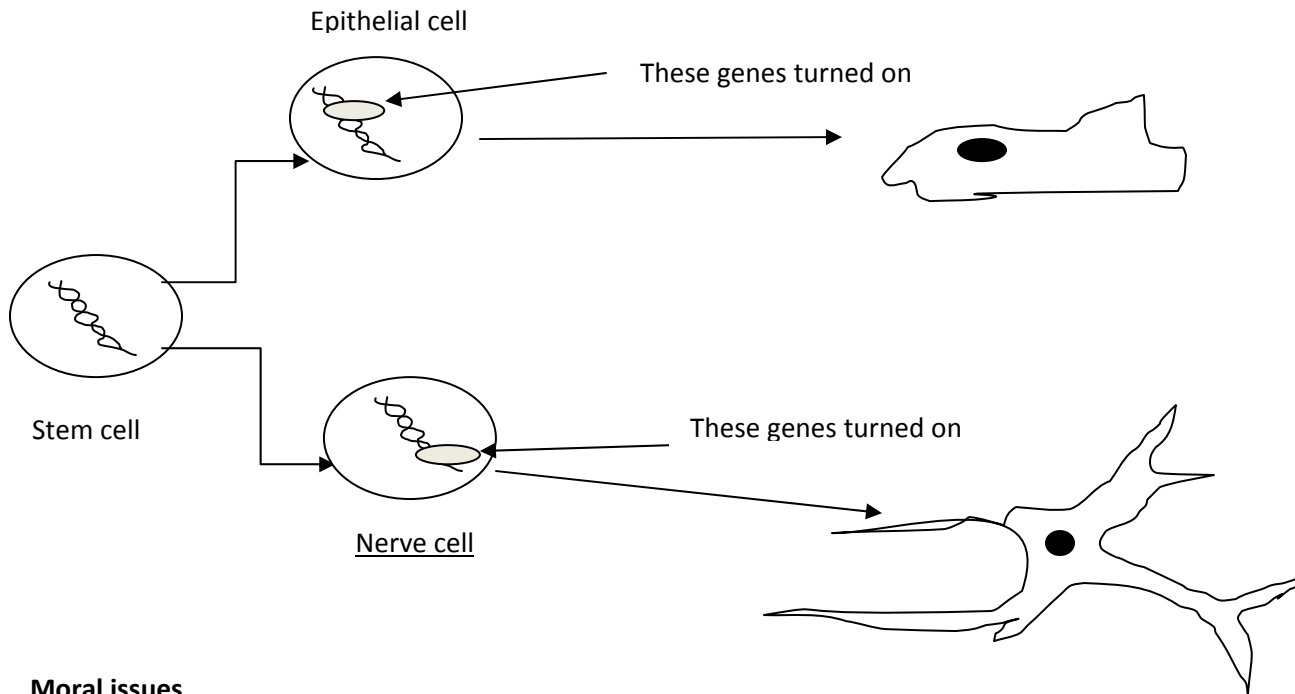


## Stem Cells & Differentiation

All cells in your body (except your eggs or sperm) have 46 chromosomes. Each chromosome has hundreds and hundreds of genes that code for certain characteristics. Humans have 46 chromosomes. Different organisms have different numbers of chromosomes. A badger has 32 and a bean has 22.

Stem Cells – an undifferentiated cell that has the potential to become any cell! Human stem cells have 46 chromosomes. As a young person, the only stem cells you have are in your bone marrow. These have a limited ability to differentiate into different blood cells only (white blood cells, red blood cells or platelets)



### Moral issues

Because real stem cells can become any cells, there is hope that they can be 'turned on' to be what we need. So if someone has damaged nerve tissue, perhaps doctors can 'turn on' stem cells and grow new nerves!

Embryonic stem cells - after an egg is fertilized within a woman, the cells divide into an embryo. These cells are stem cells. There is some controversy here. Embryos are an ideal source of stem cells but harvesting them means killing the growing child (the embryo).

Umbilical cord – turns out your umbilical cord is a source of stem cells. No controversy harvesting these as the umbilical cord is no longer needed after you are born. Parents can choose to freeze their child's umbilical cord in case stem cells are needed in the future. Perhaps when you have a child you have freeze the umbilical cord!