Pittsburgh tool helps shed light on incest crimes

Local firm’s DNA analysis sees results

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By David Templeton, Pittsburgh Post-Gazette

With a crime full of secrets, prosecutors long have faced challenges in incest cases, especially when the sole testimony comes from a child.

The scared victim, dealing with psychological and physical damage from abuse, may be embarrassed, feel guilt, and fear his or her story won’t be believed or will break up the family.

Even when there is physical evidence, such as a fluid or stain sample, genetic similarities in family DNA have typically made it difficult to confirm whose DNA was represented in the sample.

But now a forensic tool developed by a company in Oakland is making it more possible to distinguish family members’ individual profiles in such a sample through DNA analysis.

TrueAllele Casework, a DNA interpretation system developed by Cybergnetics Corp., is not new, but has only recently been used in incest cases, said Mark W. Perlin, founder of the company.

A conviction in December in Allegheny County in a case in which the technology developed by Dr. Perlin was used for DNA analysis resulted in a lengthy jail term for the father, while a New York case concluded May 22 with a plea agreement.

“It strengthens cases where the prosecutions do move forward,” said Kevin W.P. Miller, director of the Kern Regional Crime Laboratory in Bakersfield, Calif. “The prosecutor does not hang his hat solely on DNA. You have to consider all the facts of the case. But I can tell you that the most notable cases we’ve tried with TrueAllele, the DNA was the case. And in cases where we did move forward, we’ve prevailed.”

DNA-based conviction

In the Allegheny County case, a father was arrested in May 2014 on charges he sexually abused his daughter for six years.

Dr. Perlin testified that computer analysis of DNA mixtures involving semen found on the girl’s bra and father’s T-shirt produced a match statistic for the daughter representing a probability of 1 in 943 quadrillion that it was someone other than her. The same stain had a match statistic for the father showing a 1 in 2.78 quintillion chance it was someone other than he.

The 37-year-old father was convicted and sentenced in December to serve 40 to 80 years in prison. The Post-Gazette does not publish names in such cases to protect the victim’s identity.

Allegheny County District Attorney Stephen A. Zappala called the technology “revolutionary.”

“It convicts the guilty and exonerates those not responsible for the crime.”
New York case

In a case in Westchester County, N.Y., a father was accused of sexually abusing his daughter after he got custody because the mother had drug addiction problems.

Lucian Chalfen, spokesman for the Westchester County district attorney’s office, said the father was arrested there after analysis of DNA mixtures taken from multiple semen stains recovered from a heavily soiled comforter linked him to the crimes. It became the key evidence.

The analysis indicated a match statistic on those stains as high as 705 quadrillion times more probable than coincidence that it was the father, with a match statistic of 216 quadrillion times more probable than coincidence for the daughter.

Facing that evidence, the father pleaded guilty in May 2014 in Westchester to third-degree rape, which Mr. Chalfen said led to a three-year prison sentence. In March he pleaded guilty to a first-degree felony charge in the Bronx involving the same daughter, and on May 22 was sentenced to five years in prison, which he must serve consecutively to the Westchester sentence.

How it works

Dr. Perlin’s system is based on computer analysis of genetic data. A person’s genetic type, or genotype, is composed of pairs of alleles — one allele in the pair inherited from each parent — and located on chromosomes. Forensic scientists gather allele data at many chromosomal locations.

Closely related people have genotypes with alleles that overlap, making it difficult to separate out genotypes of individuals in a mixed sample. Dr. Perlin’s system, however, uses computer analyses that take into account the amount of alleles in the data in order to separate individual genotypes. The computer can consider many thousands of genotype possibilities and their combinations in order to explain the allele data at all locations.

This process produces genotypes and their probabilities at every genetic location for each of the individuals who contributed their DNA to the mixture. The genotype separation is done without using any data on the suspect or victim to ensure that the process is objective.

Following genotype separation, a comparison can be made with known genotypes of the suspect and victim in order to calculate a DNA match statistic. A statistic that shows that a match is a million times more probable than coincidence is a highly confident result.

Few cases with evidence

Incest is not a common crime, and experts say underreporting makes the numbers even smaller. Father-child sexual abuse involves less than 1 percent of all cases of sexual abuse of children.
The nature of such a family crime means physical evidence is often not available.

“The problem usually is when the disclosure happens, when a kid tells a friend or the kid tells a teacher,” said David Finkelhor, a sociology professor at the University of New Hampshire and director of the Crimes Against Children Research Center. “It’s not like a rape situation where the victim shows up at an emergency room, and they take a swab of semen. Typically the last contact occurred within several days, so there isn’t any good evidence to pick up in that way.”

For that reason, he said, TrueAllele “may be useful in some instances” but isn’t a game changer.

“In most of the medical and forensic evaluations, only in 20 percent of the cases is there any medical evidence and more frequently some damage to genital anatomy,” said Mr. Finkelhor, a Point Breeze native. “The father is around the house and his DNA is everywhere, unless the semen is on the kid. Even if it is on the bed, the dad can say, 'Yes, but nothing happened there with the child.’”

But in cases where there is physical evidence, the technology can make a difference.

“By and large, it has enabled us to resolve mixtures that couldn’t be resolved previously and gives law enforcement answers in very tough cases,” said Mr. Miller of the Kern Regional Crime Laboratory.

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