

# nature genetics

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## DNA, not d.o.a.

Last December, New York City police commissioner Howard Safir proposed the systematic collection of DNA samples from anyone—from illegal subway riders to alleged serial murderers—suspected of committing a ‘fingerprintable’ crime. Safir’s call was quickly seconded by New York City mayor Rudolph Giuliani, who added that he wouldn’t object to retaining DNA samples from newborn babies, for the presumed purposes of determining paternity for child support or identity in kidnap cases. A few weeks later, in his January ‘State of the State’ address, New York State governor George Pataki offered a plan requiring convicted felons’ DNA fingerprints to be entered into a state database.

The well-publicized comments of Safir, Giuliani and Pataki generated immediate outcry from prominent civil rights figures, including Norman Siegel, of the New York Civil Liberties Union, and the Rev. Al Sharpton. Siegel decried the proposals as the makings of a ‘Brave New World’, and opined that equating DNA tests with traditional fingerprints was “a major mistake”. Sharpton, who claims the US judicial system is racially biased, feels the tests would be threatening to minorities and vowed to fight the proposals. Appearing at a news conference, Siegel and Sharpton exhorted the audience to chant “DNA is d.o.a. [dead on arrival]”. Safir responded by saying the fears of critics were “unwarranted”.

These controversies have been fueled by expansion of existing DNA testing regimes—testing of violent crime suspects has been used in New York State, as well as many other areas in the United States, for nearly a decade. There are few who would claim that DNA testing in the US—to date—has been invasive or unwarranted. This sentiment is amplified in the United Kingdom, where law enforcement officials routinely conduct ‘DNA sweeps’ during investigation of crimes, sampling many individuals within a given area. A call last year by Peter Gammon, president of the Police Superintendents’ Association of England and Wales, for the creation of a national DNA database of the UK population met with comparatively minor resistance, despite allegations of conflict-of-interest and incompetence in forensic DNA testing<sup>1</sup>.

In the US, DNA testing of felons involved in non-violent crimes has led to instances in which existing samples have been used to later identify violent crime offenders. In the state of Virginia, convicted felons have been routinely sampled since 1989. Paul Ferrara, of the Virginia Division of Forensic Science, points out that over 60% of felons identified in rape or murder cases by the Virginia DNA database originally had their DNA sampled when convicted for non-violent crimes. Ferrara considers two factors to be essential in a forensic DNA testing

program: a suitable database and the capacity to process samples quickly. To facilitate the latter, DNA analyses are largely subcontracted to accredited laboratories, ensuring anonymity and contributing to cost-effectiveness. At present, approximately 25,000 newly convicted felons are tested per year, with a backlog in excess of 600,000 gradually being absorbed. Of Safir's proposal, Ferrara says, "at this point in time, there are some serious logistical issues, and it would involve considerable expense to run all of those samples in a timely fashion".

Proponents of DNA testing point out that it can be (and has been) used to acquit defendants as well as to convict. In the United States alone, post-conviction DNA evidence has been used to exonerate more than 50 prisoners, many of them serving death sentences. Barry Scheck, of the Benjamin N. Cardozo School of Law and a leading legal advisor on DNA testing, notes that in sexual assault cases, DNA testing has excluded nearly 25% of primary suspects. Nevertheless, on testing the DNA of newborns, Scheck is more cautious, claiming in a *New York Times* interview "[no] bioethicist of any stature... would condone the taking of blood samples from children at birth for purposes like what the Mayor [Giuliani] is talking about" and "it would be a step towards a total-surveillance society<sup>2</sup>".

The Pataki administration touts DNA testing as the "fingerprints of the 21<sup>st</sup> century", and DNA-based testing methods do offer significant advantages over traditional forensic methods in that small amounts of primary material can generate large quantities of data. Yet—while lauding the advantages—proponents have often chosen to overlook the most obvious negative aspect of DNA testing: DNA contains vastly more information than an ordinary fingerprint, information that could conceivably (and easily) be used for purposes other than those originally intended by the creators of the database. For the moment, the 'Brave New World' scenario seems far-fetched, but with databases rapidly filling with genomics data, it is not difficult to foresee enormous potential for misuse of such data, perhaps even under the auspices of revealing possible genetic bases of criminality. Indeed, Ferrara mentions that he has been informally contacted by researchers wishing access to the Virginia DNA database, which is prohibited under Virginia state law.

Considering the exponential growth in PCR technology over the last decade, it is inevitable that the increasing power of DNA analysis techniques will allow Safir's proposal to become logistically possible. Such rapid technological advances may also complicate the ability of legal systems to establish guidelines for DNA data. Mark Rothstein, of the University of Houston Law Center, notes that "there are presently more legal deterrents [in the US] against gaining access to video rental records than medical records", which is surprising given the traditional emphasis in the US on the rights of the individual. While it may be that convicted felons have given up some of these rights, DNA testing of arrestees, coupled with incomplete provisions for ensuring confidentiality of data, allows great potential for misuse. Use and acceptance of DNA testing on suspects in criminal proceedings rely on the pledges of various agencies to destroy the samples of those not convicted following case resolution, as well as ensuring anonymity at all times. Such policies must be legislated and actively enforced from the inception of a comprehensive DNA testing policy.

Omissions, exaggerations and lack of technological understanding by both pro and anti-DNA testing factions have inflamed the DNA testing issue, causing it to become a political 'football' in the struggle between opposing sides to appeal to constituencies whose interests are at odds. Unfortunately, those who have created the technology have remained largely uninvolved—and uninterested—in the discussion. The voice of the genetics community is an essential addition to carrying out what has been, to date, a debate between politicians, lawyers and civil rights leaders.



1. Erzinçlioglu, E. British forensic science in the dock. *Nature* **392**, 859–860 (1998).
2. Lambert, B. Giuliani backs DNA testing of newborns for identification. *The New York Times*, 17 December 1998.