

Decoding the Mysteries of HIV/AIDS

After HIV was first identified in the early 1980s, there were few drugs to treat the virus and diseases associated with it. Several medications have since been developed, but many of these drugs have severe side effects and most are expensive. Although medications have extended and improved the quality of life for HIV-positive individuals, none of them can cure HIV/AIDS.

City of Hope's Department of Virology seeks to understand the origins and biology of deadly viruses such as HIV and to develop ways to treat them using vaccines, genetic therapies and other innovative methods.



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Lidow Family Research Chair*



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A Scientific Path to a Cure

In 1990, John Rossi, Ph.D., Lidow Family Research Chair, and John Zaia, M.D., chair of the Department of Virology, first proposed a revolutionary method to neutralize HIV/AIDS using ribozymes, genetic material that acts as "molecular scissors," to dice up HIV genes and prevent the virus from growing and spreading.

In 1997, Zaia, Rossi and Amrita Krishnan, M.D., director, Clinical Multiple Myeloma Program, began the first-ever ribozyme clinical trial of gene therapy to treat HIV/AIDS. The study used the method proposed in 1990 for patients receiving hematopoietic (blood) stem cell transplants to treat their HIV-related lymphoma. Prior to transplant, the research team gave each patient's stem cells the genes needed to produce the anti-HIV ribozymes. Despite the innovative nature of the approach, results of the study were disappointing and suggested that a different method of gene transfer would be required.

In 2002, City of Hope researchers developed a new system that, ironically, used an altered form of HIV to improve delivery of anti-HIV genes to blood stem cells. At about this time, Rossi also devised a new method of targeting HIV using a combination of genetic materials, which he inserted into the new delivery system. Over the next several years, rigorous testing in preclinical studies showed the system could inhibit HIV.

In 2008, Zaia, Rossi, and Krishnan initiated a first-in-human clinical trial of this new gene therapy, targeting the AIDS virus in patients with HIV/lymphoma. The team is using the system they devised to deliver therapeutic genes to blood stem cells, blocking three genes that are key to HIV growth and making the stem cells resistant to HIV.

In 2008, City of Hope's efforts were further strengthened by the addition of Alexandra M. Levine, M.D., as chief medical officer. Levine is an internationally known expert in lymphoma, Hodgkin's disease, HIV in women and AIDS-related malignancies.

Help Us Conquer HIV and AIDS

Individual donors play a major role in enabling our investigators to pursue studies and advance new standards of care that save lives worldwide. We invite your inquiries as to how you can help us achieve our mission. Please contact our Development Center at 800-232-3314 or via email at giftplanning@coh.org.