

What is a designer baby?

Advanced reproductive technologies allow parents and doctors to screen embryos for genetic disorders and select healthy embryos.

The fear is that in the future we may be able to use genetic technologies to modify embryos and choose desirable or cosmetic characteristics. *Designer babies* is a term used by journalists to describe this frightening scenario. It is not a term used by scientists.

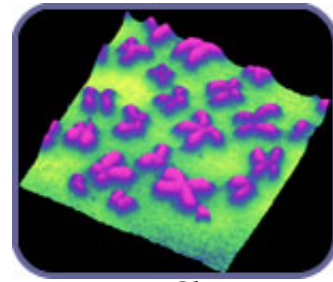
Advanced reproductive techniques involve using **InVitro Fertilisation** or to fertilise eggs with sperm in 'test-tubes' outside the mother's body in a laboratory. These techniques allow doctors and parents to reduce the chance that a child will be born with a genetic disorder. At the moment it is only legally possible to carry out two types of advanced reproductive technologies on humans. The first involves choosing the type of sperm that will fertilise an egg: this is used to determine the sex and the genes of the baby. The second technique screens embryos for a genetic disease: only selected embryos are implanted back into the mother's womb. This is called **Pre-implantation Genetic Diagnosis (PGD)**.

Recently scientists have made rapid advances in our knowledge of the human genome and in our ability to modify and change genes. In the future we may be able to "cure" genetic diseases in embryos by replacing faulty sections of DNA with healthy DNA. This is called **germ line therapy** and is carried out on an egg, sperm or a tiny fertilised embryo. Such therapy has successfully been done on animal embryos but at present it is illegal to do this in humans.

However, it is legal to modify the faulty genes in the cells of a grown child or an adult to cure diseases like cystic fibrosis - this is called **body cell gene therapy**.

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- **Can we choose a baby's sex?**
- **Testing for disease?**
- **Germ-cell gene therapy in monkeys?**
- **Body cell gene therapy in toddlers**

Today it is possible to choose the sex of the embryo using advanced reproductive techniques during **IVF**. Doctors can do this using one of two methods. The first method is to sort out a sample of the father's sperm and only fertilise the egg with either 'male' sperm or 'female' sperm. The second method is **Pre-implantation Genetic Diagnosis (PGD)**, which is used to screen-out embryos likely to have a genetic disease.



Chromosomes

PGD takes place during **IVF** where the sperm fertilises the egg in a "test-tube" in a laboratory. The fertilised egg grows for a few days before a single cell is removed and tested to find out either the sex of the embryo or if abnormal genes are present. Surprisingly, removing one cell does not seem to affect the embryo's development.

Determining the sex of an embryo can be useful because some genetic diseases, like haemophilia and Duchenne Muscular Dystrophy, only show themselves in male babies. If the parents have a history of male-related disease, then techniques such as **PGD**, can be used. Doctors then choose a healthy female embryo without the faulty gene and implant this into the mother's womb to grow into a healthy baby.

In most countries sex selection is only permitted to avoid diseases that are linked to a certain sex. In Britain it is illegal to select the sex of a child just because the parents want either a boy or a girl.

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