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7 SUPERIOR COURT OF WASHINGTON FOR KING COUNTY

8 STATE OF WASHINGTON,

9 Plaintiff,

10 vs.

11 EMANUEL FAIR,

12 Defendant.

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) No. 10-1-09274-5 SEA
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) FINDINGS OF FACT AND
) CONCLUSIONS OF LAW ON
) DEFENSE MOTION TO COMPEL
) CYBERGENETICS' TRUEALLELE
) CASEWORK SOURCE CODE
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16 A hearing on the Defense Motion to Compel Cybergenetics' TrueAllele Casework Source
17 Code was heard from October 31 to November 28, 2016. After considering the evidence submitted
18 by the parties, to wit: the Defense Motion to Compel Cybergenetics' TrueAllele Casework Source
19 Code, the State's Response to Defense Motion to Compel TrueAllele Source Code, the Defense
20 Reply Regarding Motion to Compel TrueAllele Source Code, the exhibits attached to the pleadings,
21 the testimony from witnesses including Jay Caponera, Nathan Adams, Dan Krane, Mark Perlin,
22 David Balding, Kirk Lohmueller, and Brian Ferguson, the exhibits offered into evidence and hearing
23 argument, the court makes the following findings of fact and conclusions of law:

24 A. **FINDINGS OF FACT**

1 1. The Court heard testimony from Nathan Adams, a systems engineer at Forensic
2 Bioinformatics in Dayton, Ohio. Bioinformatics is a DNA consulting company founded by Dr.
3 Daniel Krane. Mr. Adams has a B.S. in Computer Science and is working towards obtaining his
4 M.S. in computer science.

5 2. Mr. Adams testified that source code is the human language that a computer can
6 understand and translate to machine language in order to execute its operations. TrueAllele software
7 contains 170,000 lines of code.

8 3. Mr. Adams testified that he had reviewed the source code of another probabilistic
9 genotyping system (PGS) called STRmix under a protective order and that because of that order, he
10 was unable to share any specific findings from his source code review.

11 4. Mr. Adams testified that his review of STRmix's source code occurred with
12 numerous precautions, in addition to the protective order, to insure that the code would not be stolen.
13 Mr. Adams was not allowed to bring any photographic, recording, or USB devices into the room
14 where the review occurred, the computer on which he reviewed the code was disconnected from the
15 internet, and that he was monitored at all times by an armed guard.

16 5. Mr. Adams testified that in 30 hours he was able to identify potential issues in
17 STRmix's source code that negatively affected the functioning of the software that could not have
18 been learned from any other source. However, due to the protective order, Mr. Adams could not
19 disclose what those potential issues were.

20 6. Mr. Adams testified that there are three levels of source code review. First, a
21 dedicated software firm could be hired to review the code for possible errors. This would cost
22 hundreds of thousands of dollars. A mid-range review involving a 200 hour review of the code
23 would cost approximately \$40,000 at \$200 per hour. This would take several months. Lastly, a brief
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20 hour review could provide insight into the general practices and standards of the code but would not allow a thorough investigation of all the models of molecular behavior.

7. The Court heard testimony about a number of different PGS products. Many PGS are open source, meaning the source code of the software can be reviewed by the public. PGS including TrueAllele, STRmix, and FST are proprietary and do not publish their source code. STRmix and FST have disclosed their source codes pursuant to court order. TrueAllele has not been ordered to disclose its source code¹.

8. Brian Ferguson is a lawyer with over twenty years' experience in intellectual property litigation. Mr. Ferguson is the co-chair of the Patent Litigation department at the law firm of Weil, Gotshal, and Manges, LLP, in Washington, D.C. Mr. Ferguson's work focuses on patent infringement cases involving disputes between companies regarding whether or not a particular patent has been violated.

9. Mr. Ferguson testified that source code is disclosed in intellectual property litigation because that is the only way for the particular functionality of the product to be assessed. If a dispute arises between smartphone companies over whether a particular function of a smartphone or tablet has been copied by a rival company, there is a need to determine how the software was programmed. That can only be done by reviewing the source code.

10. Mr. Ferguson testified that in intellectual property litigation, the parties retain a software engineering expert to review the source code with guidance from a subject matter expert. The subject matter expert will review the source code with the attorneys to identify the particular functionality in the patent that is key to determining whether or not an infringement has occurred. Then the source code expert will focus on reviewing that functionality in the source code.

¹ A California trial court did order Cybergenetics to disclose its source code but this order was later overturned on appeal. *People v. Superior Court (Chubbs)*, 2015 WL Reporter 139069.

1 11. The defense made an oral offer of proof to the Court that experts like Dr. Krane, Mr.
2 Adams, Dr. Lohmueller, or Dr. Balding could be used as subject matter experts should the Court
3 order TrueAllele's source code disclosed. Additionally, the defense made an oral offer of proof that
4 it had contacted a software engineer expert who was qualified and available to review the source
5 code itself.

6 12. Dr. Balding testified that he not understand how TrueAllele performs some of its
7 functions, including how it models drop out and drop in and that no publication or document
8 describes how TrueAllele accounts for drop-out. Dr. Balding further testified that he wrote the
9 original source code for LikeLTD but the current version was written by software engineers and he
10 hasn't reviewed it.

11 13. Dr. Lohmueller testified that TrueAllele's source code would be helpful in
12 understanding how TrueAllele behaves when it is modelling samples where there is the possibility of
13 drop-out. Dr. Loehmueller further testified that scientists can test data without the source code. The
14 source code is only one piece of the validation process. In fact, he has never looked at the source
15 code for his own PGS, Lab Retriever.

16 14. Dr. Krane testified that first and foremost he is a Biology professor and has no formal
17 degrees in math or statistics. He testified that he could not review TrueAllele's source code entirely
18 by himself. He would need at least a team of at least a dozen software engineers to do a
19 comprehensive review although even a 40 hour review might reveal something important. He
20 testified that the source code would be helpful to understand how the software deconvolutes
21 mixtures; distinguishes signal from noise when looking at peaks as low as 10/0 RFU; and identifies
22 peaks and peak heights, which TrueAllele does using a method different than any other PGS.
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1 15. Dr. Mark Perlin, founder of Cybergenetics, testified that his company has invested
2 millions of dollars over the last two decades to develop the TrueAllele software. The technology is
3 patented but the source code has never been revealed in any patent. Cybergenetics considers the
4 TrueAllele source code to be a trade secret. Dr. Perlin testified that disclosure of the TrueAllele
5 source code would allow competitors to copy the software and cause irreparable financial harm to
6 his company.

7 16. Dr. Perlin further testified that disclosure of the source code is not necessary to
8 validate the reliability of the program.

9 17. Jay Caponera, a forensic scientist with the New York State Police, testified that the
10 source code is not necessary to determine the reliability of TrueAllele because the code is not used in
11 validation. Reliability of software is determined by use of the validation metrics of sensitivity,
12 specificity, accuracy and reproducibility. He testified that he validated TrueAllele in 2011 without
13 access to the source code.

14 18. John Donahue is employed as the DNA Technical Leader at the Beaufort County
15 Sheriff's Office Forensic Services Laboratory in Beaufort, South Carolina. In his Declaration, he
16 testified that his lab has used TrueAllele for three years. They purchased the software in 2013 and
17 spent two years performing validation studies before implanting it into casework in January 2016.
18 He testified that the source code was not necessary to determine the reliability of TrueAllele because
19 in their validation studies they tested TrueAllele against known samples and known results and
20 obtained the expected results.

21 19. Thomas Hebert is employed as the DNA Technical Leader for the Baltimore City
22 Police Department. In his Declaration, Mr. Hebert testified that his lab has used TrueAllele for
23 casework since October 2015. In his opinion, the source code is not necessary to determine the
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1 reliability of software programs for forensic used. A proper validation requires testing samples with
2 known results. These results can then be compared to results generated by the program. A wide
3 variety of samples should be used to simulate real casework type samples to show the limits of the
4 software.

5 20. Kevin Miller is employed as the Forensic Scientist Leader at Hamilton Robotics. In
6 his Declaration, he testified that he assisted the Kern County Regional Crime Laboratory in
7 California in purchasing and validating TrueAllele for casework in 2014. He testified that DNA
8 analysts are not required to have the computer science or engineering backgrounds required to
9 review source code. Forensic analysts rely on instrumentation to perform a wide array of
10 mathematical calculations without requiring the analysts to check the calculations or know the
11 source code for the procedures.

12 21. Joanne Sgueglia was previously employed at the Massachusetts State Police Crime
13 Laboratory where TrueAllele was validated in 2011. In her Declaration, Ms. Sgueglia testified that
14 she has been involved in forensic DNA research and development/validation efforts for over 28
15 years. She testified that knowledge of the source code is not needed to validate TrueAllele. In the
16 field of forensics, labs evaluate and validate many systems by testing without specific knowledge of
17 the underlying mechanisms, programming, algorithms or chemistry.

18 22. Dr. Gary Shutler is employed as the DNA Technical Leader for the Washington State
19 Patrol Crime Laboratory (WSPCL). In his Declaration, Dr. Shutler testified that the WSPCL does
20 not currently have the funds to do probabilistic genotyping in their laboratory so it contracts with
21 Cybergenetics for interpretation of complex DNA mixtures. Dr. Shutler testified that the WSPCL
22 uses a variety of software technologies in their lab (such as GeneMapper and PopStats) and has
23 never found it necessary to review the source code to establish validation.

1 23. Dr. Susan Greenspoon is employed as a Molecular Biologist at the Virginia
2 Department of Forensic Science. In her April 4, 2016, letter, she wrote that the internal validation
3 study performed in her laboratory assessed TrueAllele's accuracy, reproducibility, sensitivity (ability
4 to detect minor contributors) and specificity (ability to eliminate non-contributors) without the need
5 for the source code.

6 24. The Scientific Working Group on DNA Analysis Methods (SWGDM) is a group of
7 approximately 50 scientists representing federal, state and local forensic DNA laboratories in the
8 United States and Canada. They meet twice a year and issue documents to provide direction and
9 guidance for the scientific community. The 2015 SWGDM Guidelines for the Validation of
10 Probabilistic Genotyping Systems do not require or even mention the need for a computer source
11 code for validation.

12 25. 34 validation studies of TrueAllele have been published. Seven have been published
13 in peer-reviewed journals. Ex 44. None of the validation studies included a review of the source
14 code.

15 26. Cybergenetics provided the defense with a case report and case packet containing 4
16 GB of information detailing the testing done in this case. Additionally, Cybergenetics provides
17 defense experts with a 96-day license to use TrueAllele in a read-only viewer and the ability to test
18 their own mixtures using their own data on the TrueAllele on the Cloud at no charge.

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21 **B. CONCLUSIONS OF LAW**
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1 1. The discovery which the defense seeks is not in the State's possession. Dr. Perlin
2 advised the State that Cybergenetics considers the TrueAllele source code to be a trade secret and
3 would not be providing it. CrR 4.7(d).

4 2. The Court can order the disclosure of materials outside of the required disclosures
5 under CrR 4.7(a), (c), (d), if the information sought is material and the discovery request is
6 reasonable. CrR 4.7(e)(1), *State v. Norby*, 122 Wn.2d 258 (1993).

7 3. The court can condition or deny disclosure if it finds that there is a substantial risk of
8 harm or unnecessary annoyance resulting from such disclosure which outweighs the usefulness of
9 any disclosure to the defendant. CrR 4.7(e)(2).

10 4. Materiality requires that the defendant "make a particularized factual showing that
11 information useful to the defense is likely to be found in the records." *State v. Diemel*, 81 Wn.App.
12 464, 469 (1996).

13 5. The Defense has not articulated with particularity what material information, if any,
14 could be found by reviewing the source code. As several experts who work in the field of forensic
15 DNA testing have testified, an examination of the source code is not necessary in order to determine
16 the reliability of TrueAllele and validate it for casework.

17 6. This is not a situation where production of the source code is necessary so that a
18 particular functionality of the software can be examined to see if a patent infringement has occurred.

19 7. TrueAllele has been validated for use in casework by laboratories in California,
20 Louisiana, Maryland, New York, Ohio, Pennsylvania, South Carolina, Virginia, Northern Ireland
21 and Australia without having access to the source code.

22 8. The Defense has failed to meet its burden to show that disclosure of the source code
23 is material and reasonable. Based upon the factual findings set forth above, this Court is not
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1 persuaded that a review of the source code is necessary in order to determine whether TrueAllele is
2 reliable. The defense demand for the source code is not material or reasonable because the
3 testimony in this case from both state and defense experts establishes that scientists can confirm the
4 reliability of Trueallele without access to the source code. This testimony is consistent with the
5 holding of other courts that have addressed this same issue. *State v. Wakefield*, 47 Misc. 3d 850,
6 854, 9 N.Y.S.3d 540, 543 (N.Y. Sup. Ct. 2015) (“scientists can, and have, validated the reliability of
7 Cybergenetics TrueAllele Casework even though the source code underlying the process is not
8 available to the public.”); *Com. v. Foley*, 38 A.3d 882, 889 (Penn. Sup. Ct. 2012) (“scientists can
9 validate the reliability of a computerized process even if the ‘source code’ underlying that process is
10 not available to the public.”).

11 9. Further, the usefulness of disclosing the source code is outweighed by a substantial
12 risk of financial harm to Cybergenetics. Scientists can confirm the reliability of Trueallele without
13 access to the source code. Dr. Perlin and Cybergenetics have a legitimate interest in keeping the
14 source code, a trade secret, confidential.

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16 **C. ORDER**

17 For the reasons stated above, the defendant’s motion to compel the disclosure of TrueAllele’s
18 source code is DENIED.

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20 Signed this _____ day of January, 2017.

21
22 _____ e-filed _____
23 THE HONORABLE MARIANE SPEARMAN

King County Superior Court
Judicial Electronic Signature Page

Case Number: 10-1-09274-5
Case Title: STATE OF WASHINGTON VS FAIR, EMANUEL DEMELVIN
AKA
Document Title: ORDER

Signed by: Mariane Spearman
Date: 1/12/2017 2:06:07 PM



Judge/Commissioner: Mariane Spearman

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