



E31 You Call That a Coincidence? The Significance of DNA Database Pairwise Comparison Searches in the Cold Hit Case

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After attending this presentation, attendees will be aware of the significance of litigation in producing the actual number of arrestee- and offender-matches in the DNA database. This presentation will include how much more common DNA profiles are found to match in such databases in contrast to the statistical calculations presented by the government at trial.

This presentation will impact the forensic science community by discussing recent discovery litigation and disclosures which can enhance the reliability and credibility of forensic DNA statistical practices.

Illinois is the first state having a statute authorizing the court to order the production of this type of evidence. Though many other courts and labs have strenuously objected to production of this data, keeping such data hidden from the scientific community is fundamentally wrong. Scientists must openly share their data with one another to challenge all prior assumptions and test existing ones. To ignore this scientific principle by allowing government laboratories to hold onto data without the rigor of examination from outside scientists contradicts the universal principles of good science.

Undoubtedly, the existence of arrestee and offender databases has greatly assisted law enforcement with DNA leads for otherwise closed cases. The statistical calculations that are used showing the rarity of a DNA match have assisted prosecutors in securing countless convictions throughout the country.

But as the size of arrestee and offender databases increase, the likelihood of a coincidental match increases despite the great mathematical odds presented in court to the contrary. Though scientists and defendants have requested the actual data in these databases to examine their significance, the government has resisted all scientific inquiry, calling it not relevant and meaningless.

The actual data suggests otherwise. In 2005, an Arizona crime lab analyst ran a pairwise comparison analysis of the Arizona offender databank. At the time, the databank contained 65,493 profiles. The results showed that the databank contained 122 pairs of profiles matching at nine of 13 loci, 20 pairs of profiles that matched at 10, one pair that matched at 11, and one pair that matched at 12. The 11 loci pair and 12 loci pair were later found to be siblings.

In 2006, a database search of the Illinois Offender Database was ordered and the Illinois State Police initially determined that 903 pairs of nine loci match out of the initial search results released pursuant to defense requests indicate that 28 pairs had 11 loci in common with further loci that indicate the pair is not from the same person; five pairs had 12 loci in common; one of these pairs has further loci that indicate the pair is not from the same person; 1,936 pairs had 13 loci in common; 17 of these pairs have further loci that indicate the pair is not from the same person; 13,618 pairs had 14 loci in common. Of these pairs, 119 have further loci that indicate the pair is not from the same person; 41 pairs had 15 loci in common; and 678 pairs of specimen had 16 loci in common. It is noted that the results were qualified as not verified for twins and multiple profile entries for the same individual and court order verification of the results is pending. The recent results also combine profiles tested at different number of loci.

Disclosure of this data would enhance the reliability and credibility of forensic DNA statistical practices. This will become increasingly important as the National Database continues to grow in excess of 10 million entries.

DNA Database, CODIS, DNA Statistic