Gene Therapy - Weighing the Risks and Benefits

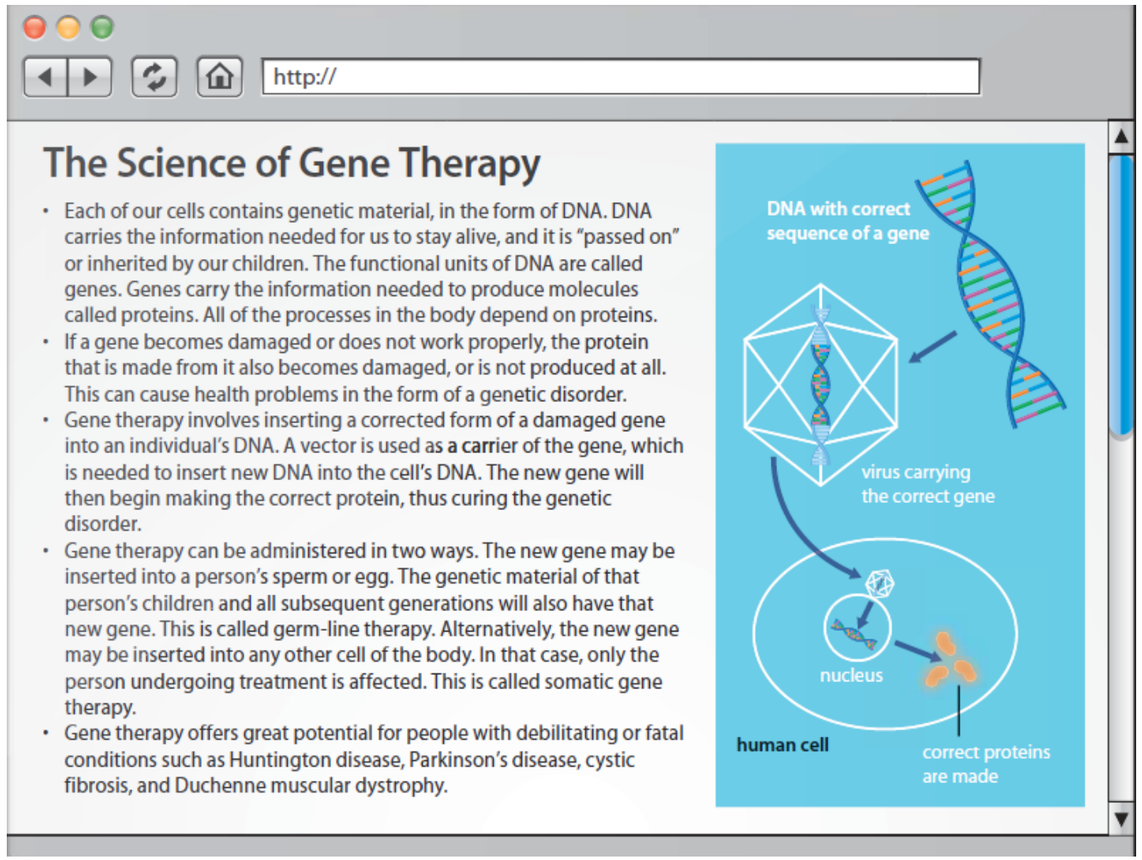
Scenario

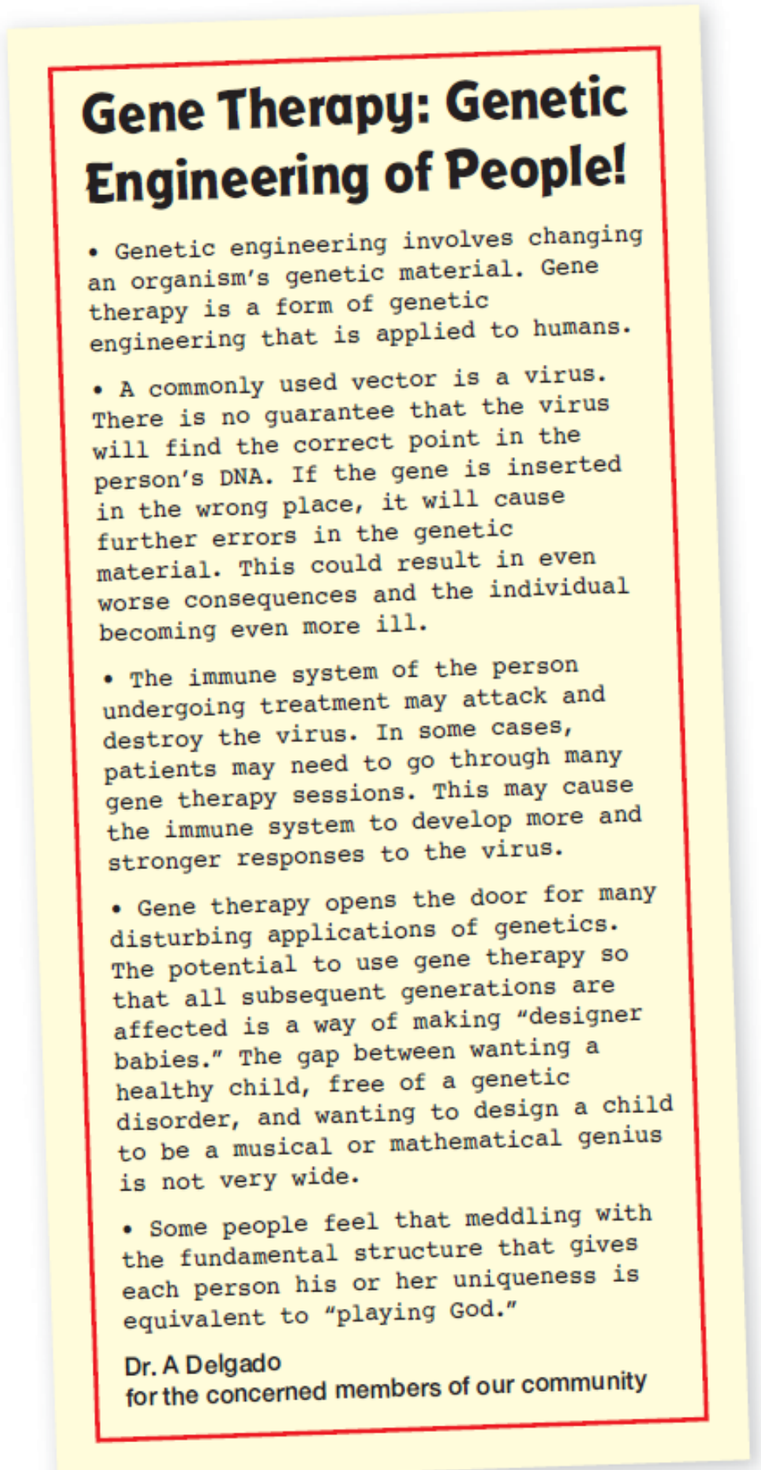
To meet the 40-hour community involvement requirement for your graduation diploma, you are volunteering at a local hospital. One of your first assignments is in a clinic for people who have genetic disorders. The patients and their families come to the clinic to meet with their doctors and evaluate their treatment. A key role of this clinic is to facilitate meetings between patients and physicians who are investigating alternative treatments for genetic disorders.

One treatment that physicians are researching is gene therapy. Many patients are nervous when they come to the clinic. They have questions and concerns, especially about new experimental techniques. The hospital has developed a website (below) that describes the science of gene therapy. However, some people are concerned about the clinic's research into gene therapy and have developed a handout to publicize their concerns.

Your role is to read the information provided by these groups, as well as perform further research on the topic. From this, you will analyze the risks and benefits and develop an information brochure that could be used in the clinic.

READ THE TWO FOLLOWING IMAGES BEFORE STARTING





Gene Therapy: Genetic Engineering of People!

• Genetic engineering involves changing an organism's genetic material. Gene therapy is a form of genetic engineering that is applied to humans.

• A commonly used vector is a virus. There is no guarantee that the virus will find the correct point in the person's DNA. If the gene is inserted in the wrong place, it will cause further errors in the genetic material. This could result in even worse consequences and the individual becoming even more ill.

• The immune system of the person undergoing treatment may attack and destroy the virus. In some cases, patients may need to go through many gene therapy sessions. This may cause the immune system to develop more and stronger responses to the virus.

• Gene therapy opens the door for many disturbing applications of genetics. The potential to use gene therapy so that all subsequent generations are affected is a way of making "designer babies." The gap between wanting a healthy child, free of a genetic disorder, and wanting to design a child to be a musical or mathematical genius is not very wide.

• Some people feel that meddling with the fundamental structure that gives each person his or her uniqueness is equivalent to "playing God."

Dr. A Delgado
for the concerned members of our community

Research and Analyze

1.) Perform further research using google about the basic principles of gene therapy and its applications. Research the risks and controversies associated with gene therapy.

Risks of Gene Therapy	Benefits of Gene Therapy	Controversies Over Gene Therapy

2.) In a group, discuss the ethics of gene therapy. What are the differing points of view about using gene therapy? What key issues must be considered when a person is deciding whether to undergo gene therapy?

3.) In your opinion are the benefits worth the risks and the controversies? Explain

4.) Scientists at the McEwen Centre for Regenerative Medicine in Toronto have developed a gene therapy technique to repair donor lungs before they are transplanted. The technique dramatically improves the success of transplants. As a result, more donor lungs are available to people who are waiting on transplant lists. Research this technique using google. Decide, from an ethics standpoint, whether this type of gene therapy is in the same category as treating the actual genetic material of an individual. Write a paragraph that summarizes your opinion, including supporting details.