Pennington to patent treatment

By NED RANDOLPH

A research team at LSU's Pennington Biomedical Research Center will be issued a patent today for a new treatment to fight the most common forms of cancer — prostate, breast, ovarian and testicular.

Dr. William Hansel, who joined Pennington in 1990 after retiring from Cornell University, says the treatment works on laboratory mice by killing cancerous tumors and leaving normal cells unaffected.

The new treatment also eradicates metastaticized cells. Metastaticized cells are cells which spread throughout the body and cannot be controlled by present treatment, resulting in death, Hansel said.

The only side effect of the new treatment is that the subjects become infertile while they are taking it. It's not known if the infertility is a permanent side effect, he said.

The new treatment is a conjugate, one drug made up of two parts, lytic peptide-ligand. Researchers started their work in 1996 and applied for the patent in 1998, Hansel said.

The team, which includes Drs. Carola Leuschner, Marek Bogacki and Fred Enright, will begin clinical trials on humans as soon as their grant applications are approved, Hansel said.

The LSU Agricultural Center is also involved in the research. The first phase of human testing should take about a year. If the tests are successful, a new drug is probably five years away, said Hansel, who is 85.

"This is unique, this kind of treatment," he said. "Other treatments work only on proliferating (rapidly-dividing) cells."

Proliferating cells can become metastaticized cells, he said.

Cancers are all different. A tumor may remain confined to the affected organ. Its cells may metastasize and lie dormant, until they mysteriously start multiplying. Or they can aggressively spread from the beginning into lymph nodes, bones and the brain, killing the patient quickly.

"That's the cruelty of the disease," Leuschner said. "There are so many kinds of cancer."

Hansel, who spent 44 years advancing reproductive biology at Cornell in Ithaca, N.Y., said his cancer research began in earnest in 1996 after a group of scientists in Poland discovered receptors on the surface of certain cancer cells.

At the time, Hansel's wife was dying of ovarian cancer and enduring the side-effects of the treatment. She was diagnosed in time to eliminate the primary tumor, only to discover later that its cells had metastasized.

"They thought they got it. She pretty much led six months of a normal life," Hansel said.
Dr. Carola Leuschner, left, and William Hansel, researchers at LSU's Pennington Biomedical Research Center, are working on a drug that attacks cancer cells and kills them in lab mice.

Cancer

"Certainly her death reinforced my determination."

Cancer relapses commonly occur when cells from the primary tumor spread undetected. In one case, Hansel said, a woman developed lung cancer about a decade after she defeated colon cancer.

Doctors found a metastasized colon cell in the woman's lung. It "had been sitting dormant for 12 years," he said.

According to Hansel, here's how the new treatment works:

Scientists attach a cell-killing peptide to certain hormones that bind specifically to cancer cell membranes found in the prostate, breasts, ovaries and testes.

In 1996, researchers learned that the surfaces of prostate, breast, ovarian and testicular cancer cells have receptor molecules that bind to the two major reproductive hormones, luteinizing hormone in men and estrogen in women. As these hormones connect to the cancer cells, they can deliver the lethal peptides attached to them. Meanwhile, the surrounding normal tissue is unaffected.

Scientists can "pre-treat" patients with the reproductive hormones which would create more receptors for the cancer-killing peptides to target.

The reproductive hormones spur ovulation in females and sperm production in males.

The surrounding tissues in the breasts and prostate do not have the hormone receptors for the peptides to attach to and attack. Hansel said the only other place where the hormone receptors are located in significant numbers are the ovaries and the testes.

The patient is spared the sickness of the treatment, since the small peptide molecules dissolve immediately after killing their targeted cells. They are metabolized immediately by the body, Leuschner said. "There's no hair loss and the immune system stays intact," she said. "Current cancer drugs go after any proliferating cells — which include hair follicles and the immune system."

The new treatment's only side effect is that in animals, the subjects become infertile because the cells in the testis and ovaries have hormonal receptors which will also receive the cancer-killing peptides. The peptides also bind to healthy cells in the testes and ovaries enough to block reproduction, Hansel said.

"We don't know how long it's going to take them to recover," he said. "We have those experiments under way. We suspect that it won't be permanent, but we're not quite sure."

After talking to the local chapter of the American Cancer Society, Hansel and Leuschner said they received a warm reception from its members, some of whom are terminal.

Hansel said his team hopes to begin the first phase of human testing as soon as they can raise about $4 million.

Participants at LSU Medical Center in New Orleans will receive a two-week treatment and then be monitored through the end of the trial.

Trials two and three will take longer and require 10 times the funding. By then, Hansel said, he hopes to have sold the rights to a drug company. That move will pay for the tests needed for U.S. Food and Drug Administration approval. Royalties should be substantial, not only for Pennington and LSU, which jointly employ Hansel, but also for his team.

"It's going to be a big advance over the current treatment," Hansel said. "Or it can supplement existing treatments with the ability to kill metastasized cells."

The group's work to date has been financed mainly by grants from the Gordon and Mary Cain Foundation and the U.S. Department of Defense.

Hansel's team is the only U.S. team to publish on this treatment. Other labs, in Poland and Finland, are collaborating with Hansel. "We put the patent in after the first clear-cut results in the lab (in 1998)," Hansel said. Since then, the team has published 10 papers in scientific journals.