ¶ 9. Evidence Rules 402, 403, and 702 govern the admissibility of scientific evidence in Ohio. *State v. Williams*, 4 Ohio St.3d 53, 446 N.E.2d 444, 447 (1983). Evid.R. 402 provides:

> All relevant evidence is admissible, except as otherwise provided by the Constitution of the United States, by the Constitution of the State of Ohio, by statute enacted by the General Assembly not in conflict with a rule of the Supreme Court of Ohio, by these rules, or by other rules prescribed by the Supreme Court of Ohio. Evidence which is not relevant is not admissible.

However, Evid.R. 403(A) "mandates the exclusion of relevant evidence if its probative value is outweighed by danger of unfair prejudice, confusion of the issues, or misleading the jury." *Williams* at 447. Finally, Evid.R. 702 provides:

> A witness may testify as an expert if all of 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. 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.

The standards for admitting expert testimony vary. "The earliest pronouncement on the admissibility of recently ascertained or applied scientific principles can be found in *Frye* v. *United States*:

> [j]ust when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs."
>
> *Williams* at 446, citing *Frye*, 54 U.S. App. D.C. 46, 47, 293 F. 1013, 1014 (1923):

The *Williams* court rejected the *Frye* standard, preferring a more flexible approach. "The 'Frye test' has been criticized ... by courts and commentators alike." *Williams* at 57. The court explained that it

> refused to engage in scientific nose-counting for the purpose of deciding whether evidence based on newly ascertained or applied scientific principles is admissible. We believe the Rules of Evidence establish adequate preconditions for admissibility of expert testimony, and we leave to the discretion of this state's judiciary, on a case by case basis, to decide whether the questioned testimony is relevant and will assist the trier of fact to understand the evidence or to determine a fact in issue. *Id.* at 58.

The United States Court of Appeals for the Second Circuit also rejected an invitation to adopt the *Frye* standard. *United States v. Jakobetz*, 955 F.2d 786, 1992 U.S. App. LEXIS 322. The Court stated:

> [a]lthough we realize that DNA evidence does present special challenges, we do not think that they are so special as to require a new standard of admissibility. Despite the difficulties involved in cases with novel, complex and confusing evidence, the jury must retain its fact-finding function. *Id. at 796.*

In determining whether the opinion of an expert is reliable under Evid.R. 702(C), a trial court, acting as a gatekeeper, examines whether the expert's conclusion is based on scientifically valid principles and methods. *Valentine* at ¶ 16, citing *Miller v. Bike Athletic Co.*, 80 Ohio St.3d 607, 616, 687 N.E.2d 735 (1998). "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 subjected to peer review, (3) whether there is a known or potential rate of error, and (4) whether the methodology has gained general acceptance." *Miller* at 611, citing *Daubert* at 593-94. Widespread acceptance can be an important factor in ruling particular evidence admissible, and "a known technique which has been able to attract only minimal support within the community," *United States v. Downing*, 753 F.2d 1224, 1238, 1985 U.S. App. LEXIS 298939 (1985), may properly be viewed with skepticism. Ultimately, the Court must also be "mindful" of the "danger of unfair prejudice, confusion of the issues, or [potential for] misleading the jury." *Daubert* at 595.

"The inquiry envisioned by Rule 702 is, we emphasize, a flexible one. Its overarching subject is the scientific validity -- and thus the evidentiary relevance and reliability -- of the principles that underlie a proposed submission. The focus, of course, must be solely on principles and methodology, not on the conclusions that they generate." *Daubert* at 594-95.

The Supreme Court of the United States has explained that not every factor of *Daubert* needs to be considered in determining the reliability of testimony. *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 119 S. Ct. 1167, 143 L. Ed. 238, 1999 U.S. LEXIS 2189 (1999). The Court concluded that:

> a trial court may consider one or more of the more specific factors that Daubert mentioned when doing so will help determine that testimony's reliability. But, as the Court stated in Daubert, the test of reliability is "flexible," and Daubert's list of specific factors neither necessarily nor exclusively applies to all experts or in every case. Rather, the law grants a district court the same broad latitude when it decides how to determine reliability as it enjoys in respect to its ultimate reliability determination. See *General Electric Co. v. Joiner*, 522 U.S. 136, 143, 139 L. Ed. 2d 508, 118 S. Ct. 512 (1997). *Kumho Tire* at 141-42.

The Supreme Court of the United States has also explained that cross-examination of an expert witness and cautionary instructions to the jury are effective tools for attacking shaky, but admissible evidence. See *Rock v. Arkansas*, 483 U.S. 44, 61, 107 S. Ct. 2704, 97 L. Ed. 2d 37 (1987).

"Generally, 'courts should favor the admissibility of expert testimony whenever it is relevant and the criteria of Evid.R. 702 are met.'" *Wangler* at ¶ 57, citing *State v. Nemeth*, 82 Ohio St.3d 202, 207, 694 N.E.2d 1332 (1998).

EXPERT TESTIMONY

Dr. Mark Perlin testified for the State of Ohio. Dr. Perlin testified as to his credentials, background, work experience, and education. Dr. Perlin testified that he has a Bachelor's Degree in Chemistry, a Ph.D. in Mathematics, a Medical Degree and a Ph.D. in Computer Science. T. 35. Dr. Perlin testified that he is chief scientific officer and chief executive officer at Cybergenetics which he founded twenty years ago. T. 35,

36. He testified that about twenty to twenty-five years ago he moved into the area of applying computers and computation to solving problems involving the human genome. T. 36. His company uses computers and mathematics to analyze DNA data as opposed to human review. T. 37.

In 1999 he began working on the DNA mixture problem where two or more people contributed their DNA to a sample. T. 40. TrueAllele Casework was started in 1999 which was designed for evidence mixtures and less certain evidence. T. 40. The TrueAllele System uses a computer to assess evidence objectively. In this system, the computer writes down its results and then makes comparisons with whatever standards are appropriate. T. 311. It is computer analysis of the same data that a human analyst reviews. T. 245. His system, TrueAllele, is based on Bayesian Theory and Markov Chain Monte Carlo, two established scientific models, to determine the probabilities to attach to each allele pair. T. 89, 90.

Dr. Perlin testified that the TrueAllele System is able to determine error rates under different conditions for false positives and negatives regardless of whether they were two, three, or five contributors or high or low template. T. 265. Other validation studies exist that test the system's specificity, sensitivity, reproducibility, which pertain to error rates. T. 287.

Dr. Perlin has testified in about twenty criminal trials and hearings and has worked on about two hundred cases and filed about one hundred-fifty reports. T. 43, 45. He testified in criminal cases in Pennsylvania, in Federal Court, Virginia and California. T. 43. He has been qualified as an expert in DNA evidence interpretation and the likelihood ratio. T. 43. He has also testified in the United Kingdom and Australia. T.

44. He testified in cases involving mixture evidence using his TrueAllele System. T. 44. Over a ten year period, up until five years ago, TrueAllele has gone through twenty-five versions of expanding the probability model, testing it and waiting for a point when it was giving appropriate answers on large test sets. T. 109.

Dr. Perlin's probabilistic genotyping and DNA analysis of mixtures is different from human interpretation. The difference is only the interpretation and not the collection. T. 45, 46. The computer looks at the information differently than human review. T. 82. He further testified that whether it is a person or a machine, interpretation then begins to determine the nature of the genetic contributors that match logistics that are present in data. T. 46.

In the present case, Dr. Perlin was given the data from Sorenson for TrueAllele to interpret. T. 46. Dr. Perlin testified that there are many different methods of human interpretation and there are different methods of computer interpretation. T. 46. Thresholds used in human review are not used with a computer. Rather, every last possibility is examined. T. 82. The TrueAllele System considers approximately one hundred variables, but it depends on the amount of data that it is presented. T. 385.

Dr. Perlin has written papers that have gone through a peer review process and published in scientific journals. T. 117. A validation paper is a validation study that has been submitted to a scientific journal for approval in the peer review process and ultimately published in a journal. T. 117. He has been published in well-regarded journals. T. 118. TrueAllele has been validated and there are five published peer-reviewed validation papers on the TrueAllele Casework System. T. 119, 167, 177. Dr. Perlin described each paper. T. 1-177. The five papers "go beyond an internal

validation." T. 178. Dr. Perlin began validating his system from its inception. T. 109. He received a grant from the National Institute of Justice to test the system on data generated from ten different laboratories or from his own laboratory including samples of known composition and casework. T. 109. Known compositions and casework samples are types of evidence used in validations. T. 110. Dr. Perlin has been involved in studies and prepared reports other than peer reviewed papers. T. 117.

In one paper, the results showed that the computer is more sensitive in being able to detect lower quantities of DNA whereas human review essentially stopped working at around one hundred picograms of DNA which is just the beginning of a low template region. T. 124. Unlike the human review, TrueAllele computer interpretation extended all the way through low template range.

Dr. Perlin testified that "specificity is the extent to which the interpretation doesn't misidentify and get the wrong person. That it finds true exclusions without falsely including somebody." T. 184.

TrueAllele is in use in Curran County, California where the analysts test the system report cases using the system. T. 202. It is also used in Virginia by the State Department of Forensic Science with trained analysts who conduct their own studies and their own validations and it is used in casework. T. 202. There have been over twenty studies done on the system's reliability.

Dr. Perlin testified that there have been five admissibility hearings where TrueAllele was admitted into evidence, although he was not sure of the exact number of admissibility hearings because the California and Virginia groups are not keeping statistics on it. New York State has purchased the TrueAllele System but is not currently

live with the system. TrueAllele is also being used in the middle-eastern country of Oman, and is being used in Australia, England and Ireland. T. 203.

Cybergenetics was awarded various grants from the National Institute for Justice specifically for testing software interpretation systems, and the FBI has purchased the TrueAllele databank system. T. 332, 333.

A study from the National Institute for Science and Technology ("NIST") on stochastic thresholds indicated that the probabilistic genotyping is moving forward in the field. T. 339. NIST considered probabilistic genotyping a permissible approach to DNA interpretation. T. 176. NIST has its own in-house TrueAllele computer. They have used it to characterize the standard reference materials as mixtures in developing the materials for the forensic community. Through the use of TrueAllele, NIST knows what is in the mixture that they give to other labs. T. 281. NIST conducted its own independent study concerning TrueAllele. T. 285. A "Forensic czar" at NIST indicated in a presentation that the community will be moving forward with probabilistic genotyping. T. 339.

Dr. Perlin testified that employing a stochastic threshold method for DNA interpretation is a generally accepted practice amongst crime labs and is uniformly rejected by the community of scientists who develop the methods as something that is antiquated and cannot work. T. 331. The push for probabilistic genotyping has started in the last year from NIST and Scientific Working Group on DNA Analysis Methods (hereafter "SWGDAM"). T. 341. Ten labs have purchased TrueAllele and three are using it. T. 342.

TrueAllele started in the State of New York in 2010 and gained approval from DNA subcommittee of the New York State Forensic Science Commission for its use for

forensic casework. T. 206. Dr. Perlin testified in great detail the steps necessary for approval for forensic casework in New York. T. 220.

When a lab purchases TrueAllele, it must perform some form of validation on the equipment to be in compliance with the FBI quality assurance standards; they should be measuring how well the system works under a variety of different mixtures. T. 277. Other independent studies have been conducted by other people on the TrueAllele System. T. 278.

Dr. Perlin testified that only ten labs are using TrueAllele at this time. T. 290. He explained that crime labs change very slowly and unless there is a push from the top they are fairly comfortable with the methods that they have. He further testified that it was actually quite good to get ten labs interested in testing and using the system.

Dr. Perlin testified that the direction of the scientific community is moving toward using computers in developing or in analyzing DNA mixtures. T. 298. Regarding general acceptance, TrueAllele was used in mass casualty identification of victims through DNA analysis. T. 299. TrueAllele System was used for the identification of victims in the 9/11 and World Trade Center disasters. T. 301. In addition, probabilistic genotyping and use of computers in interpreting DNA mixtures is a topic at conferences and a subject discussed amongst scientists. T. 298.

TrueAllele has also been involved in over ten defense cases, about half or more involving innocence project cases. Defense attorneys have written about TrueAllele. T. 289.

Dr. Perlin testified that it is his understanding that the FBI and all of the DNA testing laboratories throughout the country will be moving toward some sort of

probabilistic genotyping system but the laboratories are not using any probabilistic genotyping system at this time. T. 335.

Dr. Perlin testified that a scientist can get very close to duplicating his work by reading his work. But, if the scientist has not purchased the system he cannot duplicate it because he does not have all of the engineering details, T. 434.

Dr. Perlin testified that the TrueAllele System has a closed source code. T. 360. The source code is about 170 lines. T. 353. He further testified that the reliability of the source code is determined by testing and validation studies, not by looking at the source code. T. 360. The validity of the source code is assessed by how the program operates, not be reading the text. T. 361. About half a dozen other systems exist that are similar to TrueAllele and some are open source. T. 113. Other closed-source systems exist. T. 115. Dr. Perlin believed the commercial closed-source systems have been validated. T. 115.

Jay Camponera (hereafter referred to as "Camponera") testified for the State. He testified that he works for the New York State Police Forensic Investigation Center as a forensic scientist working in the DNA section where he does research and validation for his lab. T. 656, 657, 658. He has testified approximately 60 times and has been deemed an expert. T. 659. Camponera has a Bachelor's Degree and a Master's of Science Degree with an emphasis on molecular and evolutionary biology. Prior to his current employment, he was a forensic analyst for the University of Maine Molecular Forensic Laboratory. T. 657. Currently his lab uses an interpretation process based on thresholds where they apply a threshold to their data and they do not use anything below that threshold for statistical purposes. They then calculate statistics with a program called

Pop Stats. T. 660. In his role in his lab, he has looked at other technology, such as TrueAllele. T. 660. Camponera testified that his lab validated TrueAllele and it has been approved for use in casework in the State of New York. T. 660. TrueAllele was approved by the New York State DNA Subcommittee in May, 2011. T. 660. TrueAllele has not gone live as they are in the process of finalizing the protocols and doing training for staff. T. 662.

Camponera testified that the trend of the forensic science community, which NIST, who is considered the "scientific wing of the United States Department of Commerce," T. 667, and essentially leads the community in forensic science, is moving towards probabilistic genotyping methods, and TrueAllele is one of those methods. T. 672. The trend is not just in the United States but also internationally. T. 674. Camponera testified that other labs have purchased TrueAllele and 13 states have received TrueAllele reports. T. 676. Two states are actively using TrueAllele and issue their own reports. T. 677. With TrueAllele, a lab can either purchase their equipment or can use the services of TrueAllele by sending them their data. T. 677.

Three admissibility hearings have been held and in all three cases, TrueAllele has been admitted. T. 679. Camponera testified that TrueAllele is much more sensitive to identify the correct person. T. 681. He further testified that the movement in his field is towards probabilistic genotyping which TrueAllele is one method. T. 707.

Camponera testified that "the best way for him to evaluate source code if you want to call it that, is to look at the actual data, the results, and to show that it is specific and sensitive and accurate and so forth." T. 719.

All of the mixtures that Camponera looked at and the single source data were created in his laboratory by him. T. 730.

Camponera's studies have not been published and have not been subject to peer review outside of his laboratory. T. 735, 736.

Dr. Raj Chakraborty testified on behalf of the Defendant. T. 5. Chakraborty testified to his credentials and all of the work that he has performed in his field. T. 5 – 9. He testified that he is currently employed with the University of North Texas Health and Science Center and a professor in the department of molecular and medical genetics. He is also the director of the Center for Computational Genomics at the Institute of Applied Genetics at the same institution. T. 6. He published over 300 papers that relate to DNA forensics. T. 9. He was a faculty member for the Scientific Working Group on DNA Analysis Methods (hereafter referred to as "SWGDAM"). T. 9. SWGDAM sets forth guidelines for laboratories across the country. T. 9. Dr. Chakraborty has been qualified as an expert over 150 times. T. 10.

Dr. Chakraborty testified that he reviewed the lab results in the instant case from Sorenson. T. 11. He testified that the items contained relatively low quantities of DNA. T. 13. He referred to such amounts of DNA as low copy number or low input DNA. T. 13. It is complicated further if there is a mixture. T. 13.

From his research, he has to be very careful about typing low copy number DNA or low input DNA samples particularly if these samples contain DNA mixture for multiple individuals. T. 13.

The criticisms that Dr. Chakraborty has of TrueAllele applies to all types of studies whether it be three person, two person, mixtures, high template, and low template. T. 59.

On direct examination, Dr. Chakraborty testified while a member of SWGDAM, he approved TrueAllele for case work in New York State labs in 2011 that consisted of DNA from a single individual called single source and included DNA of enough quantity. T. 21. On cross examination, he acknowledged that the samples were mixtures of up to three people; some known and some unknown. T. 61. He acknowledged that there were multiple types of mixtures but the use of the word complex is subjective. T. 61. The samples that he evaluated for approval of TrueAllele in 2011 did not mimic the complexity of the sample in the present case. T. 21.

Another study was done in 2010 prior to its approval and for use of TrueAllele in New York. T. 63. The studies were two-person and three-person mixtures and the evidence items were classified as simple, intermediate, and complex. T. 63. Dr. Chakraborty testified that he did not believe that these samples included low template DNA from the contributors. T. 66.

Dr. Chakraborty testified that TrueAllele is not generally accepted in the scientific community and has not been subject to rigorous peer review. T. 51, 52. He also testified that the source code is necessary to evaluate the efficacy of the system. T. 53.

He further testified that none of the validations done on TrueAllele, in his opinion, are proper because they do not give full details of the scenarios of the cases examined, the list of variables and so on. So he would not call them proper validation, rather partial validation. T. 58

Dr. Chakraborty testified that of all of the laboratories only three laboratories are using TrueAllele on a regular basis. The rest of the community uses other probabilistic genotyping or other methods of interpretation.

General acceptance is revealed by the expert opinion. Dr. Chakraborty testified "for example a person of my experience of 40 years of DNA research who testified for prosecution very frequently do no longer approve of TrueAllele. These are indications of lack of general acceptance." T. 84.

NIST is a federal agency which would advise the Federal Bureau of Investigation and thus far the FBI has not adopted TrueAllele for case work. T. 130. Dr. Chakraborty testified that it is his opinion as of now, probabilistic genotyping for those types of cases with closed source and unknown application of variables still need to be worked out. T. 130.

Dr. Chakraborty testified that in his opinion with respect to TrueAllele it is impossible to recreate results that are rendered without the source code. T. 143. He further testified that without the source code it is impossible to validate the answer. T. 143. Dr. Chakraborty testified that there is no way to validate TrueAllele without having the source code. T. 145. Dr. Chakraborty testified that Plus One is a highly regarded scientific journal and he is "intrigued as to how TrueAllele papers got in Plus One without" revealing the source code. T. 71.

Other systems exist that do not reveal the source code. T. 71. Genemapper is a software that calls alleles from experiments done on specific sequencer machines. T. 72. It has been validated without revealing the source code. T. 72, 147, 148. Dr. Chakraborty testified that it can be validated with compromised samples, pristine samples

mixtures and so on. T. 148. Thus, a way to validate the system without the source code is "by using it and testing it, when you have knowns and you can compare the results with what you know." T. 148.

Dr. Dan Krane testified that he is the president and CEO of a consulting company that does business as forensic bioinformatics and a full professor in the Department of Biological Sciences at Wright State University. He also has an affiliate appointment in the computer science department at Wright State University. T. 5. Over the years he has published approximately 40 research papers in the peer review journals. T. 6. Dr. Krane has given over hundreds of presentations over the years and DNA profiling is frequently the topic. T. 6. He has testified as an expert witness over 100 times over the course of the past 23 years and in many jurisdictions. T. 7.

Dr. Krane testified that the scientific community is unified in its opinion that there is no generally accepted means of attaching a statistical weight to low-template DNA where there is a possibility of allelic drop-out. T. 7.

Dr. Krane testified that a very important part of the scientific method is reproducibility and the idea of the peer review process. T. 14. He further testified that the process is valuable because once a scientist publishes their results they describe how they got those results in the materials and methods section of the paper in a way that other scientists should be able to independently confirm those conclusions. Dr. Krane testified that he has not seen that type of disclosure in the materials and methods sections or in any other documents that he has been privy to regarding TrueAllele. T. 15.

Dr. Krane testified that he reviewed the report from the Sorenson lab and he suggested that there is empirical evidence to support the conclusion that there are at least three, not two, but at least three contributors in the mixture. T. 18.

Dr. Krane testified that with the test results for TrueAllele he simply does not know how they got the answer. T. 33.

Dr. Krane testified that probabilistic genotyping in general has promise and that there is a utility for expert systems like TrueAllele to the extent which they are used as a tool to assist analysts in speeding up their review of case work, but he is concerned in this case where "Sorenson Forensic declines to attach a statistical weight; they decline to say whether [Shaw, the Defendant in this case], is included or excluded as a possible contributor." T. 36. His concern is in this particle case where there is a marginal sample, small amounts of DNA, a complicated mixture and a lot of overlap between two possible contributors. T. 38

Dr. Krane testified that there is not general acceptance within the scientific community with respect to TrueAllele in such complicated situations as the present case. T. 39, 40.

Dr. Krane testified that it is conservative to walk away at some point rather than to take a chance with arriving at an incorrect conclusion. T. 66.

Dr. Krane has not written any papers or peer reviewed any papers regarding probabilistic genotyping methods for determining DNA mixtures. T. 68.

Dr. Krane testified that it is possible that TrueAllele can do things that human catalysts cannot do. T. 72. 73.

Dr. Krane testified that his concern is where TrueAllele arrives at a conclusion that is different from the conclusion of the other independent reviewers. T. 84.

Dr. Krane testified that the source code for TrueAllele is necessary for confrontation and accountability but may be separate from validation. T. 85. His business, Forensic Bioinformatics, works with a closed source system, Genophiler and Genostat. Neither of these systems that he relies on are open source. T. 35. Dr. Krane testified that the difference is that his systems are used as tools, unlike TrueAllele that is a "surrogate for a human expert." T. 35.

Dr. Krane testified that probabilistic genotyping in general looks promising, but he did not state that Dr. Perlin's program is correct, especially for samples where there are clear, obvious, and confounding, complicating features. T. 86.

ANALYSIS

In the instant case, the analysis to determine the admissibility of the evidence begins under Evid.R. 701. In light of Evid.R. 701, and the testimony and evidence presented, there is no dispute that the subject about which Dr. Perlin testified is beyond the knowledge or experience of lay persons and that Dr. Perlin's credentials, experience, training and education qualify him to testify as an expert. The question that must be examined is whether his method for testing DNA is reliable under Evid.R. 702(C). To determine whether his method is reliable, the Court considers the factors as enunciated in *Daubert*.

The first factor to consider is whether the theory or technique has been tested. Dr. Perlin testified that he has five published peer review articles and prepared other internal

validation studies that have not been published. Both the internal validation studies and peer review articles support the position that the TrueAllele Casework System has been tested. Dr. Perlin testified that his system can be replicated if it is purchased. Without purchasing his TrueAllele System, a scientist cannot obtain identical results, but may obtain similar results.

In *U.S. v Bonds*, 12 F.3d 540, 1993 U.S. App. LEXIS 32574, 1994 FED App. 0085P (6th Cir. 1993), the Court examined the issue of testability and determined that "...the FBI's principles and methodology have in fact been tested. The FBI performed internal proficiency testing as well as validation studies and environmental insult studies to determine whether the lab could produce reliable, reproducible results." *Bonds* at 558. Moreover, the Court held that the fact that a dispute exists regarding the methodology proves that it can be tested. The Court stated:

> Defendants vociferously dispute the accuracy of the match results and the adequacy of the testing done, and in refutation have presented evidence about deficiencies in both the results and the testing of the results. Thus, it appears that by attempting to refute the FBI's theory and methods with evidence about deficiencies in both the results and the testing of the results, the defendants have conceded that the theory and methods can be tested. *Bonds* at 559.

Here, despite the testing that has been performed on the TrueAllele System through the validation studies and peer review publications, it is apparent that a conflict exists regarding the methodology of the TrueAllele Casework System for mixtures with low copy DNA. Such conflict amongst experts, including the inadequacies and deficiencies of the system, continues to support the conclusion that the system can be tested. In addition, Dr. Perlin has performed internal proficiency testing as well as validation studies making his system testable. Moreover, similar results can be obtained

without using the TrueAllele System, but comparable and identical results can be obtained using the TrueAllele System.

Thus, the first *Daubert* factor for consideration has been satisfied.

The next factor to consider is whether the theory or technique has been subject to peer review. Dr. Perlin testified that TrueAllele has been subject to peer review; he has five published peer review articles. In addition, Dr. Perlin has prepared other internal validation papers. Although Dr. Perlin has five published peer review articles, "... the existence of publications (or lack thereof) is not dispositive when assessing the reliability of a scientific method." *Wangler* at ¶ 68, citing *Daubert* at 594. Therefore, this Court finds that the second *Daubert* factor has been met.

The third factor to consider is whether there is a known or potential rate of error. TrueAllele's error rate has been calculated in the validation papers. The error rate for technology such as TrueAllele is expressed in terms of sensitivity, specificity and reproducibility. In *Wangler*, the court found "the lack of a known error rate is not fatal to the methodology's reliability." *Wangler* at ¶ 70. Here, however, the testimony and briefs submitted have established the error rate for TrueAllele.

The final factor that a court may consider to determine whether a method or theory is reliable under *Daubert* is whether the methodology has gained general acceptance.

In *Bonds*, the court found that general acceptance encompasses both the theory of DNA profiling and the methodology for conducting DNA testing. See *United States v. Brown*, 557 F.2d 541, 556, 1977 U.S. App. LEXIS 12945 (1977). ("'There must be a demonstrable, objective procedure for reaching the opinion and qualified persons who

can either duplicate the result or criticize the means by which it was reached.'" (emphasis added) (quoting *United States v. Baller*, 519 F.2d 463, 466, (4th Cir.) cert. denied, 423 U.S. 1019, 46 L. Ed. 2d 391, 96 S. Ct. 456 (1975)). *Bonds* at 562. "This view is consistent with *Daubert's* requirement that we determine whether the 'reasoning or methodology underlying the testimony is scientifically valid,' *Daubert* at 2796, and its acknowledgement that a 'known technique that has been able to attract only minimal support in the scientific community may properly be viewed with skepticism.' id." *Id.*

The court further explains the theory of general acceptance:

> [o]ur precedent demonstrates that while ordinarily the principles and procedures must be accepted by a majority of those in the pertinent scientific community, the absence of a majority does not necessarily rule out general acceptance. The general acceptance test is designed only to uncover whether there is a general agreement of scientists in the field that this scientific data is not based on a novel theory or procedure that is 'mere speculation or conjecture.' *Brown* at 559. In some instances, there may be several different theories or procedures used concerning one type of scientific evidence, all of which are generally accepted. None may have the backing of the majority of scientists, yet the theory or procedure can still be generally accepted. And even substantial criticism as to one theory or procedure will not be enough to find that the theory/procedure is not generally accepted. Only when a theory or procedure does not have the acceptance of most of the pertinent scientific community, and in fact a substantial part of the scientific community disfavors the principle or procedure, will it not be generally accepted. See, e.g., *Novak v. United States*, 865 F.2d 718, 725 (6th Cir. 1989) (theories were neither "widely accepted" or "generally accepted" in the medical community). *Bonds* at 562.

The court found that the Government's experts indicated that the FBI's DNA procedures were generally accepted although the defendants' experts criticized the Government's theory of DNA profiling and the basic procedures used by the lab in that case. The court found that the defendants' experts only showed a "substantial controversy over whether the results produced were reliable and accurate," *Bonds* at 562, and that they did not

show that the procedures were not generally accepted. *Id.* Finally, the court held that "questions about the accuracy of results are matters of weight, not admissibility." *Bonds* at 563.

In the present case, after considering the testimony of the witnesses for the State and the Defendant, this Court finds that the general acceptance factor has been satisfied. Ten laboratories have purchased the system, three of which are using it, and it has been admitted in other jurisdictions. See *Commonwealth of Pennsylvania v. Foley*, 38 A.3d 882, 2012 PA Super 31. Dr. Chakraborty testified that while on staff with SWGDAM, he was part of the team that validated the use of the TrueAllele Casework for mixtures. In addition, NIST purchased the TrueAllele System and is using it. Moreover, NIST has recognized probabilistic genotyping.

In *Commonwealth of Pennsylvania v. Foley*, 38 A.3d 882, 2012 PA Super 31, the court admitted the DNA-related testimony of Dr. Perlin. The sample was tested in an FBI laboratory and three experts analyzed the data, including Dr. Perlin who used the TrueAllele System in his analysis. The experts agreed that Foley's DNA profile was consistent with DNA found in the sample, but differed in their estimates of the probability that someone other than Foley would possess DNA matching the DNA found in the sample. The trial court found that Dr. Perlin's methodology was generally accepted. The Superior Court of Pennsylvania found "no legitimate dispute regarding the reliability of Dr. Perlin's testimony," and upheld the ruling of the trial court in admitting Dr. Perlin as an expert witness at trial. *Foley* at 888.

Similarly, this Court finds that Dr. Perlin's methodology is generally accepted; therefore, the final factor of the *Daubert* test has been satisfied.

This Court must also determine whether the probative value is substantially outweighed by the danger of unfair prejudice, of confusion of the issues, or of misleading the jury. In making the Evid.R. 403 determination, this Court finds that the evidence and testimony presented are clearly probative because there is a connection between the Defendant and the crime scene where the evidence was collected. In *United States v. Morrow*, 374 F.Supp. 2d 51, 2—5 U.S. Dist. LEXIS 8327, the court found the DNA evidence had probative value because it showed that certain defendants could not be excluded from a connection to particular articles of evidence. The court explained the evidence was admissible under Fed.R.Evid. 403 because the FBI's theory of matching DNA patterns and procedures were scientifically valid, and because the "'defendants had an opportunity to cross examine all of the Government's witnesses to show why the results were unreliable, the procedures flawed, and the DNA evidence infallible.'" *Morrow* at 64, citing *Bonds* at 568. In *Bonds*, the court explained that "the damaging nature of the DNA evidence to defendants and the potential prejudice does not require exclusion." *Bonds* at 568.

In *United States v. McCluskey*, 954 F. Supp. 2d 1224, 2013 U.S. Dist. LEXIS 88728, the court acknowledged that courts have liberally allowed admission of DNA evidence of relatively low statistical significance. It explained that those cases "properly acknowledge the liberal standard of admission under *Daubert* and the Federal Rules, and the general presumption in favor of admission of 'shaky evidence' with the danger of

undue weight being countered by vigorous cross-examination, presentation of contrary expert witnesses, and the possibility of jury instructions to explain the issues." *McCluskey* at 1274.

In allowing the State's witness to testify at trial in this matter, the Defendant will be provided an opportunity to vigorously cross-examine the State's witness, present contrary evidence and expert witnesses to show why the results of the TrueAllele Casework System are unreliable, the procedures flawed, and the DNA evidence infallible. The Court anticipates that the jury will be extensively educated by both parties on statistical issues and DNA testing and methodologies. If this Court concludes that jurors could be confused by the evidence presented, the Court may deliver "carefully crafted instructions to insure the evidence is properly understood." *Morrow* at 64.

Based on its consideration of the liberal factors set forth in *Daubert* and *Kumho Tire,* and Evid.R. 402, 403 and 702, this Court finds that the State's expert witness and the TrueAllele System are reliable and, therefore, admissible. Further, the expert's testimony is a matter of weight for the jury to consider. Therefore, Defendant's Motion in Limine to exclude any and all evidence related to TrueAllele, filed July 10, 2014, is denied.

Furthermore, the Court is in consideration of Defendant's Motion to Compel the True Allele source code, filed June 6, 2014. Based on the State's Motion to Quash the discovery of the source code, filed June 19, 2014, the Defendant's Reply to the Motion to Quash, filed June 26, 2014, the Defendant's Supplemental Motion to Compel the source code, filed August 14, 2014, and the State's Brief in Opposition to Defendant's

Supplemental Motion to Compel, filed on August 21, 2014, and the oral arguments presented to the Court, the Defendant's Motion to Compel the TrueAllele source code is denied. This Court has previously established that the TrueAllele methodology and the State's witness are reliable without the use of the source code.

IT IS SO ORDERED:

DATE: 10/9/2014

JUDGE MAUREEN CLANCY

PROOF OF SERVICE

I hereby certify that I am this day serving two (2) copies of the within Brief for Respondent upon Counsel for Petitioner in the manner indicated below which service satisfies the requirements of Pa. R. A. P. 121:

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Dated: March __18__, 2016

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