**Harold Swartz, M.D., Ph.D., was awarded $16.6 million from the National Institutes of Health to develop a portable device to measure radiation exposure in survivors of a nuclear catastrophe.**

# A break in the quest for a cancer vaccine

For decades, scientists have tried to develop vaccines against cancer using viral vectors, viruses that have been modified so they can't cause disease but can still instigate an immune response. The results have largely been disappointing. "Researchers have tried a lot of different types of viral vectors," says DMS immunologist Edward Usherwood, Ph.D. "But most haven't worked very well."

He led a recent study, published in *Cancer Immunology, Immunotherapy*, suggesting that a different type of viral vector may lead to better results. A vector is an agent that can introduce something, such as a gene or vaccine, into the body. The researchers found that vectors derived from persistent viruses—those that can't be cleared from the host—may offer better antitumor immunity than those from short-lived acute viruses.

**Vectors derived from persistent viruses may offer better immunity.**

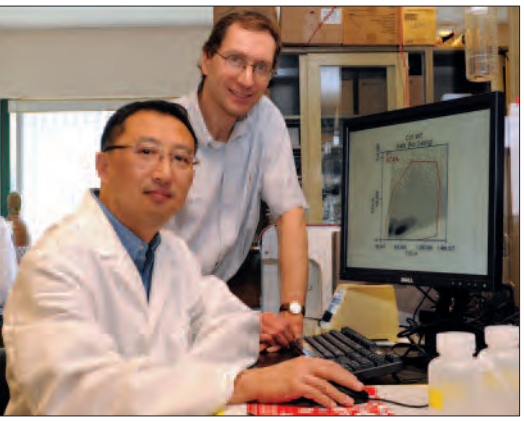
**Cells:** The immune system often overlooks tumor cells because they appear similar to normal, healthy cells. But the immune system will recognize a viral vector as a foreign object and so mount an immune response. Scientists can add proteins specific to tumor cells to the modified virus and then inject the vector into the host. The hope is that when immune cells called T cells are activated against the virus, they learn to recognize the tumor-cell proteins, leading to an attack on the tumor along with the virus.

**Virus:** Usherwood previously found that T cells act differently depending on whether the vector was derived from an acute or persistent virus. He hypothesized that the immune response induced by vectors from persistent viruses could provide superior tumor protection. "The logic behind their approach is that the persistent virus will provide continual reminders of the tumor's identity to the host," says Timothy Bullock, Ph.D., a University of Virginia immunologist not involved in Usherwood's study.

The DMS team—including Mary Jo Turk, Ph.D., and research assistant Weijun Zhang—engineered melanoma tumor cells to express short peptides derived from a specific virus. This created an artificial target for the T cells. After exposing mice to the tumor cells, the researchers infected some of the mice with an acute version of the virus and other mice with a persistent version to see which produced the more effective T cell response.

The persistent virus induced a stronger response, including greater production of granzyme B, a protein that plays a key role in destroying tumor cells. Bullock calls it "provocative data suggesting that more effective cancer vaccines may be obtained by using recombinant viruses that are not actually cleared by the host."

Usherwood's team is now trying to identify which viral vectors would be safest for use in humans. They also hope to use a mouse model that is capable of spontaneously developing tumors. This would provide a more accurate representation of cancer in humans—and a tougher test for persistent viral vectors. KRUPA PATEL



JON GILBERT FOX

**Usherwood, right, and Zhang, left, took a different approach to developing antitumor viral vectors.**

## Mental images

Treatment decisions made by people with severe mental illness may be strongly influenced by their ethnicity and race, concluded a study led by Elizabeth Carpenter-Song, Ph.D. The researchers found that mental-health patients of differing ethnic backgrounds view their conditions, and mental health services, differently. They wrote in *Transcultural Psychiatry* that African-American and Latino patients were more likely to hold "non-biomedical interpretations" of mental illness and to be "critical of mental health services." By contrast, Euro-American patients held "disease-oriented" views of their conditions and were more likely to seek mental-health treatment.

## Millions more

When a team of DMS researchers examined trends in Americans' use of chiropractic care, they found that chiropractors have attracted millions of new patients since the late 1990s. Inflation-adjusted expenditures on chiropracty rose from $3.8 billion in 1997 to $5.9 billion in 2006, they reported in *Health Services Research*. The surge was due to a 57% increase in the overall number of patients, from 7.7 million in 2000 to 12.1 million in 2003. From 2003 to 2006, however, the number of chiropractic patients remained relatively stable. ■