

UNITING AGAINST INFECTION

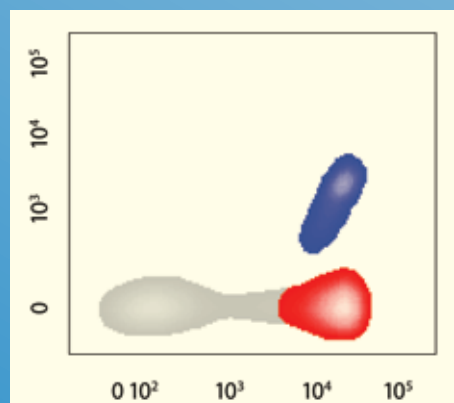
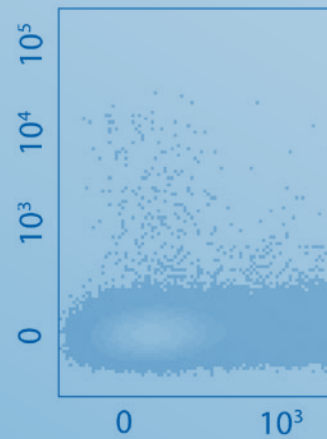
CYTOMEGALOVIRUS VACCINE

Stem cell and organ transplants offer hope to patients with cancer and other serious illnesses. But for the transplant to succeed, the patient's own immune system must be suppressed to reduce the chance of transplant rejection. And that opens the door to infection.

Too often, patients whose immune systems have been weakened fall victim to cytomegalovirus (CMV), a common herpes virus that can be found in 50 to 80 percent of adults in the United States. Normally, infections are mild; afterward, the virus remains dormant, held in check by a healthy immune system. But after a transplant or other immune-compromising event, CMV can reactivate, causing pneumonia and other deadly diseases. About half of bone marrow transplant patients develop active CMV infections; the virus also is a major cause of death in organ transplant patients.

The list goes on: CMV harms dialysis patients, causes blindness in HIV patients and is the leading congenital infection in newborns. CMV is responsible for hundreds of infant deaths and thousands of serious birth defects in babies annually. The Institute of Medicine has called the development of a CMV vaccine a national medical priority.

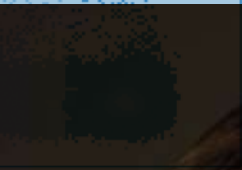
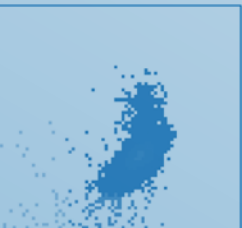
While antiviral drugs can be effective against CMV, they are undesirably toxic. As a much-needed alternative, City of Hope scientists have teamed up to develop a CMV vaccine, based on years of accumulated research. Their efforts took a giant leap forward in 2006, when the Food and Drug Administration approved the first human clinical trial of a synthetic CMV vaccine.



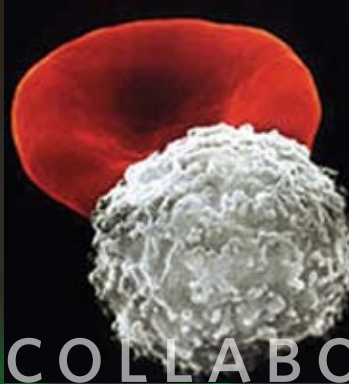
Upper right:
Don J. Diamond, Ph.D.,
City of Hope

Center:
Cytomegalovirus and
red blood cell.

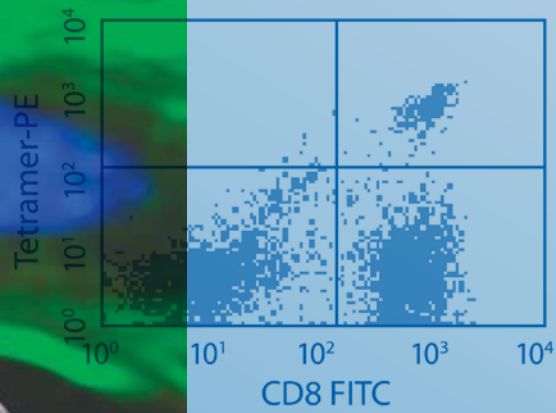
Lower left:
John A. Zaia, M.D.,
City of Hope

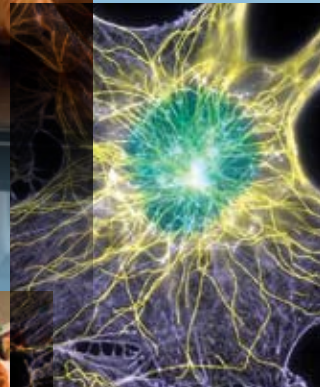


10^4 10^3



COLLABORATIONS





Scientists and physicians work together on a phase I clinical trial to gather data on safety, metabolism and other parameters of the CMV vaccine.

At the heart of the vaccine is a peptide molecule that originated at City of Hope and is now being produced for further studies by the National Cancer Institute.

Don J. Diamond, Ph.D., director of the Laboratory of Vaccine Research, is heading a project in which two formulations of the vaccine are being tested, each with and without a biochemical regulator called an adjuvant. At the heart of the vaccine is a peptide molecule that originated at City of Hope and is now being produced for further studies by the National Cancer Institute (NCI).

In the phase I clinical trial, currently under way, healthy adult volunteers are being given the vaccine in one of its forms to gather data on safety, metabolism and other parameters. Parties collaborating in this groundbreaking project include Corinna La Rosa, Ph.D., assistant research scientist, and Simon F. Lacey, Ph.D., associate research scientist in the Division of Virology, John A. Zaia,

M.D., chair of the Division of Virology, and Stephen J. Forman, M.D., Francis and Kathleen McNamara Distinguished Chair in Hematology and Hematopoietic Cell Transplantation. Coley Pharmaceutical Group is contributing the adjuvant. SAIC-Frederick and the NCI sponsored the development of early data, and the Pasteur Institute furnished preclinical models used in establishing the potency of the vaccine.

In the next phase, transplant donors will receive the vaccine to evaluate whether immunity to CMV can be transferred along with their bone marrow or other tissues. Meanwhile, Diamond and his colleagues are pressing ahead with a second-generation vaccine engineered by Zhongde Wang, Ph.D., M.D., assistant research scientist in the Division of Virology, to combat congenital CMV, with broader applicability in transplant recipients; the project has received long-term funding from the NCI. The National Institute of Allergy and Infectious Diseases and Bernard Moss, M.D., Ph.D., chief in the Laboratory of Viral Diseases, have provided a crucial component to this project, which is anticipated to assist in regulatory approval.