DNA at 32 - what will it be like when it's 64? A forecast in the Irish context

Sheila Willis

Jeffreys

- Potential all illustrated in first example of use of DNA
- Elimination
- Linked cases
- Mass screen
- Co-operation

Junk DNA

- Revolutionized forensic science
- System with very high discrimination
- No association with phenotype

Ireland late into the game

- Robin invitation related to reasons why Ireland didn't establish a DNA database until recently
- Case work samples mid 90s

Irish experience

- 2000 conference on the value
- Attorney General, Mr. Rory Brady SC, acting pursuant to section 4(2)(c) of the Law Reform Commission Act 1975 requested the Commission to consider the following matter;
- "The establishment of a DNA Databank. I would appreciate that in your consideration of this issue you would address the complex constitutional and human rights issues that may arise. In particular, the classes of DNA profiles, that would make up the database, would have to be addressed. For instance, would the database include suspects who have not been convicted".

9:36 PM

reform.ie

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The Law Reform Commission

REPORT

THE ESTABLISHMENT OF A DNA DATABASE

(LRC 78-2005)

IRELAND The Law Reform Commission 35-39 Shelbourne Road, Ballsbridge, Dublin 4.

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IRELAND

The Law Reform Commission

35-39 Shelbourne Road, Ballsbridge, Dublin 4

NEWS	SPORT	BUSINESS	OPINION	LIFE & STYLE	CULTURE	
Election 2	016 Ireland	World Politic	s Crime & La	aw Social Affairs	Health Educ	

Tue, Mar 15, 2016

Law Reform Commission calls for limited DNA database

Tue, Nov 15, 2005, 00:00

A limited DNA database should be established, according to the Law Reform

Reworked DNA Bill seeks balance betwe privacy and better crime detection

Concerns about transmission of DNA data to other countries

O Thu, Sep 12, 2013, 01:00

Ruadhan Mac Cormaic



DNA can disclose complex information about a person's family relationships, ethnic group and medical conditions, and continuous advances in science make it impossible to determine the full capabilities of DNA information.

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Thurs	day, April 2	9, 2010								
-n	TER human rights protections are needed in the Government's legislation to establish a DNA database by gardaí, an Oireachtas Committee has heard.									
	sh Human Pichts Commission (ILIPC) expressed concern that sections of a draft Criminal Justice Pill blish the DNA data 'to respect human rights'									
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Irish Examiner



A database of DNA samples from convicted criminals and suspects will respect human rights, minister Alan Shatter says

Justice Minister Alan Shatter has insisted a new database of DNA samples from convicted criminals and suspects in serious crimes will respect human rights.

The idea for a national DNA database has been circulating for a decade.

Interventions

 One day seminar on DNA fingerprints, gait analysis, ear prints - - -

Bioethics **BIOMETRICS:** ENHANCING SECURITY OR INVADING PRIVACY? **OPINION**

- 486 Law Reform Commission (2005). Report The Establishment of a DNA Database. (LRC 78-2005), Law Reform Commission, Dublin, 129p. 487 Jain et al. (2004) op. cit.
- 488 European Commission Joint Research Centre, Institute for Prospective Technology Studies (2005) op. cit.
- 489 Law Reform Commission (2005) op. cit.
- 490 Nuffield Council on Bioethics (2007). The Forensic Use of Bioinformation: ethical issues. Nuffield Council on Bioethics, London, 139p. Available online at: http://www.nuffieldbioethics.org/fileLibrary/pdf/The_forensic_use_of_bioinformation_-_ethical_issues.pdf, accessed 31 October 2007.
- 491 Each piece of DNA is made up of two strands, *i.e.* one from each parent, and these may contact much sumbers of fragments at a given locus.

BIOMETRICS: ENHANCING SECURITY OR INVADING PRIVACY?

molecule.⁴⁹² In the case of forensics, the first stage in DNA analysis involves the collection of a DNA sample (a collection of cells), such as blood or hair,⁴⁹³ for example, from a crime scene. The DNA is then isolated from this sample and the targeted loci are first amplified,⁴⁹⁴ then the DNA is cut and sorted so that the different sections are arranged by size, *i.e.* related to the number of repeating units.^{495,496} The final DNA profile when transcribed is a digital representation of the requisite areas of variability with the number of repeat units at each locus indicated (see Figure 9).⁴⁹⁷

(see Figure 9).⁴⁹⁷ Well referenced

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particular genetic make-up. It has been argued that both European and national regulations currently offer inadequate protection to completely prevent function creep.⁵¹⁴

As previously mentioned, genetic information used in DNA identification (polymorphisms in the non-coding repetitive regions of DNA) was not thought to yield any information relating to specific traits or predispositions. Therefore, the information gleaned from DNA profiles could not be used in ways that would exceed that of individual identification. However, more recently it has become clear that information relating to race, ethnicity and familial relations can be derived from the non-coding regions of DNA. For example, the British Forensic Science Service has for some time been actively pursuing the possibility of predicting physical characteristics of individuals from their DNA profiles. They maintain that they have the capacity to discern, with unknown degrees of certainty, certain hair colour and ethnic origin.⁵¹⁵ Further research is being carried out in order to enable identification of height, eye colour and facial characteristics from DNA profiles. Finally, it should also be noted that information generated from DNA profiles does not simply relate to one individual. The closer the biological relationship between two people, the greater the chance of gaining information about person A by analysing the DNA profile of person B, *i.e.* DNA can be used to probabilistically identify family members, which raises ethical concerns when viewed in the larger sociological context.

G

Multimodal Biometrics

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Rights watchdog to scrutinise privacy safeguards in DNA Database Bill



Press release – for immediate release Tuesday, 19 January 2010 Ireland's leading rights watchdog, the Irish Council for Civil Liberties (ICCL) has said that it will review the Government's new DNA Database Bill to establish if it now strikes th...

Human Rights Compatibility of a DNA Database

October 10, 2003

Human Rights Compatibility of a DNA DatabaseICCL Position Paper

ICCL Position Paper on the Establishment of a DNA Database 2003

October 1, 2003

ICCL Position Paper on the Establishment of a DNA DatabaseICCL posi human rights compatibility of the establishment of a DNA database

Watchdog calls for privacy guarantees on DNA c

September 11, 2013

11 September 2013 Press release – for immediate release Ireland's I watchdog, the Irish Council for Civil Liberties (ICCL), has welcomed th today (11 September 2013) of draft legislation intended to establish a

Irish Council for Civil Liberties

The Irish Council for Civil Liberties (ICCL) is Ireland's leading independent human rights watchdog, which monitors, educates and campaigns in order to secure full enjoyment of human rights for everyone



Policy

Legal

International

IHREC Designate calls for stronger human rights safeguards in DNA Bill

Issued : 11 April 2014

Your Rights

About

IHREC DESIGNATE CALLS FOR STRONGER HUMAN RIGHTS SAFEGUARDS IN DNA DATABASE LEGISLATION

Enabling Change

The Irish Human Rights and Equality Commission designate (IHREC designate) today published the Irish Human Rights Commission (IHRC's) <u>observations</u> on the Criminal Justice (Forensic Evidence and DNA Database System) Bill 2013 (2013 Bill). The IHREC designate acknowledges the potential of a DNA Database System as a tool for the Garda Síochána for crime investigation. However, it recommends that the Bill include more safeguards which are essential to ensure that the Bill does not give rise to violations of human rights.



Coimisiún na hÉireann um Chearta an Duine agus Comhionannas

Irish Human Rights and Equality Commission

Mr David Joyce, Acting Chair of IHREC designate said, "The Bill has implications for human rights, in particular the right to privacy. The guarantee of a person's right to privacy is fundamentally affected by the taking, retention and storage of their DNA profile on a database and by the use of that profile. Some provisions and safeguards in the Bill are in line with earlier recommendations by the IHRC on the previous 2010 Bill and we welcome that. However, it is vitally important that this legislation is underpinned by rigorous safeguards governing the taking, retention, storage and destruction of bodily samples and DNA profiles. The scope of the DNA Database System must be limited to the primary purpose of crime investigation."

In relation to the taking of DNA samples, Mr Joyce, continued: "the IHRC considers that the power to take bodily samples, solely for the purpose of entering a DNA profile on the DNA Database System, and not for investigating an offence for which a suspect is detained, is too broad. The IHRC is concerned that such a power risks being applied in a disproportionate and arbitrary manner and recommends that samples should be taken only for the purposes of investigating a specific criminal offence."

The 2013 Bill allows for the mass screening of groups of people ("class of persons") defined by certain characteristics to be conducted in situations where there are reasonable grounds for believing that the mass screening of the target group is likely to further the investigation of an offence and is a reasonable and proportionate measure. IHRC Acting CEO Dr Des Hogan said "we are concerned that the identification of a class of persons could potentially be directed, either explicitly or inadvertently, at a racial or ethnic minority in the State. This would be wholly unacceptable and the 2013 Bill should explicitly prohibit such identification".

IHRC considers that the power to take bodily samples, solely for the purpose of entering a DNA profile on the database system ---- is too broad



Challenges

- Technology moved faster than ability to deal with it
- Didn't learn from trace
- Real dangers related with over interpretation
- No real attempt to distinguish between full profiles with clear attribution and mixtures

Solutions at the scene

- Virtually possible today
- Certainly possible in 48
- Issues likely to be processes rather than technology

Evaluation

- Stop confusing source / sub source with activity
- Three principles elucidated by Evett still. Highly relevant
- Interpreted in a context
- Consider at least two propositions
- Scientist equipped to comment on the findings not on the proposition
- Hope for progress in use of guidelines in next 32 years

Attribution

- Cell type
- RNA
- Light it up antibody solution

Bound to be progress in 48

Phenytype

 Amount of limited progress to date suggests that we will progress in linking genotype and phenotype - ethical issues - discuss difference between verbal descriptions and scientific finding
parallel with database

Progress from left field

- Major discoveries in forensic science not as a result of research in the field - some exceptions
- Medicine progressing personal solutions based on individual's genome - potential for forensic applications - seize someone's meds and compare with materials from crime scenes science fiction or possibility?

Ethnicity

- Difficult to know whether this will be of practical assistance or not
- Mixture of people's
- Few pure races unlikely to be definite
- Similar to classifying glass types cluster analysis with notable exceptions

Full genotype elucidation

- Possible to do today will get cheaper
- Who will own these databases
- Will individuals walk round with their genome on a fob in the same way as we do with blood groups?

Thank you