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German physician honored for AIDS work

NEWS

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San Francisco officials and state legislators, in conjunction with the AIDS Policy Project, last week recognized the accomplishments of Dr. Gero Huetter, the German doctor who made headlines in 2007 when his team achieved the first functional cure for HIV.

"There have been many advances in antiretroviral therapy so people can manage their HIV/AIDS, but we need to get behind those working on a cure," said District 5 Supervisor Ross Mirkarimi, presenting a proclamation from the Board of Supervisors during a ceremony outside City Hall on June 3. "What makes a cure possible is investment of resources and recognizing that it's an achievable goal."

In addition, Huetter, who was in San Francisco last week to attend the International Cord Blood Transplantation Symposium, also received commendations from Assemblyman Tom Ammiano (D-San Francisco) and state Senator Mark Leno (D-San Francisco).

The man Huetter treated – an HIV-positive American known as the "Berlin Patient" – required a bone marrow stem cell transplant due to otherwise untreatable leukemia. Huetter's team managed to locate a donor who was not only a compatible match for the patient, but also had an uncommon genetic mutation that makes cells resistant to HIV infection.

HIV can use two gateways, or co-receptors, to enter cells, known as CCR5 and CXCR4. A small proportion of the population – estimated at about one in 1,000 people of European descent – has a mutation that prevents cells from producing CCR5. Individuals that carry the CCR5 deletion mutation are highly resistant to HIV infection, and those who do become infected may be "elite controllers" who are able to keep the virus suppressed without treatment.

The Berlin Patient received two transplants of hematopoietic stem cells from a donor with the resistance mutation, and his own immune cells were destroyed to eliminate the leukemia. This type of stem cell gives rise to all the various white blood cells that make up the immune system, so the procedure essentially replaces the recipient's immune system with the donor's.

After the first transplant, researchers were unable to find any evidence of continued HIV infection. Today, according to Huetter, the man is in good health, in long-term remission from leukemia, and remains HIV free. A report of the case appeared in the February 12, 2009 issue of the *New England Journal of Medicine*.

"I want to dedicate this honor to the patient I treated," Huetter said as he received the award from Mirkarimi on the steps of City Hall. "I hope this will give hope to other patients that there will be treatment beyond antiretroviral therapy."

Dr. Gero Huetter. Photo: Liz Highleyman

California efforts

It is, of course, not practical for every person with HIV to receive a bone marrow transplant from a resistant donor. What's more, the ablation procedure that destroys the recipient's immune cells so they can be replaced by those of the donor is too risky to use on people who are maintaining relatively good health on antiretroviral treatment.

But the Berlin Patient offers "proof of concept" that has stimulated related research.

The California Institute of Regenerative Medicine, established in 2004 with funding of $3 billion when voters passed Proposition 71 to support stem cell research, has awarded two grants focused on approaches related to Huetter's work.

A team led by John Zaia at City of Hope Medical Center near Los Angeles is attempting to use zinc finger technology developed by Sangamo BioSciences to delete CCR5 from hematopoietic stem cells. The idea is to extract stem cells from an HIV-positive patient, cut out the gene for the CCR5 co-receptor, and return the altered stem cells to reconstitute the individual's immune system with HIV -resistant cells.

"The hope is that we can take this procedure that has functionally cured one person in Germany and make it widely applicable," said Jeff Sheehy, a member of CIRM's governing board and of the AIDS Policy Project, which was started last November to promote HIV cure research.

"We think that with today's drugs, people have lost sight of this goal," said APP member Stephen LeBlanc. "This is not an issue just for the first world, or just for the privileged. We think the time is right now for much more effort to find an actual cure."