Cybergenetics

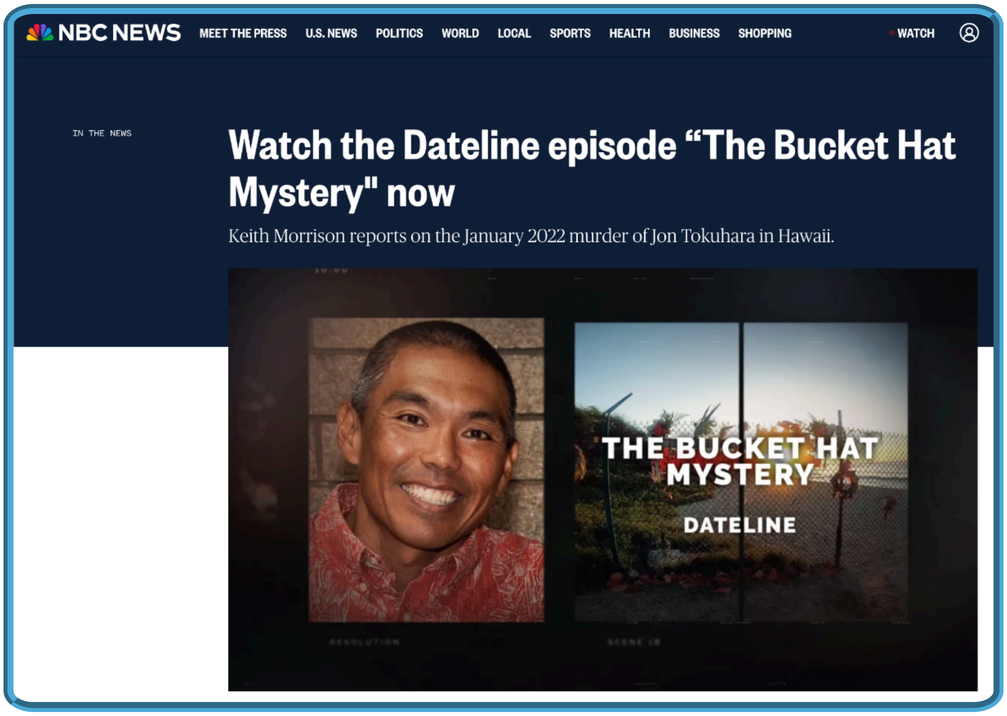
Fall Newsletter

Better Justice Through Better Science ™

Newsflash

Cybergenetics News

Dateline DNA: The Bucket Hat Mystery



Watch the Dateline episode “The Bucket Hat Mystery" now

Keith Morrison reports on the January 2022 murder of Jon Tokuhara in Hawaii.

Our last newsletter ran a story on "Honolulu homicide - Love, lies, and little DNA," about "unsolvable" DNA on a Quicksilver bucket hat. TrueAllele solved the DNA mixture and overcame a defense *Daubert* challenge. The 16.4 trillion match statistic helped convict the defendant of murder.

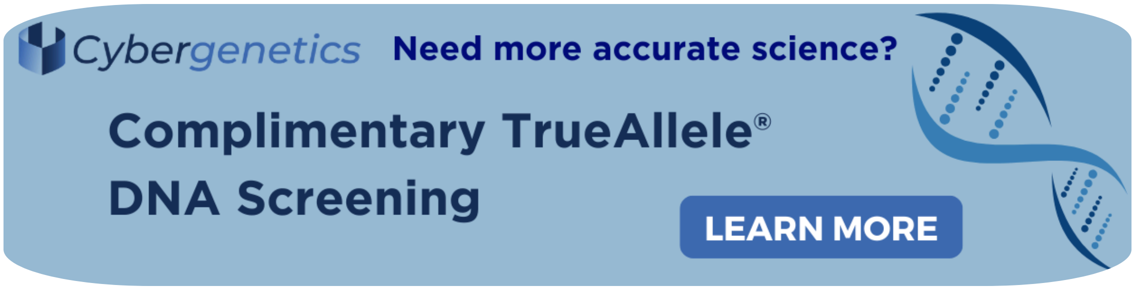
On October 8, NBC Dateline aired "The Bucket Hat Mystery". The episode showed Cybergenetics Casework Manager Jennifer Bracamontes testifying at trial about her TrueAllele results.

Dateline DNA

DNA Innovation in Science and Law

Continual innovation keeps Cybergenetics at the forefront of science and law. Crime laboratories and criminal justice send us cases when complex DNA evidence demands more powerful math and computer interpretation. Living at the leading edge, we are often the first to see new trends in science and law.

In September alone, we assisted courts with three new forensic challenges. We prepared thoughtful responses and wrote expert reports. Our scientific testimony was driven by data and offered easy metaphors. The case highlights below share some of what we learned.



Recent Presentations

Promega 2025 ISHI Conference Talk

On November 5, Cybergenetics forensic analyst Kari Danser spoke at *Promega's Thirty Sixth International Symposium on Human Identification* in West Palm Beach, Florida. The topic was "Unmixing the mixture with Next Generation Sequencing."

Her talk revisited Ohio v. Slater Howell, described in our Summer Newsletter. Cybergenetics interpreted the seven-person capillary electrophoresis (CE) DNA mixture evidence using advanced TrueAllele® probabilistic genotyping (PG) technology, linking Slater Howell to the crime.

What if newer Next Generation Sequencing (NGS) had been used to generate the DNA mixture data, instead of older CE detection? NGS generates high-resolution massively-parallel DNA data from degraded, mixed, or low-level DNA evidence.

The ISHI presentation substituted NGS mixture validation data for the case's original CE data. The talk showed how TrueAllele was able to resolve the seven-person NGS mixture. Pairing TrueAllele with NGS data easily solves very complex DNA mixtures.

ISHI Talk

Duquesne University Symposium Talk

On October 17-18, Duquesne University's Wecht Institute of Forensic Science and Law held its *24th Annual Symposium*. Dr. Mark Perlin spoke to a general audience of doctors and lawyers for 37 minutes about "How Courts Understand DNA Evidence."

Dr. Perlin's talk considered how well courts understand the DNA truth that forensic science can reveal. And exposed flawed opposition arguments developed to undermine that truth.

How is measuring information different than counting tests? What is a reasonable amount of scientific validation? Why should the state test DNA before taking a man's life? These questions arose in three September cases. And are answered in the presentation and the case highlights below.

Duquesne Talk

Case Highlights

Missouri v. Shockley:

The Executioner's Dilemma

On October 14, the State of Missouri was set to execute Lance Shockley by lethal injection. The circumstantial evidence of his crime was compelling, but comprehensive DNA testing wasn't done—and the courts decided that it never would be.

What does it mean to deny DNA that can prove innocence—or confirm guilt? Why would courts deny science in their administration of justice? Can a loud public and forensic outcry alter a condemned man's fate?

On October 8, *Forensic® Magazine* explored these issues in a widely-read "Lance Shockley Set to Die" article. In his *DNA Matters* column, Cybergenetics Chief Scientist Dr. Mark Perlin explained the forensic facts, and fully refuted the court's reasons for denying Shockley DNA testing.

Dr. Perlin and other scientists filed four separate *amicus curiae* briefs urging the courts to consider the science. But under Missouri law judges are free to ignore these filings. Which they did. Lance Shockley died by lethal injection at 6:13 pm on October 14.

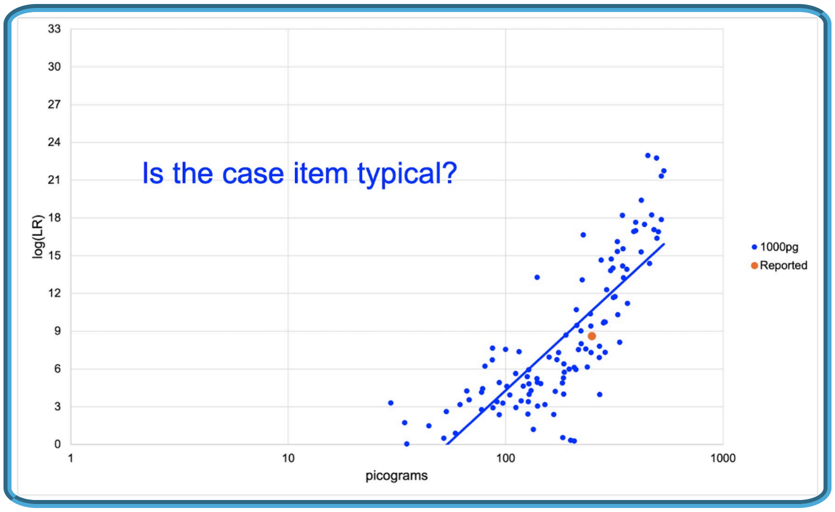
Shockley Article

Maryland v. Williams: Factor Space Argument

DNA was found under the fingernails of a 2020 fatal stabbing Baltimore City victim. The crime laboratory used their in-house TrueAllele system to separate the DNA mixture into three genotypes. One of those genotypes found a connection to Darius Williams with a likelihood ratio (LR) of 400 million.

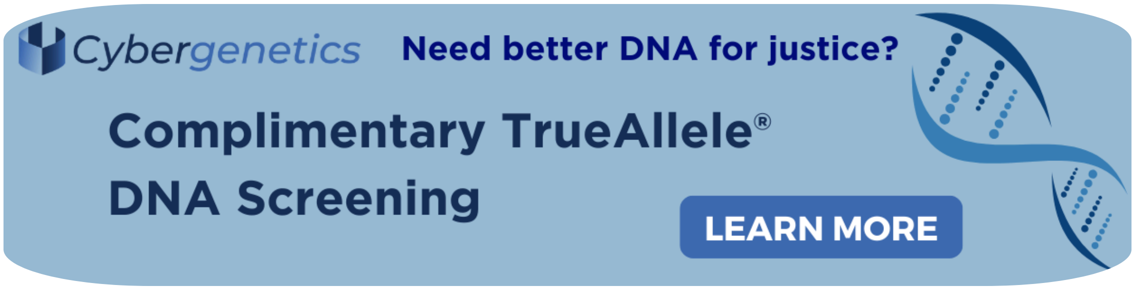
The defense challenged the lab's TrueAllele reliability in a pretrial *Daubert* hearing. They used a 2024 report from National Institute of Standards and Technology (NIST) in the US Department of Commerce. Defying scientific practice and forensic DNA standards, NIST had proposed a specious "factor space" approach to validating PG software. The defense embraced NIST's impractical idea.

There are many validation axes. These include the accuracy, sensitivity, specificity, and reproducibility of different data and parameters. In normal science, each axis is tested separately, with the total number of tests *adding up* to hundreds of representative experiments. But "factor space" would instead test all axes together, *multiplying* axes to form billions of experiments – an impossible task.



Cybergenetics Chief Scientist Dr. Mark Perlin testified at the September hearing. He explained why TrueAllele is scientifically validated (in over 40 studies) and legally accepted (after 50 challenges). He showed how in 2021 he and 18 other scientists had criticized NIST's ludicrous "factor space." And why the Baltimore lab's TrueAllele match statistic (central orange dot) for Williams was "boringly" typical, relative to over 100 similar LR results (blue dot scatterplot) in the lab's validation. The judge admitted TrueAllele as reliable.

NIST Response

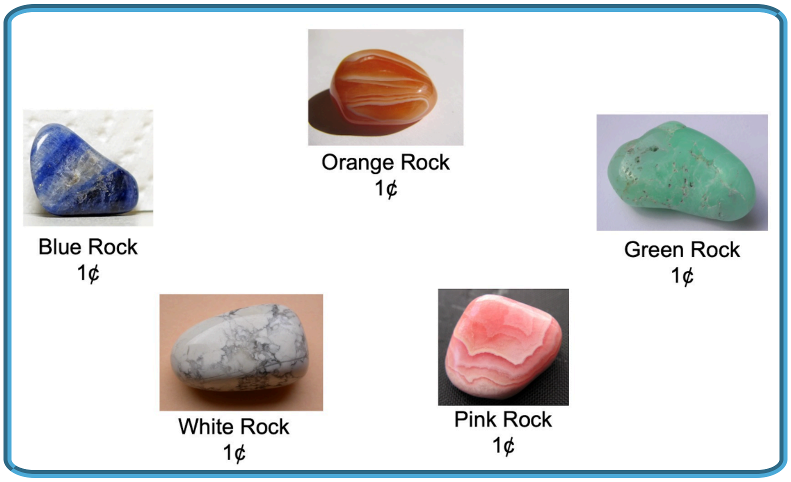


Pennsylvania v. Skundrich: Better Science Explained

In 2002, a Pittsburgh woman was raped by a stranger who left his DNA on her clothing. After a CODIS hit, in 2011 the Allegheny County Crime laboratory generated data from the DNA mixture and reported a Combined Probability of Inclusion (CPI) match statistic to Ralph Skundrich in the hundreds of thousands (5 zeros after the one). Two years later, on the same DNA mixture data, Cybergenetics's TrueAllele gave a match statistic in the quadrillions (15 zeros).

After his 2014 trial, Skundrich was convicted and sentenced to 75-150 years in prison. His post-conviction appeal was denied. But the appellate court reversed, with concerns about the large DNA match statistic disparity. How could TrueAllele's result be 10 orders of magnitude (ten billion times) larger than the county lab's CPI? How is that possible?

Science answers this easily. TrueAllele *measures* the amount of identification information in the DNA tests. But CPI just *counts* the number of tests reported. *Measuring* is different from *counting*. One can *count* five stones, whether worthless rocks or large diamonds. But diamonds can be worth billions.



Courts care about DNA match statistic reliability. That's why 50 of them have accepted TrueAllele as reliable, based on dozens of validation studies. But now judges should worry about unproven CPI's incorrect answers in tens of thousands of past DNA cases. It's time to open up the past and revisit all the old CPI injustice.

CPI Article

Upcoming Presentations

AAFS 2026 Presentations

Cybergenetics will be presenting unique TrueAllele technology innovations in three talks at the upcoming *American Academy of Forensic Sciences Annual Scientific Conference* in New Orleans, Louisiana in February 2026.

Cybergenetics

Our pioneering work on DNA database automation delivers powerful probabilistic genotype matching to criminal investigators, providing affordable volume crime solutions. We will be presenting with collaborating investigators on "Turning unsearchable mixtures into actionable intelligence for reliable DNA evidence."

Actionable Intelligence

RapidHIT genotyping puts the power of fast DNA evidence into the hands of police and crime labs. But this fast and informative technology isn't widely used for DNA mixtures. We will be presenting validation results with crime laboratory collaborators on the "Computer interpretation of RapidHIT mixtures for DNA match information."

RapidHIT Mixtures

In forensic science, NGS has long been "the technology of the future." Cybergenetics makes this futuristic machinery available for immediate use today. We will present how combining advanced TrueAllele interpretation with high-resolution NGS data enables "Solving complex DNA mixtures with Next Generation Sequencing."

TrueAllele NGS

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