

Cybergenetics Newsletter February 2022

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The Queen v. Robert Xie – Science Solves a Family Mass Murder

On the night of 18 July 2009, in a Sydney Australia suburb, five Lin family members were bludgeoned to death in their North Epping home. Suspicion fell on the murdered wife's brother-in-law, Robert Xie. The suspect had cleaned his garage floor that very morning.

Police examined stains from Xie's garage floor. In stain 91, they found a DNA mixture of five people. Cybergenetics' TrueAllele analysis of the DNA stain provided the crucial link between Xie and the crime scene. No other software technology could make this forensic connection.

TrueAllele analyzed the DNA mixture data that the crime lab generated from the stain. The computer peeled away each genotype layer from the data. Cybergenetics Dr. Mark Perlin [testified in Sydney court](#) about the likelihood ratios that linked the victims' DNA to the suspect.

The key forensic questions, and how TrueAllele solved them, form the case example of a scientific talk. Dr. Perlin and others will be presenting their findings in this case on Friday at the American Academy of Forensic Sciences (AAFS) conference in Seattle, as described next.

Peeling Away Uncertainty: A Probabilistic Approach to DNA Mixture Deconvolution

How do you [solve a ten-person DNA mixture](#)? Use TrueAllele, of course. But what do you ask the Cybergenetics computer to do with so many contributors? The answer is "genotype conditioning" (*aka* "peeling") – simplify the data analysis problem step-by-step.

In this [AAFS talk](#), to be given on Friday morning at 10:15 am (Pacific time), Cybergenetics CEO Dr. Mark Perlin and George Mason University Professor Mark Wilson's student Hajara Chaudhry will show how to peel away genotype uncertainty from complex DNA mixtures.

Dr. Perlin will explain how the TrueAllele peeling method works. Chaudhry will then present empirical data from her Masters Thesis, demonstrating the method's efficacy on DNA mixtures. Dr. Perlin will conclude with the Queen v. Xie homicide, showing how peeling is used in forensic casework.

Automated Familial Search Using a Probabilistic Genotype Database

You have DNA evidence from the crime scene. But a database search doesn't find a suspect. Then what? Familial searching can find a suspect through their relatives who *are* on the database. Even better, a TrueAllele database can conduct this DNA search automatically.

In this [AAFS talk](#), to be given on Friday morning at 11:00 am (Pacific time), Cybergenetics CEO Dr. Mark Perlin and TrueAllele instructor Matthew Legler will show how smart computers can automatically and continuously conduct familial searching in a cost-effective labor-free way.

Dr. Perlin will explain familial searching and TrueAllele database automation. Probabilistic genotypes preserve DNA match information far better than CODIS. Legler will then describe three familial search validation studies conducted by the Kern Regional Crime Laboratory (Bakersfield, CA) using their Cybergenetics database. A case example will tie it all together.

Making Something Out of Nothing: The Inconclusive Fallacy

Doesn't zero amount to nothing? Isn't zero information meaningless? Yes, of course! But in the false logic of a clever lawyer, the absence of DNA match information can be twisted to sound incriminating. With the "Inconclusive Fallacy," a litigator can suggest guilt using non-probative "forensic evidence" that isn't real science.

In this [AAFS talk](#), to be given on Friday afternoon at 4:45 pm (Pacific time), Cybergenetics CEO Dr. Mark Perlin and Santa Clara Deputy Public Defender Kelley Kulick will show how unscientific logic can make something out of nothing, creating fake incriminating "evidence."

Dr. Perlin and DPD Kulick will jointly present the material. They will show how some lawyers argue that "inconclusive" DNA evidence means the defendant is

included in the DNA evidence – and why this logic is fallacious, wrong, and dangerous. They will introduce the "Inconclusive Fallacy," and show how to counter it in court. Cases and ethics will be discussed.

Cybergenetics Forensic Milestones

In 2021, Cybergenetics hit some major casework milestones. The company has now reviewed over a thousand cases, from both sides of the criminal justice system. The firm's forensic analysts have testified in over a hundred trials. Unlike other methods, the objective and accurate TrueAllele approach is a neutral way to find truth in DNA evidence.

There were six more successful TrueAllele [admissibility hearings](#) last year (in Georgia, Maryland, Tennessee, and federal court). There were two more appellate affirmations (in Florida and Tennessee). Since 2009, our technology has withstood over thirty Frye and Daubert challenges.



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