

ARIZONA SUPERIOR COURT, PIMA COUNTY

JUDGE PRO TEMPORE: HON. HOWARD FELL

COURT REPORTER: NONE

STATE OF ARIZONA

VS.

EDWARD JOHN SANDERS

FILED
PATRICIA A. NOLAND
CLERK, SUPERIOR COURT
December 16, 2003 (10:54 a.m.)
By: R. Munyon / cg

CASE NO. C R - 2000 2900

DATE: December 16, 2003

MINUTE ENTRY

UNDER ADVISEMENT RULING ON DNA ISSUE:

The Court has reviewed both the defendant's and State's memoranda that were prepared at the direction of the Court upon completion of the *Frye* hearing held on November 24, 2003. At the hearing, the Court heard from Dr. Sinha, the president and laboratory director of Reliagene, the company that has produced a kit for Y-STR testing. The Court also heard testimony from Dr. Mike Hammer, a geneticist presently employed by the University of Arizona and, finally, from Dr. James Walsh, an expert in theoretical and statistical population genetics. The Court has also reviewed Volume 15, Number 2, July 2003, of the Forensic Science Review, as well as other materials on the subject of Y-STR in an attempt to determine whether Y-STR technology is generally accepted in the relevant scientific community for forensic analysis and ultimate testimony in courts of law. The Court notes that the parties nor the Court could locate any appellate cases dealing with the issue of whether or not Y-STR technology is generally accepted in the relevant scientific community. However, the technology is widely accepted in Europe and has been used in the United States significantly in paternity determinations and other civil cases. The literature indicates that Y-STRs are useful for analysis of stains in forensic investigations where a male subject is involved. Mixtures of body fluids from different individuals are frequent, and Y chromosome analysis allows detection of a male DNA fraction in stains involving male/female mixtures

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and the direct determination of the Y haplotype without differential extraction. However, as an example, in paternity cases, a result based exclusively on Y-STRs does not exclude as the father any relative male in the same patrilineage.

Y-STRs are the most used Y chromosome markers in the forensic field due to their typing, simplicity and high level of diversity. STR typing involves simple and reliable polymerase chain reaction (PCR) techniques and is tolerant of very degraded samples. Inclusion of Y-STRs in routine forensic work, according to the literature, requires studies on PCR performance and Y chromosome specificity. There is also an issue of mutation in biological-relationship cases that is required to be considered when determining whether or not Y-STR forensics can be useful in determining a particular perpetrator.

The data bases that have been developed, particularly by Reliagene, are somewhat meager. This, too, is a consideration for determining whether or not Y-STR results are admissible in a criminal prosecution.

At the hearing conducted on November 24, 2003, Dr. Sinha made an impressive presentation concerning his product and the technology surrounding it. He testified that, to his knowledge, only six cases in the entire country permitted Y-STR to be used in Court, presumably referring to criminal prosecutions. Dr. Mike Hammer from the University of Arizona has taught workshops on STR technology and is familiar with Y-STR. He testified that, in general, Y-STR is widely accepted to determine population origins. With regard to the kit prepared by Reliagene, Dr. Hammer testified that it is "gaining more use." Dr. Hammer testified that the kit is "not widely accepted ... people are just catching on." He testified that the science of Y-STR is identical to that of PCR, which of course, has been generally accepted in the scientific community.

THE COURT FINDS that the science of Y-STR technology is generally accepted in the relevant scientific community.

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THE COURT FURTHER FINDS that the statistical rigor of frequency calculations seems to be open to debate but that the use of the entire DNA process as a haplotype has been accepted.

THE COURT FURTHER FINDS that the Reliagene kit, despite the equivocal testimony presented by the State itself, is generally accepted in the relevant scientific community. Reliagene has ASCLD Lab accreditation indicating that the kit has been validated.

THE COURT FURTHER FINDS that while some DNA experts have no problem multiplying the Y-STR haplotype frequency with the autosomal STR derived likelihood obtained from the same sample, the approach ignores the issue of male relatives and confuses two unrelated statistical elements. Thus, the multiplication of the Y-STR frequency by the autosomal frequency is not generally accepted in the relevant scientific community. Therefore,

THE COURT FINDS, overall, that Y-STR technology and the Reliagene kit are generally accepted in the relevant scientific community for the purpose of forensic analysis and admission in cases such as that of the defendant. However, the statistical probability derived from multiplying the Y-STR frequency by the autosomal frequency is not generally accepted in the scientific community. Therefore,

IT IS ORDERED that the State will be permitted to offer testimony concerning the probability statistics only to the extent that the data base of Reliagene would indicate that the defendant's profile was found in 2 of 518 samples tested.

cc: Hon. Howard Fell
County Attorney - David Quantz
~~County Attorney - Elizabeth Hurley~~
Public Defender - Susan Shetter
Harold Higgins, Esq.
Clerk of Court - Under Advisement Clerk

Rhonda Munyon / cg
Deputy Clerk
