SCIENCE BRIEFS

Cells provide early warning signals

NEWPORT BEACH, Calif. (AP) — A new test that detects the genetic footprints of cancer cells gives an earlier warning when cancer has spread beyond the prostate, researchers say.

It could indicate which newly diagnosed patients should be treated right away to suppress cancer outside the prostate, and maybe spare some men from having unnecessary surgery, said Dr. Anna Ferrari of the Mount Sinai School of Medicine in New York.

Prostate cancer is the second leading cancer killer in American men, with an expected death toll this year of 39,200. Some 184,500 cases are expected to be diagnosed this year.

If it is caught while confined to the prostate, it can be cured by removing or irradiating the prostate.

Currently, doctors must look at nearby lymph nodes under a microscope to see if there is any sign that cancer has spread there. If not, the cancer is considered to be localized.

The problem is the cancer can escape the prostate and come back in about a third of those cases, appearing in such places as the lymph nodes or bones.

"We're missing here a great deal of disease that we cannot see," Ferrari, an oncologist, said in an interview before describing the new test Sunday at a conference presented by the American Cancer Society.

Prostate experts said the test could become a useful guide to treatment, if it turns out to predict which patients are vulnerable to relapse.

UT researchers use gene therapy on canc

AUSTIN (AP) — Two University of Texas microbiology professors think they have a better way to treat breast cancer tumors than cutting, burning or poisoning them with chemotherapy.

Jaquelin Dudley and Shelly Payne are banking on an experimental treatment based on gene therapy and two infectious organisms: a rare retrovirus that causes mammary tumors in some mice, and a common bacterium that causes dysentery in people.

"It wouldn't require any injection," Dudley said of the treatment.

She and Payne have received a $170,000 state grant to explore their theory in lab experiments with mice.

"You would eat it with a little bit of sugar," Dudley told the *Austin American-Statesman* for a story in Sunday's editions.

Gene therapy tries to cure diseases at their roots by replacing or modifying the abnormal genes that cause or contribute to cancers and other conditions.

There are hundreds of gene-therapy trials under way around the world, but few use bacteria, if any.

Retroviruses cause illnesses by copying part of their DNA into the genetic code of a host cell. People and animals get ill when the host cell's DNA prints out multiple copies of the invading organism.

The theory behind gene therapy is that once the harmful parts of the retrovirus are disabled, the healthy genes it delivers to cells will be copied into the host cell's genetic code, curing the disease.

However, there are problems, such as how to get enough copies of a healthy gene into the right places in a cell's DNA to be effective without triggering a counterattack of antibodies from the immune system.

Dudley and Payne say they see hope of attacking breast cancer with a retrovirus called mouse mammary tumor virus, which goes straight from a female mouse's stomach to the cells of its mammary glands.

Besides uncertainty over whether the virus will carry a healthy gene to a woman's mammary glands, the researchers also have to find a way of sneaking it past the digestive chemicals in her stomach.

The virus would not survive in the stomach of even an adult mouse, so nature has arranged for it to be passed from one generation of mice to another in mother's milk. Once in an infant mouse's immature stomach, the virus hitches a ride to the mammary glands on white blood cells.

> **"It (the treatment) wouldn't require any injections."**
> Jaquelin Dudley
> UT researcher

Dudley and Payne hope to evade the chemical roadblock by tucking the gene-carrying virus inside a shigella bacterium. Shigella has strong cell walls and other protective mechanisms to help it survive stomach chemicals.

The bacterium would get inside intestinal cells, then die, letting the virus genes take over, said Payne, former chair of the UT microbiology department.

The first step, in experime take several months to comple if they can get the virus to deli genes to the mammary gland mice.

Their first four attempts failed shigella proved unable to sur adult mouse's stomach long enou virus to get into white blood cel strengthening the shigella with to bolster its cell walls, the resea cessfully infected a dozen labora with the bacterium-virus delive and are waiting to see the result

Eventually, they want to try usi virus to make other deliveries to th ry glands, such as toxic chemicals cer tumors or a set of genes to st immune system to do the job.

If the idea proves effective in ley and Payne plan to take thei the National Institutes of Hea nancing of preliminary trials with breast cancer.

"It would just be so simple if it w Dudley said.

Robots to provide doctors helping hand on battlefi

BETHESDA, Md. (AP) — It looks like a giant bionic fly that has found work as a tailor.

It looms over a small table, moving its black metal arms and silver pincers quickly and silently. Elbows spread wide and camera-lens eyes unblinking, it deftly sews two rubber hoses together.

About 12 feet away, Army Lt. Col. Christoph Kaufmann leans forward in his chair, peering down into a large black box. Below, he holds scissorlike handles at the end of two mechanical arms. He too makes sewing motions.

In fact, every move of his hands is mimicked instantly by the bionic fly.

It's a little like that scene in "The Wizard of Oz" when Toto pulls back the curtain to reveal the real wizard. And the reality here sounds just as fantastic: The device Kaufmann is demonstrating may one day let surgeons behind the battle lines operate on soldiers at the front.

The bionic fly is called TeSS, for Telepresence Surgery System. The Pentagon has spent about $3 million for its development, and now it's going to find out what TeSS can do.

Within the next few months, Kaufmann and his military colleagues at the Uniformed Services University of the Health Sciences will start putting it to the test, operating on dummies, cadavers and anesthetized animals. And in two or three years, they will have a better idea how useful it could be on the battlefield.

The idea is to do surgery at the front without putting surgeons in the line of fire. Still, it is clear that TeSS will not replace standard surgical care behind the lines, said Kaufmann, a trauma surgeon who sewed up soldiers in Operation Desert Storm.

Soldiers with simple wounds w be evacuated. If an explosion blo a leg, a medic will still apply a to get the soldier to human surgeon

But on some future battlefie whose lung has collapsed might b an armored vehicle, where a su robot slips a tube into his ches whose face is so badly damage breathe, might inhale again after a hole in his throat.

THE BATTALION

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