

Bioethics and DNA Databases

Many people and organisations are interested in analysing peoples DNA and in keeping their DNA in a database.

Parents may want to have their DNA analysed to find out the risk of having a child that may be affected by certain genetic diseases such as cystic fibrosis, or to test a new born baby for genetic diseases such as Alzheimers, which may be visible only when the child is older. This allows the parents to try to help the child before the symptoms become too serious.

Police around the world currently use 'DNA fingerprints' or 'profiles' to identify people, as each profile is known to be unique to that person. These are used as a form of evidence which can be used to prove a suspect's guilt or innocence, to identify an unknown body, or to find out who touched an object found at crime scene, for example a cigarette, by finding cells containing DNA.

In Scotland, the police take a DNA sample from everybody they arrest, and once a suspect is convicted their profile is put onto the police National DNA Database. If they are not convicted, their DNA profile is destroyed. The National DNA Database helps forensic scientists to compare DNA evidence found at a crime scene with a DNA profile kept from a previously convicted criminal. Whilst the process of collecting the samples and putting the DNA profile on the database is double checked, rare errors are possible.

In medical research, scientists are interested in finding genes responsible for genetic diseases. To do this, scientists compare DNA from a group of healthy people with samples from a group of sufferers of a certain disease. This method is very useful and it has helped to find genes contributing to many diseases, including coronary heart disease, diabetes and arthritis. 'Generation Scotland' and 'Biobank' are both creating DNA databases of both healthy people, and sufferers of certain diseases and their families, in order to better understand the disease.

Some pharmaceutical companies are developing drugs that will help some specific people, as the analysis of a person's DNA may reveal their response to the drug. An example is the drug Herceptin, which is used in breast cancer sufferers who have too many copies of a gene which causes the disease. This drug however is not helpful to patients with normal numbers of this gene, or with different types of breast cancer.

There have also been several cases where a pharmaceutical company has discovered and patented a disease gene in order to control its use. An example of this is Myriad Genetics, a company which is designing treatments for people with a faulty breast cancer gene (called BRCA); however they are using their patent to prevent others from researching and selling other treatments for this genetic problem.

Insurance companies have shown interest in using DNA analyses of their clients, often basing their insurance on the information revealed, such as the likelihood of their client developing a disease. Some employers are also interested in their employees' DNA for similar reasons, but there is great debate about using DNA in this way as it can lead to discrimination based upon a person's genetics.

A relatively new type of company to show an interest in analysing peoples DNA are personal genomics companies such as '23 and Me'. People pay to send DNA samples for analysis, and receive a review of what diseases they might have now or in the future. Some of these companies also offer to make family trees using data from many of their customers. These companies have sparked controversy because of uncertainty in the quality of their results. A famous biologist, Craig Venter, has tested this by sending the same DNA sample to two different companies, and he received two different results.

Public interests in peoples' DNA have created the problem of the invasion of personal privacy, as DNA can reveal many personal things about a person's health and family connections.

Whilst collecting large numbers of DNA samples for use by, for example police or doctors, is proving important for crime solving and discovering new disease genes and cures, it is important to strike a good balance between the protection of an individual's privacy and the greater good of the population.

This is a major bioethical issue which needs to be discussed from both sides, allowing laws to be made to protect this balance.