What is the purpose of cloning me?

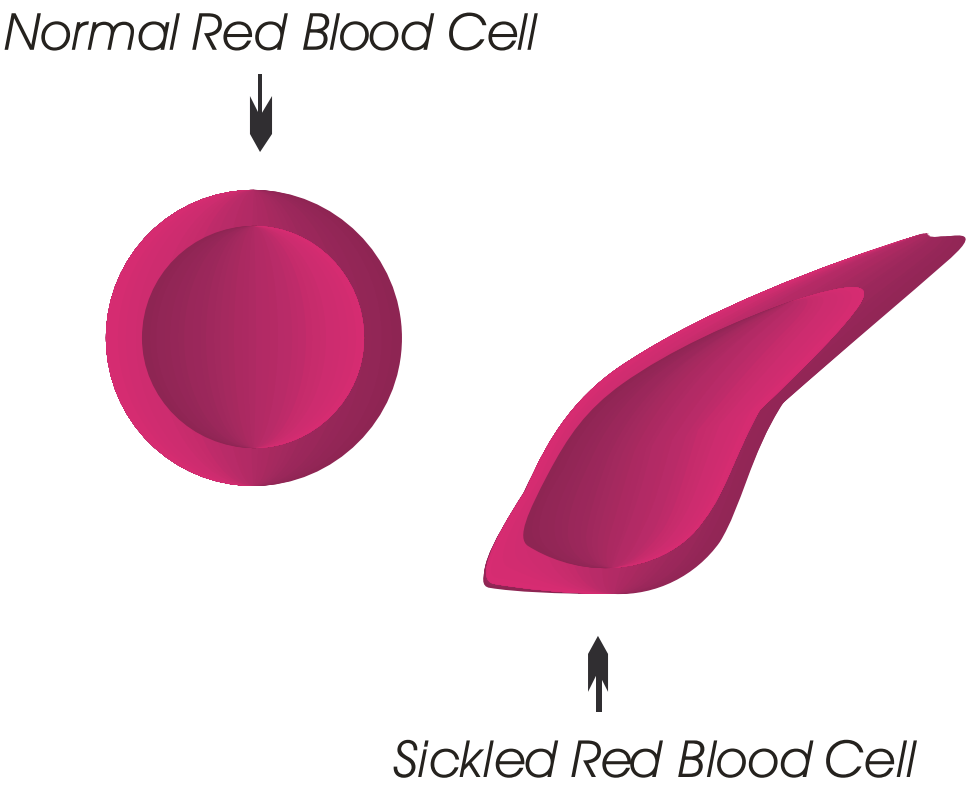
In Medicine:

Genetic Testing and Screening

In the medical field, cloning is used to find out about many genes that cause diseases. Cloning also is used to cure diseases (this is called "gene therapy"). A person can find out if he or she has inherited a gene on a chromosome from an affected parent by a procedure called "genetic screening". If that person has the affected gene, it is possible that he or she will develop the disease.

Predictive Genetic Testing identifies people who are at risk of getting a disease before any symptoms appear.

An example of a genetic disease is cystic fibrosis (as I mentioned before). Some forms of cancer are also inherited. In cancer, abnormal cells multiply unchecked and eventually invade the organs. Another example is hemophilia, a condition in which the blood fails to clot properly after a wound. In the next chapter we will briefly describe yet another genetic illness called sickle cell anemia in which the red blood cells have a sickle or a hook shape (Figure 28). When this happens, the cells fail to move through



Sickle Cell

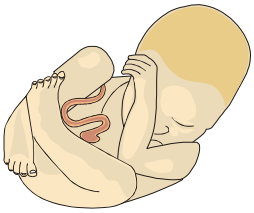
Figure 28

the body, blocking the blood flow to the tissues. The result is pain, and sometimes damage to the organs, followed by death.

How does genetic testing apply in a real life situation?

Mary's dad has just died of colon cancer. Several years ago, his mother died of the same disease. Due to the insistence of her older brother (who has been diagnosed with the disease and is getting treatment) Mary has a blood sample drawn from her to find out if she carries the gene that causes colon cancer. Researchers have found that the gene MSH2 can increase the risk of colon cancer in individuals that carry it in their genes. Mary's test result shows that she doesn't have the gene. Other unknown genes may also cause colon cancer. But Mary can rest assured that she is free of the MSH2 gene that may have killed her father and grandmother.

Newborn Genetic Testing is done on newborns whose parents have a history of genetic diseases.



Fetus

Prenatal Genetic Testing is done on fetuses of pregnant women, especially those who have genetic defects in their families. This is done so that parents-to-be can be prepared before the baby is born. This test can also determine if the unborn child is a boy or a girl.

How does prenatal testing apply in a real life situation?

Cynthia is pregnant. Through an earlier predictive genetic testing, she found out that she carries the gene for hemophilia. Hemophilia is a group of hereditary bleeding disorders of specific blood clotting factors, such as factor IX and VIII. Without these factors, a person can bleed to death. One of Cynthia's X-chromosomes has a defective gene for this factor. She is called a carrier since she has the gene on one of her two X-chromosomes.

Cynthia chooses to do a procedure called amniocentesis, in which the doctor inserts a long syringe into her belly and collects amniotic fluid from the baby. Ten days later, her test comes back positive: the baby is a boy and has the defective gene. Since the baby has only one X chromosome, there is only one copy of the gene, and it is defective. The Y chromosome doesn't carry the gene. Cynthia has a tough road ahead. Her son will need blood transfusions in order to supplement him with the missing factor VIII.

Some drug companies today are either developing the clotting factors themselves, or the genes that make the clotting factors. This means the patient will need fewer or no blood transfusions. The missing clotting factor, or its genes, would be injected into the patient.