How It Works

Gene therapy is the introduction of genes into existing cells to prevent or cure diseases. This example shows how herpes genes can be used to treat brain cancer.

**PROBLEM**
A brain tumor is formed by rapidly dividing cancer cells.

The reason for this rapid division is that genes within the cells are defective.

**THERAPY 1**
A herpes gene is spliced into the DNA of a virus that has been rendered harmless.

The altered virus retains its ability to insert its genetic material into the target cell.

**2**
The virus containing the herpes gene is then placed in mouse cells, where it manufactures additional copies of itself.

**3**
The mouse cells producing the virus are injected into the brain tumor; the virus invades the tumor cells.

**4**
The tumor cells, with the herpes gene now inside them, start to produce a herpes enzyme.

**5**
The presence of the herpes enzyme renders the tumor cells vulnerable to herpes-curing drugs, which are injected into the body; the tumor cells together with the mouse cells are destroyed.

Diagram for TIME by Nigel Holmes. Sources: Genetic Therapy, Inc., Dr. W. French Anderson.
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