The Cancer Vaccine Program at the Human Immune Therapy Center

The Human Immune Therapy Center (HITC) at the University of Virginia Cancer Center was developed with the goal of discovering novel immuno-therapeutic approaches for the treatment of cancer. Our aim is to initiate a non-toxic war on cancer through immune responses.

In a patient diagnosed with cancer, the immune system has failed to combat the cancer adequately. The goal of immune therapy, in general, and of cancer vaccines, in particular, is to increase and to redirect the patient's immune response against the cancer. The focus of the work at the HITC has been on melanoma, a disease that kills about 8,000 Americans annually, and is on the rise. Many of the principles we learn from studying cancer vaccines in melanoma apply to other cancers.

Developing Cancer Vaccines

Older approaches to cancer vaccines have used cancer cells themselves as the immunogen, with lackluster results. In contrast, we have identified a molecular cancer marker that appears on the tumorous cells of many melanoma patients. These molecular targets are called "antigens." The antigens we target on melanoma cells are those recognized by T-lymphocytes, the cells capable of directly killing cancer cells. The HITC was the first group to identify a peptide antigen directly from human melanoma cells and to sequence it at the molecular level, based on an exciting collaboration among Craig Slingluff, Don Hunt (Chemistry), and Vic Engelhard (Microbiology).

Since then, we have identified several other peptide antigens for the immune response to melanoma, and have pioneered the development of cancer vaccines using complex mixtures of these synthetic peptide antigens. We have expanded the work on a national scale, running three large multi-institutional clinical trials, all funded by the National Institutes of Health. We have developed and led investigator-initiated clinical trials of melanoma vaccines since 1996, and have enrolled about 500 patients in these trials.

As part of the UVA Cancer Center, the HITC was initially designed to focus on treatments for melanoma, but has since expanded to provide investigators with infrastructure to develop and implement clinical trials for other cancers, including colon, ovarian, and breast.

It would be ideal to vaccinate people before they have melanoma (as for viral vaccines), but for the present, cancer vaccines are being optimized in patients with cancer before they can be applied for cancer prevention. We have had good success at inducing immune responses to the vaccines in 80-100% of patients. We also have observed actual tumor shrinkage in some patients, and stabilization of tumor growth in other patients. Survival rates for our patients exceed those predicted, though it is too early to tell if we can ascribe that good outcome directly to the vaccines. Optimization of human cancer vaccines for melanoma and other solid tumors will require greater understanding of the molecular and cellular interactions between the host immune system and the cancer. This will enable even more robust and innovative approaches to target the immune system effectively against cancer.

Funding Future Research

Private gifts will help us extend research in immune therapy by spurring and sustaining productivity, attracting the finest scientists and clinicians, and speeding new therapies safely to the bedside of cancer patients. We are leaders in this effort, nationally and internationally, and with your help, we look forward to great advances in the decade ahead. For more information about joining this effort, please contact Joshua Scott at (434) 243-8432.