B200 Finding Criminals Through DNA of Their Relatives

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After attending this presentation, attendees will learn how familial searching of offender DNA databases should be done and how it can produce a socially significant rate of investigative leads, as well as caution about the potential risks and controversies attendant on the practice.

This presentation will impact the forensic community and/or humanity by informing the community about a potential crime solving tool about which there is a very current controversy. Traditionally the FBI wouldn't touch it, the UK tried it sporadically, and states regarded it nervously. Lately the UK has shown great interest and several recent successes, and in June 2006 the FBI cracked open the door towards approval – developments which have begun to stir public discussion and debate.

This presentation describes a new method for relationship searching in DNA offender databases to generate leads to criminals.[1] The method is immediately practical and figures to increase the "cold hit" rate by a significant amount. It also raises many interesting public policy issues and will accentuate and sharpen ethical debate about offender databases and especially relationship searching.

Heretofore relationship searching has been only sporadically effective. The most famous instance is the capture in 2003 of Jeffrey "Cellophane man" Gafoor for the vicious 1988 murder of Lynette White. Gafoor was not in the UK offender database but his 14-year-old nephew was and fortunately among their shared alleles was one rare one. A successful search based on that rare allele was the critical link in finding Gafoor.

The occasional successes up to now in finding criminals who are in the database "by proxy" – represented by their criminal relatives – have similarly relied on ad hoc searching methods – rare-allele coincidence or "low-stringency" (allele-counting) searching. Neither method works very often. This presentation therefore considers and explores the theoretically far preferable idea of computing the actual kinship likelihood ratios between crime stain and database profiles so as to give full and proper weight to all alleles, shared and unshared, rare or common. Computer simulations show that such "kinship" familial database searching would produce a substantial percentage of new "cold hit" leads. If augmented by additional winnowing strategies – geographical considerations and especially Y-haplotyping of the more promising leads – the cold hit yield can be multiplied further. The method is practical now, and in fact will have been employed with the UK offender database for live cases by the time of the presentation.

Along with technical possibilities come public policy implications. If offender databases have the potential for abuse (as yet not clearly explained), the potential must be all the greater when kinship searching expands the paradigm of database searching from the individual to the family level. Is the system unfair if certain demographic groups – the poor and the racial minority – who never even committed a crime are over-represented (by proxy) in the offender database? Familial searching in particular (while generally acceptable in the UK) seems to be unapproved in U.S. but reasons are vague – invasion of privacy? Fear of public alarm? If inequity is the issue there are two possible resolutions: no database or a universal one. Thus far there has been only a murmur in either direction. Through pressing the issue perhaps that will change.

Kinship searching has the potential to extend the reach of offender databases far more than has been realized up to now, hence the opportunity to have an important impact on the prosecution and consequently the prevention of crime. Both the pros and the cons of this potential should be explored.

Reference:

1   Bieber FR, Brenner CH, Lazar D, Finding Criminals through DNA of their Relatives, Science, June 2, 2006

Familial Searching, DNA Identification, Offender Database