IN THE COURT OF APPEALS FOR THE SOUTHERN DISTRICT OF MISSOURI
STATE OF MISSOURI

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| STATE OF MISSOURI, | ) | |
| | ) | |
| Appellee, | ) | |
| | ) | |
| v. | ) | SD39099 |
| | ) | |
| LANCE C. SHOCKLEY, | ) | |
| | ) | |
| Appellant. | ) | |

## AFFIDAVIT OF DR. MARK W. PERLIN

I, the undersigned individual, being duly sworn and under oath, depose and state as follows:

My name is Mark Perlin and I am over twenty-one years of age, of sound mind and body, and am capable of making the statements contained in this Affidavit as I have personal knowledge of the matters set forth herein:

### Introductory statement

On August 22, 2025, Theodore (TC) Tanski of the Federal Public Defender's Office in Columbus, Ohio told me about the recent denial of Lance Shockley's *Motion for Postconviction DNA Testing*, the reasons underlying Judge Proctor's July ruling, and Mr. Shockley's imminent October execution.

I have considerable expertise in computer interpretation of complex DNA evidence. Twenty-five years ago, I invented the widely adopted "continuous" probabilistic genotyping (PG) method of DNA mixture interpretation now used by the FBI. Fifteen years ago, I was the first

scientific expert witness to ever introduce such PG DNA evidence into a court of law.

Based on this expertise, I believe I can assist the Court in understanding why (I) there is a reasonable probability that DNA evidence of another person could have reasonably changed the trial outcome, and (II) effective touch DNA analysis was not reasonably available at the time of trial in March of 2009.

## Expert qualifications

I hold degrees in Chemistry (BA), Mathematics (PhD), Medicine (MD) and Computer Science (PhD). I was senior research faculty in Computer Science at Carnegie Mellon University. I have led successful and novel bioinformation automation projects, such as building the first DNA contig map of human chromosome 11 at a hundredth of the cost of competing groups. I founded Cybergenetics (Pittsburgh, PA) in 1994 to commercialize my bioinformation inventions.

In 2000, I invented "continuous" PG, the gold standard for calculating accurate DNA match statistics (i.e., the "likelihood ratio", or "LR") by making full use of all the quantitative STR data. I developed the TrueAllele® technology, the first computer system to solve DNA evidence having small amounts of DNA, or mixtures containing many contributors. TrueAllele uses

probability and computers to unmix mixture data into the genotypes of each contributor. Comparing genotypes produces LR match statistics.

In 2005, TrueAllele reanalyzed the World Trade Center DNA data to identify victim remains. After a *Frye* hearing, in March 2009 I testified for the prosecution about TrueAllele results in the Pennsylvania murder trial of state trooper Kevin Foley. *See* Exhibit C. This trial introduced accurate LR mixture results into criminal justice, demonstrating the computer's tremendous improvement over prevalent manual DNA mixture interpretation methods.

Over 40 TrueAllele validation studies have been conducted, 8 of them published in peer-reviewed journals. The DNA interpretation system has withstood 48 American admissibility challenges. TrueAllele is purchased and used by crime laboratories. Cybergenetics has assisted both prosecution and defense in over 1,400 cases across 48 states for over 570 agencies. We have exonerated at least 15 innocent men. I have testified in court about 100 times.

My Curriculum Vitae is attached as Exhibit A. Also attached is a Declaration I wrote describing the scientific reliability and judicial acceptance of Cybergenetics' TrueAllele technology for accurate computer interpretation of complex DNA evidence. Exhibit B.

**I. Once reliable DNA evidence enters a courtroom, one cannot predict what a jury will decide. The physical evidence can completely change a case outcome.**

New DNA evidence can completely change a case and its outcome. Cybergenetics' TrueAllele interpretation service has done this hundreds of times. Our accurate and objective computer modeling revives a crime lab's weak, "inconclusive", or "uninterpretable" DNA results to provide a far more complete and reliable data analysis.

For prosecutors, this means inculpatory physical evidence that can place a defendant at a crime scene. For defendants, this means exculpatory physical evidence can show their DNA wasn't at the scene, or that someone else's DNA was there. Indeed, most cases where we testify about our DNA findings significantly impact the trier of fact's considerations.

The following examples illustrate how TrueAllele analysis can reveal new information which was not available at the time of Shockley's trial.

*Commonwealth of Pennsylvania v. Joshua Huber*

In this double murder, an Allegheny County prosecutor asked Cybergenetics to examine DNA evidence data. The local crime lab had been unable to draw conclusions from complex DNA mixtures. On the same lab data, TrueAllele placed defendant Joshua Huber and the victims on various items. *See* Exhibit D. The prosecutor turned our results over to the defense.

The defense lawyers saw how the new DNA information could support their theory of a struggle and self-defense, rather than premeditated murder. They retained Cybergenetics, and I testified at trial. Both sides presented their case using the TrueAllele analysis. The jury acquitted Huber of first-degree homicide.

*State of Texas v. Lydell Grant*

Lydell Grant was convicted and sentenced to life in prison for the murder of Aaron Scheerhoorn based on faulty but persuasive DNA evidence. Seven years later, TrueAllele scientific analysis of the same fingernail data excluded Grant. And developed a DNA profile for a likely suspect. *See* Exhibit E.

The TrueAllele profile was run through CODIS. The database search identified Jermarico Carter, who was living in Georgia. When confronted by the Houston police, Carter confessed. Grant was later released from prison and fully exonerated.

*State of Indiana v. Darryl Pinkins and Roosevelt Glenn*

Darryl Pinkins and Roosevelt Glenn were convicted in a five-assailant gang rape based on faulty forensic evidence. *See* Exhibit F. Between them, they would serve 40 years in prison for a crime they did not commit. The post-conviction court wanted DNA evidence that showed the two men were

not there, but that five unknown people were. Traditional DNA mixture analysis could not do this.

Working *pro bono*, Cybergenetics reanalyzed the same jacket and sweater semen stain DNA data. The new and more informative TrueAllele results satisfied the court's requirements. Pinkins was released from prison, and both men were fully exonerated by the newly discovered DNA evidence.

## II. Effective touch DNA analysis was not reasonably available to Shockley at the time of trial.

Touch DNA is biological evidence that has small amounts of DNA, or DNA mixtures of two or more people. In 2009, traditional methods of interpreting small amounts or mixed DNA were largely uninformative. The available interpretation methods either gave an incorrect match statistic, or no answer at all. And the methods were unable to statistically exclude suspects.

DNA testing has two parts, (i) laboratory data generation, and (ii) **subsequent interpretation** of the data.

The STR laboratory experiment is only the first half of the analysis process. After STR data is generated, it must then be accurately interpreted. No matter how good the STR data, a failed interpretation method will not generate useful DNA match information. *See* Exhibit G.

**Effective interpretation** of touch DNA data was not reasonably available in 2009.

Traditional STR data interpretation is *qualitative*. It applies data thresholds to discard quantitative information; it doesn't consider alternative explanations. It was well-known at the time of trial that available STR interpretation failed to accurately solve touch DNA. *See* Exhibit H.

In 2009, Cybergenetics' TrueAllele® technology was **the only effective** touch DNA STR data interpretation method.

The only effective way to solve touch DNA STR data is to use all the *quantitative* data. To do this, a validated probability model is needed to accurately characterize the STR laboratory process. In 2009, the only such validated probability model was Cybergenetics' continuous PG TrueAllele technology. *See* Exhibit I.

TrueAllele **was first used in court** for DNA data interpretation in **March 2009** in the *Pennsylvania v. Kevin Foley* murder trial.

In 2009, Cybergenetics did not offer or market TrueAllele services. For its first use in trial, Cybergenetics had directly contacted the Pennsylvania Attorney General office, and explained how its newly validated TrueAllele technology might assist them with DNA mixture evidence.

In February 2009, TrueAllele was admitted as reliable evidence after a *Frye* hearing. I testified at trial in March 2009. That was the first time any continuous PG method had ever been used in a court of law, anywhere in the world. Foley was convicted on March 18, 2009.

TrueAllele DNA data interpretation was not used again in American courts for two years until June **2011**, in the *Pennsylvania v. Glenn Lyons* murder trial.

In 2009, Cybergenetics' primary forensic DNA business was providing TrueAllele computer systems to government crime laboratories. Cybergenetics was not generally marketing or providing expert witness services at that time.

Through Pennsylvania prosecution word of mouth, a Berks County prosecutor requested TrueAllele consulting services for DNA evidence in the *Lyons* case. I testified in that case in June 2011. This was only the second American trial with TrueAllele testimony.

Before 2011, Cybergenetics had provided TrueAllele services solely to police and prosecution. We first assisted the defense in February 2011, testifying at a 2012 Butler County pre-trial DNA hearing in Pennsylvania.

TrueAllele was **first presented in Missouri** court in November **2017** at a discovery request hearing in *Missouri v. Reginald Clemons*.

Cybergenetics was first contacted by a Missouri agency for TrueAllele services in July 2014. The agency was the Missouri State Highway Patrol Crime Laboratory. On the provided fingernail evidence STR data, TrueAllele separated the DNA mixture, finding match results of trillions and quintillions to the two references.

I testified about TrueAllele for the first time in Missouri in November 2017. The St. Louis hearing was related to computer source code discovery in the 1991 Chain of Rocks Bridge double rape and murder. Cybergenetics was retained by the prosecution. *See* Exhibit J.

Since Cybergenetics had not started widely marketing its TrueAllele casework services until after 2009, testing **was not reasonably available** to Shockley at the time of his 2009 trial.

Cybergenetics first testified about TrueAllele in the March 2009 *Foley* trial. In December of that year, after Shockley's trial, the first peer-reviewed TrueAllele validation paper on DNA mixtures was published. *See* Exhibit I. Cybergenetics had not yet started advertising or marketing its TrueAllele casework services. TrueAllele was not reasonably available to Shockley.

In 2009, no other DNA interpretation software could accurately solve STR mixtures or low-level samples. That is, at the time of trial, no effective non-TrueAllele interpretation method was reasonably available to Shockley.

Since no effective touch DNA interpretation method for STR data was available for defendants in 2009, whether with or without TrueAllele, accurate DNA analysis was not reasonably available to Shockley.

## Conclusion

As a scientist, I believe that DNA evidence should not be denied before the State takes a man's life. In January 2020, I flew across the Atlantic Ocean to testify in a Georgia courtroom. I saw the untested murder handgun in the evidence room. I explained to the court how TrueAllele had successfully resolved hundreds of touch DNA handgun mixtures, but such technology was unavailable to Jimmy Meders in 1989. The court demurred, and Meders was denied DNA testing. Days later, hours before his execution, the State commuted his sentence from death to life. *See* Exhibit K.

Shockley has not had the benefit of potentially exculpatory DNA evidence. While STR testing existed in 2009 to *generate* informative data, the accurate *interpretation* of touch DNA data was not available to him at that time. Indeed, the ability of TrueAllele to interpret low-level touch DNA mixtures in a 2011 Northern Ireland terrorist double homicide was novel and newsworthy forensic evidence, admitted only after opposition challenge. And produced the key physical evidence leading to a conviction in the Real IRA Massereene terrorist attack. *See* Exhibit L.

The Court's July 2025 Ruling describes Shockley's "Databank Theory" and "Confession Theory" as "mere hope and speculation." However, that exact scenario occurred in combination in *Texas v. Lydell Grant*, leading to Grant's TrueAllele post-conviction exoneration. I have seen the "Redundancy Theory" become persuasive evidence for both prosecution and defense. In my experience, there is a reasonable probability that Shockley "would not have been convicted if exculpatory results had been obtained through the requested DNA testing."

STR data are unbiased. TrueAllele analysis of touch DNA data is informative, accurate and objective. The DNA testing and TrueAllele reporting can be completed in a month or so. The DNA match statistic results should be made available to the Post-Conviction Court, and disclosed to both prosecution and defense. Modern science can help determine what is true. And courts can then weigh that truth to decide justice.

EXHIBITS

(In order of appearance)

A.Perlin Curriculum Vitae (current)
B. Perlin Declaration (current)
C. PA v. Foley Book Chapter (2013)
D. PA v. Huber trial page (2017)
E. TX v. Grant IPT page (2021)
F. IN v. Pinkins & Glenn Forensic® article (2021)
G. JPI Inclusion Article (2015)
H. Champion Magazine CPI Article (2018)
I TrueAllele Validation PLoS ONE (December 2009)
J. MO v. Clemons news (2017)

K. GA v. Jimmy Meders CYB webpage (2020)
L. Massereene magazine article (2012)

**SIGNATURE**

9-19-2025

Mark W Perlin
Chief Scientist and Executive
Cybergenetics, Pittsburgh, PA

Date

STATE OF PENNSYLVANIA )
)
COUNTY OF ALLEGHENY )

Subscribed and sworn to before me this 19 day of September, 2025.

Commonwealth of Pennsylvania - Notary Seal
GENEVA MARIE TAYLOR - Notary Public
Allegheny County
My Commission Expires October 21, 2026
Commission Number 1427808

Geneva Marie Taylor
Notary Public

My Commission Expires:

October 21, 2026