

Cancer

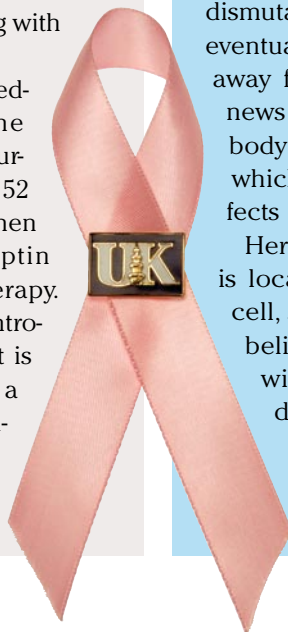
Breast Cancer Breakthrough

Here's a good-news story about an extremely aggressive form of cancer, starring 4,000 women nationwide. These women participated in a clinical trial of a drug called Herceptin, research sponsored by the National Cancer Institute. At issue was the drug's effectiveness in reducing the spread of HER-2 positive breast cancer.

Compared to other types of breast cancer, HER-2 is more likely to metastasize to other organs—even in spite of chemotherapy—and to recur more often after treatment. Of the more than 2,100 women who will be diagnosed with breast cancer this year, 20 to 25 percent will get the bad news that they have this virulent type of cancer.

The trials included women whose HER-2 cancer had not yet spread to other organs, but whose cancers did show a strong tendency to spread. Half of the patients received chemotherapy only, while half received Herceptin along with chemotherapy.

The results were incredibly encouraging: The number of cases of recurrent breast cancer was 52 percent less in the women who received Herceptin along with chemotherapy. "It was absolutely incontrovertible that this benefit is real—this drug can be a life-saver," says UK cancer researcher Edward Romond, who headed up this trial.



Less Toxic Cancer Treatment

People facing several bouts of radiation and chemotherapy to treat cancer realize they may get pretty sick before they can get well. But research conducted by a UK toxicologist suggests that by incorporating a natural body enzyme into existing treatments, the result might be a lot less toxic for patients.

Daret St. Clair, a researcher at the UK Chandler Medical Center, is continuing to study the antioxidant enzyme manganese superoxide dismutase (MnSOD), which may suppress the growth and even eventually help eradicate the existence of cancer. "We're still far away from a non-toxic drug that can stop cancer, but the good news is that this enzyme we've been working with is a natural body enzyme—it is essential for the survival of normal tissue, which makes it an important tool for the fight against toxic effects of other anti-cancer drugs," St. Clair says.

Her previous research has shown that this enzyme, which is located in the mitochondria (the energy producers) of the cell, slows the growth of cancer. Antioxidants like MnSOD are believed to offer protection against free radicals, molecules with unpaired electrons that move through the body and destroy proteins, carbohydrates, lipids, and nucleic acids.

"Our lab is one of the two leading groups in the country with this particular focus on cancer research," St. Clair adds.

Mapping Adult Stem Cell Growth

A discovery in stem cell research may mean good news for cancer patients undergoing chemotherapy and bone marrow transplantation.

Gary Van Zant, a professor of internal medicine in the UK College of Medicine, and Ying Liang, a postdoctoral scholar in internal medicine, have genetically mapped and identified a stem cell gene and its protein product, Laxetin. This is the first time such a complete study on a stem cell gene has been done.

This particular gene is important because it helps regulate the number of adult stem cells in the body, particularly in bone marrow. Researchers hope the gene, along with Latexin, can be used clinically for ramping up the stem cell count in certain types of cancer patients.

One big obstacle chemotherapy patients face is stem cell loss after treatments. This loss limits the dosage amount and types of chemotherapy that can be given. But if Latexin were used to increase the stem cell count, patients would be able to receive increased doses of chemotherapy and recover more quickly. Increased stem cell counts also would be valuable during bone marrow transplants, where stem cell count is critical in helping a patient recover from cancer.

“We’re thinking about cancer in a big way,” says Van Zant, who also serves as clinical director of the stem cell processing lab at UK. “This is a great example of translational research—from the most basic type of genetic research all the way to possible treatments for patients.”

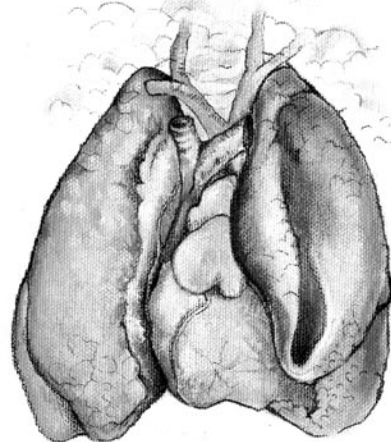


Early Detection of Lung Cancer

Here’s a Number 1 not to be proud of: Kentucky has the highest incidence of and death rate from lung cancer in the nation.

A UK team of lung cancer researchers hopes to cut into these grim statistics with a new test that looks at the immune system’s response to the most common type of lung cancer. This test accurately predicts the disease years before detection by CT scans, according to a recent study by Edward Hirschowitz and Li Zhong (pulmonary and critical care medicine). Such early detection of non-small-cell lung cancer could significantly improve a patient’s chance of survival.

“Cancerous cells express protein antigens that are alien to the body, leading the immune system to produce antibodies that attack the antigens,” says Hirschowitz. “Such antibodies can be used as biologic markers for tumors, meaning the presence of the antibodies might signal the presence of cancer cells. We looked at corresponding antibodies that recognize these



3,100 Kentuckians die of lung cancer each year

antigens in the early stages and use them as markers for lung cancer.” Taking this approach, the researchers were able to correctly identify nearly 90 percent of the cancer cases with very few false positives. By comparison, CT screening has a false-positive rate of more than 40 percent.

Then, using the five most predictive cancer markers, the researchers tested 102 blood samples drawn from participants. The UK team found that the presence and amount of the five antibodies in the blood predicted lung cancer with about 85 percent accuracy.

“Our hope is that in five years, this test will be available for doctors to use on high-risk patients,” Zhong says.

Revolutionizing Cancer Treatment

It’s a little-known fact that your original cancer probably won’t kill you. Cancer is much more dangerous when it moves to other parts of the body and sets up camp, and it’s this form of the disease that a team of medical researchers at UK has been fighting—with great success.

In three related studies, this team has done nothing less than revolutionize the treatment of metastasized cancers—tumors that travel to other parts of the body—to extend the life and the quality of life for patients worldwide. The research group through the years has included an all-star lineup led by Phillip Tibbs and Roy Patchell in neurosurgery.

In the most recent study, 101 patients with spinal cord compression caused by metastatic cancer were randomized into two groups: surgery followed by radiotherapy or radiotherapy alone. Radiotherapy is conventional radiation therapy which uses beams that can cover large areas. The trial yielded excellent news. Significantly more patients in the surgery group were able to walk after treatment (84 percent compared to 57 percent).

This study was preceded by two landmark studies of brain metastases. One trial showed conclusively the importance of surgery for patients with a metastasized brain tumor. The second study established that radiation in combination with surgery was a useful treatment and clearly did prevent recurrence of tumors.

