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John S. James, Stephen J. LeBlanc, and Kate Krauss

This Saturday, February 20, the AIDS Policy Project will hold a public town hall meeting on the state of AIDS cure research, with expert HIV eradication researchers Dr. Steven Deeks of UCSF, and Dr. David Margolis of the University of North Carolina. This meeting happens right after the most important annual U.S. AIDS scientific conference, held this week in San Francisco. The town hall will take place at the API Wellness Center at 730 Polk St. (near Willow) in San Francisco, from 6 to 9 p.m. All are welcome.

The AIDS Policy Project organizes and educates activists and the community to support research for a cure for HIV. Good research is already happening, but the information often doesn't reach the world outside science circles. Today, most clinical trials test "me-too" drug combinations that will never lead to a cure - but instead create marketing claims for highly profitable pharmaceutical companies. New ideas that could be game changing always find it hard to get funding; more so now with the economic crisis.

Credible AIDS cure possibilities are being studied. (For more information on any of these, see www.aidspolicyproject.blogspot.com). CD4-cell modification approaches have received heightened interest in light of the possible cure of one American Berliner with HIV. The man had successfully controlled HIV with anti-HIV medications for several years. When he was diagnosed with relapsed leukemia, the available remaining leukemia treatment was the destruction of all of his blood's immune cells through radiation and chemotherapy and then a bone marrow transplant. His leukemia doctor, Dr. Gero Hütter, located a matching bone marrow donor who had a mutation called a double CCR5 deletion (found in about 1 percent of Europeans) that makes people immune to most HIV. The double CCR5 deletion donor cells completely replaced the patient's own immune cells in the blood - and the mutation prevented re-infection from any HIV that might have survived in the body.

This patient has been off all anti-HIV drugs for over three years, and no HIV has been found in his body. The bone-marrow transplant treatment is too difficult and dangerous to give to everybody and is generally only used in terminal cancer patients with no other options. But, it is a "proof of principle" for CD4 cell modification therapies. For example, an HIV infected person's own T-cells might be genetically modified to be made immune or resistant to HIV. One such T-cell modification treatment is being studied in clinical trials by Sangamo BioSciences Inc., some of which will be run in San Francisco.

Current anti-HIV drugs treat but do not cure AIDS because a tiny amount of HIV remains in "reservoirs" in the body, generally inside the nucleus of inactive cells, such as CD4 memory cells. Research indicates that only about 1 in 1,000,000 CD4 cells of a person on anti-HIV drugs is latently infected with HIV. Virus inside such cells is not killed by anti-HIV drugs and some of these cells live for a very long time, possibly decades. A few of these latently infected cells constantly become active as a result of the normal functioning of the immune system. So, when anti-HIV drugs are stopped, HIV infection generally restarts quickly.

Therefore, another approach to a cure is to identify drugs that selectively target infected resting CD4-cells. Once a latent HIV-infected CD4-cell is activated, research indicates that the cell dies quickly. Research also indicates that existing anti-HIV drugs might be effective enough to prevent these short-lived activated CD4-cells from infecting any new cells. However, the activating drugs may cause other, unwanted immune stimulation. Finding a therapy that can activate HIV-infected CD4-cells but not cause other harm will be challenging. It is also possible that other reservoirs of HIV may be uncovered after virus from inactive CD4-cells is purged. Margolis, at the University of North Carolina, has conducted trials with one inducing compound (valproic acid), and while this compound is, at least by itself, clearly not sufficient to do the job in most patients, work is continuing to identify better approaches to clear persistent reservoirs of HIV infection.

Other researchers are working on new scientific approaches for detecting HIV activity at levels far below the existing viral load tests. These new tests will be necessary to determine whether or how well HIV eradication therapies are working. Deeks, at UCSF, is working on one approach that measures HIV T-cell activation markers. If successful, doctors could use the markers to determine if an HIV eradication therapy has been effective without requiring a patient to repeatedly stop anti-HIV medication to see if the virus returns.

Human clinical trials aimed at curing HIV will be challenging to conduct because they may require cooperation from several different researchers or institutions that have access to different components of an effective treatment strategy. Companies don't always like to collaborate in this way because they may be asked to give up proprietary information.

Also, these trials might be difficult to fill because the patients needed for enrollment will often be those who are otherwise doing very well on HIV therapy, and there may be some intrinsic risk to initial studies. However, once those barriers are overcome, HIV eradication trials could be much smaller, much faster, and much cheaper than vaccine or prevention strategy trials, which remain vitally important. A proof-of-principal HIV eradication trial might require only a few dozen to 100 enrollees, rather than the thousands that are required for vaccine trials.

Advocacy focused on HIV eradication will increase public awareness of the possibilities and encourage political support for cure research. If you want to help or just keep informed, see www.aidspolicyproject.blogspot.com

- ✚ *John S. James* founded *AIDS Treatment News*, available at www.aidsnews.org
- ✚ *Stephen J LeBlanc* is a member and *Kate Krauss* is director of the *AIDS Policy Project*, which supports advocacy for research to cure HIV.

Reference pages:

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