

Familial searching

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Familial searching

- DNA databases often identify suspects, but what if there is no match?
- 'Finding Criminals Through DNA of Their Relatives' – Bieber, Brenner, Lazer (Science, 2006)

POLICYFORUM

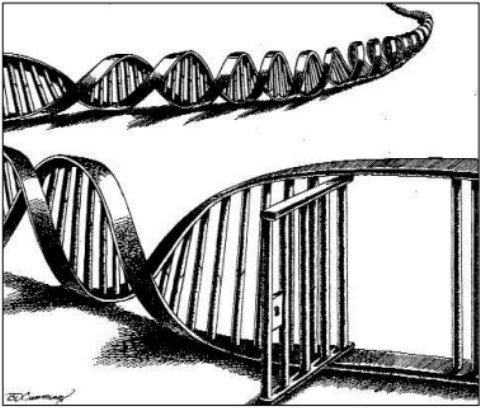
HUMAN GENETICS

Finding Criminals Through DNA of Their Relatives

Analyses of the DNA databases maintained by criminal justice systems might enable criminals to be caught by recognizing their kin, but this raises civil liberties issues.

Frederick R. Bieber,^{1*} Charles H. Brenner,² David Lazer³

DNA methods are now widely used for many forensic purposes, including routine investigation of serious crimes and for identification of persons killed in mass disasters or wars (1–4). DNA databases of convicted offenders are maintained by every U.S. state and nearly every industrialized country, allowing comparison of crime scene DNA profiles to one another and to known offenders (5). The policy in the United Kingdom stipulates that almost any collision with law enforcement results in the collection of DNA (6). Following the U.K. lead, the United States has shifted steadily toward inclusion of all felons, and federal and six U.S. state laws now include some provision for those arrested or indicted.



at a crime scene, and a search. The search compares the crime sample with each catalogued offender in turn by computing likelihood ratios (LRs) that assess the likelihood of parent-child or of sibling relationships (1, 16). We used published data on allele frequencies of the 13 short tandem repeat (STR) loci on which U.S. offender databases are based and basic genetic principles (17–19). A high LR is characteristic of related individuals and is an unusual but possible coincidence for unrelated individuals. The analysis of each simulation therefore assumes that investigators would follow these leads in priority order, starting with those in the offender database with the highest LR for being

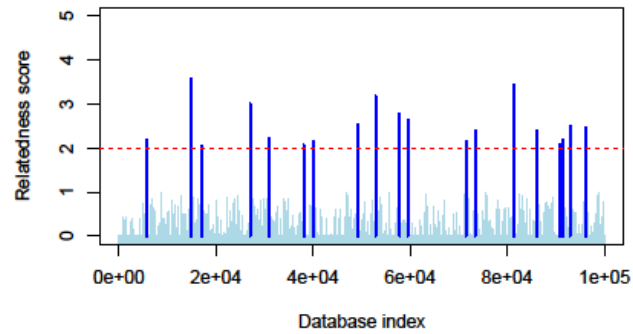
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Goals

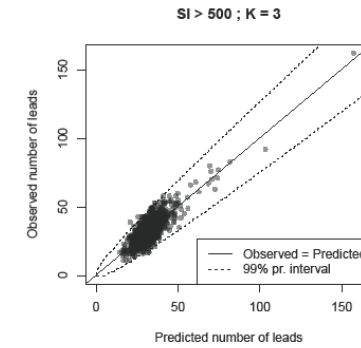
- Evaluate search strategies
- Tackle computational aspects
- Develop predictive models
- Ensure proper evidence interpretation
- Communicate and implement results

Results

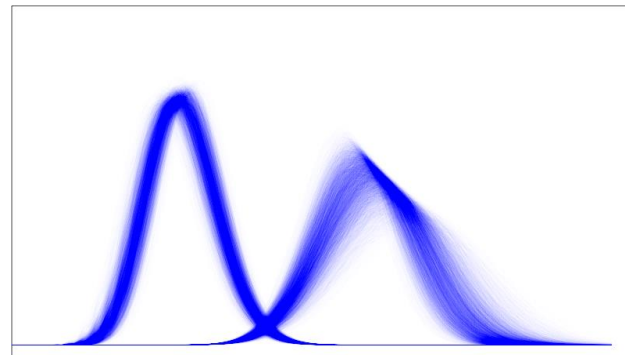
Search strategies



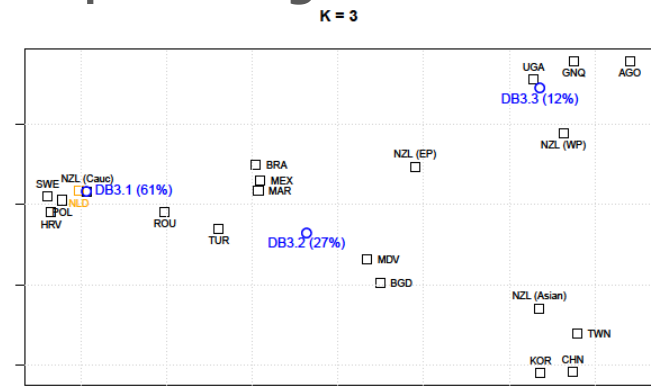
Predictive models



Efficient computations



Population genetics



Outreach

- Results implemented at NFI
- Publications in Forensic Science International: Genetics
- International conferences and workshops
- Continuing international collaborations

Future work

