

## Recombinant Technology Review

### ***What is recombinant technology?***

The word recombinant is a broad term used to describe the process where the building blocks for cells or DNA are recombined to become something else. Recombinant technology is used to make many types of medications. Vaccines and insulin are often made through this technology.

### ***Why was recombinant technology used for hemophilia?***

The first Factor VIII (8) and Factor IX (9) concentrates were made from blood. These concentrates replaced the factor that was missing and stopped bleeding, but they were not perfect. The main issue was that viruses in the blood supply could be transmitted through these products. Recombinant technology creates a high-quality factor product with the least risk of virus transmission.

### ***How is recombinant factor made?***

Using a series of “cutting and pasting” processes, the FVIII or FIX gene is added to a host cell, which is able to multiply quickly into more cells. These cells are grown in a “bioreactor,” that provides ideal conditions for growth and ensures that the process is free from microorganisms. Once the cells have multiplied, the FVIII or FIX is removed from the fluid in the bioreactor and processed. The final product is identical to human FVIII and FIX.

### ***Why is it important to have recombinant Factor VIII or IX?***

With this technology, pure protein is made in the laboratory instead of being extracted from blood. Recombinant technology produces high-purity proteins that are free from the viruses that may be present in blood-based factor.

### ***Is there only one recombinant product available?***

There is one recombinant FIX product available and several FVIII products. There is currently no recombinant product to treat Von Willebrand disease. The infusion product used to treat Von Willebrand disease is made from human plasma. Several methods are taken to assure that viruses that may be present are killed in this plasma-derived product. Stimate, often used to treat VWD or mild factor VIII deficiency, is an intranasal medication and not an infusion product.

### ***What if I have additional questions?***

Recombinant technology is complicated. The knowledgeable staff at the [IHTC Pharmacy Program](http://www.ihtc.org/patient/bleeding-disorders-pharma.cfm) [ <http://www.ihtc.org/patient/bleeding-disorders-pharma.cfm> ] is available to answer questions you might have. You can contact the IHTC Pharmacy Program by telephone (317 829-7778), fax (317 829-7783), or [email \[pharmacy@ihtc.org\]](mailto:pharmacy@ihtc.org).

*Adapted from an article in the Fall 2008 issue of the IHTC newsletter **The Clotting Times**. Visit the [IHTC Reading Room](#) to read other IHTC newsletters.*