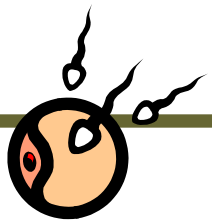
science FRONTIERS



So, What Do You Wanna Be?
(Stem Cells)

Cells produced in the first stages of the zygote, after the egg is fertilized by the sperm, are called **stem cells**. Certain stem cells are capable of becoming any of the more than 200 types of tissue cells needed to make a human body. As the embryo develops, stem cells are directed to become specialized cells, such as neurons, kidneys, skin, *etc*. Once the first specialized cell is produced, it will only produce cells like itself, such as more skin or kidney cells. Every cell contains the genes to make any cell, but once the cell type is determined, only those genes required for that type of cell are active. It may be possible to cause body cells to revert to stem cells but that procedure may not be the most efficient.

With their potential to produce all types of cells, stem cells allow researchers to understand how cells specialize and what information in the DNA activates the required genes for that type of specialized cell. Birth defects and some cancers develop during the earliest stages of the embryo development. If we understand how the specialization is controlled, we may be able to prevent problems. Understanding the mechanisms of control is also useful as we decipher what segments of the DNA are actually genes and which segments are controls for those genes.

Additionally, stem cells offer the potential to produce new, specialized cells in case the organ later develops mutations, such as those caused by carcinogens or environmental agents. This may make it possible to produce a new portion, or even a complete organ, after it becomes damaged. Cloning may be possible using stem cells or the DNA from the nucleus of a stem cell.

The use of embryonic stem cells has opened debate about **ethics** *(deciding what is good or bad)* . Some argue that nothing justifies destroying an embryo, because it has the potential to become a human. Others argue that the benefits to humanity justify the research. This illustrates the kinds of problems that may arise when science shows what can be done and society must decide what ought to be done.

Questions to Talk about and/or Research:
Share some arguments in favor and against stem cell research.
Does stem cell research have implications for a Christian?
If so, what would they be?

Research Ideas
Bioethics, mutations, embryo