

## **Ethical concerns of developing a database of DNA profiles**

Genetic fingerprinting, more accurately known as DNA profiling, is the technique used to distinguish between individuals of the same species using only samples of their DNA.

This break through in science came about by the British geneticist (now Sir) Professor Alec Jefferey at the University of Leicester in 1984, after he noticed that two humans DNA sequences will be in majority, similar, but that there are certain sequences in DNA (called Minisatellites) that are repeated and do not contribute to the function of DNA [1 and 3].

The main role of DNA molecules is the long-term storage of information and the genetic instructions used in the development and functioning of all known living organisms. Each strand of DNA contains a sequence of bases called nucleotides, which are one of four chemicals: adenine, guanine, cytosine or thymine. As DNA has a double helix arrangement there are two anti-parallel chains, which are connected at each base. These bases only bond specifically with one other base. Adenine (A) will only bond to Thymine (T), and Guanine (G) will only bond to Cystosine (C) [2 and 4].

As there are many millions of base pairs in DNA, everyone's sequence differs. But instead the scientist's now compare differences in length of repetitive DNA sequences, known as minisatellites (SSR's) and short tandem repeats (STR's) [4] to distinguish between individuals. This method is usually an extremely reliable technique for identification of any person (or animal).

Since 1985, DNA profiling of biological material has become one of the most powerful tools for personal identification in Forensic medicine and criminal investigation. The advantages of using DNA is that it provides a huge amount of diagnostic information compared to DNA fingerprinting (which can only identify individuals) and older techniques (such as blood group typing, because it is present in all biological tissues, and it is much more resistant to biological degradation than most other biological molecules e.g. proteins [1]

Although DNA profiling has it's advantages and has revolutionised science in general. There are many concerns surrounding the creation of a DNA Database.

The scientist who pioneered genetic fingerprinting (Professor Sir Alec Jeffreys) has voiced his concern about the DNA of innocent people being held by police saying that it "raises significant ethical and social issues." [3]

It cannot be ethically right that the state holds such personal information of any individual. In the European human rights it states our right to privacy (defined as the freedom from observation or intrusion) [6]. The database is a clear invasion of privacy, especially if now the government is allowing the police to take a DNA sample from any individual arrested, without their consent, even if they have not been charged. DNA can provide much further insights into many intimate aspects of an individual and their families including susceptibility to particular diseases, legitimacy of birth, eye colour, ethnicity and perhaps in the future predispositions to certain behaviors and sexual orientation. This information increases the potential for genetic discrimination by government or other agencies holding sensitive information. [5],

When first launched on the 10<sup>th</sup> April 1995, DNA samples were only analysed and stored on the database, by the police, if it was of a convicted criminal with consent. Therefore given that consent was required before taking the samples, and only of convicted criminals, it seems to be ethically reasonable. As it is good for the rest of society and by committing the crime the offender has brought the breach of their privacy upon themselves [5]. Following a change of the law on the 4<sup>th</sup> April 2001, all DNA collected by the police, for whatever purpose, whether or not the person has been charged or convicted, can be stored permanently without their consent [5]. Clearly this has gone past the point of the ethically right as now we have no choice whether or not our DNA is stored. This is most definitely a breach of our right to privacy, and shows the control and power that our police force possess. Today, the police of England and Wales have wider sampling powers than of any other police force across the world due to a succession of Acts of Parliament and legislative amendments [8]. This explains why proportionally the U.K has the largest forensic database in the whole world (more than 3.4million profiles by the end of 2005) [7]. There has to be a limit to police powers, DNA shouldn't be retained simply on the basis that it might turn out to be useful. Worryingly there has been a gradual expansion of the database without considerable public debate, so where do we draw the line? Views on whether the laws allowing police to take, store and analyse DNA should be revised amid the concern over the lack of public consultation about the database.

What's also worrying is that the personal information taken from the DNA samples could be misused without our knowledge or discussion. There are examples of this already occurring; police forces use the private company LGC to analyse DNA samples that they have taken. LGC then supplies the information to the National DNA Database. But secretly LGC has been

keeping copies of the genetic samples and personal details of hundreds of thousands of people including their names, ages, skin colour and addresses. Also evidence has emerged that the Home Office has given permission for a controversial genetic study to be undertaken using the DNA samples on the police database to see if it is possible to predict a suspect's ethnic background or skin colour. Therefore thousands of people are taking part in controversial genetic research without their knowledge or consent. [9]

Another argument against having a DNA database is the belief of prejudice surrounding it; innocent members of ethnic-minority communities are almost three times more likely than innocent white people to have their DNA profiles on the database. This example of how the criminal justice system remains biased against ethnic minorities. The database contains the DNA of nearly 40 per cent of black men, many who have not been charged. If such bias is present the police force would be breaching the minority groups human rights of being treated equally and not to be discriminated against [6].

During a law lecture at the University of Leicester Lord Justice Sedley, a prominent senior judge in the Court of Appeal (since 1999) also highlighted his concerns over the DNA database. Instead calling for a national DNA database to be set up which would record every individuals DNA in the country as well as those leaving or entering the country. He argued that under the present system the difficulties in securing reliable evidence have led to miscarriages of justice. The only samples that are currently held are from persons who have been arrested, whether or not charged or convicted also voluntary samples (e.g. to be eliminated as a suspect in a criminal investigation and this sample is permanently stored, irrevocable). Unfortunately this is putting the “innocent on a par with guilty”. [10] Therefore he as do I believe it would actually be fairer if everyone was recorded on the database, as then everyone would be treated equally, part of our human rights [6].

The original aim of the DNA database was to be able to match DNA at a crime scene with a suspect. But now thousands of people are on the database, whether they have been convicted or not, making them automatic suspects for any future crime this seems a step to far. Undermining the principle in the U.K that we are innocent until proven guilty, with the database those that have been put on it are actually presumed guilty until proven innocent.

The DNA database must be reviewed further with public opinion included, as the system clearly has negative aspects which much be looked at, to see whether the database really is worth will for society.

## **Bibliography**

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