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U of L touts cancer breakthrough

Researchers' vaccine stops disease in mice

By Deborah Yetter

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The Courier-Journal

Two University of Louisville researchers have developed a vaccine that prevents lung cancer in mice, a treatment they say could lead to a vaccine for humans against lung and other forms of cancer.

John W. Eaton, one of the researchers, presented the findings today at an international cancer conference in Prague, Czech Republic.

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Eaton, deputy director of UofL's James Graham Brown Cancer Center, said that the results in mice are promising but that much more research is needed — particularly into whether the results will translate to humans.

"Cancer has been prevented and even cured in mice hundreds of times," he said today, according to the European Organisation



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Robert Mitchell, left, and John W. Eaton of the Brown cancer center have developed a vaccine that prevents lung cancer in mice. Much more research is needed to determine human applications, they said. (Photos by Kylene Lloyd, The Courier-Journal)





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results from their work.

Conference organizers singled out the paper as one of 10 from among the 800 to be highlighted as of particular interest to the media.

Also among the 10 papers is one by another UofL cancer researcher, Dr. Jason Chesney. He is scheduled to present research from a separate study tomorrow.

UofL officials said having the work of two research teams selected speaks well of their efforts and the achievements of the Brown cancer center.

"This helps us get the recognition that we need," said Dr. Donald Miller, director of the cancer center.

Miller said the attention could help recruit researchers and make people realize that Louisville has a major cancer center at which they can obtain treatment rather than going out of town.

The center currently has more than 90 clinical trials under way for various cancer treatments, he said.

A top official with the American Cancer Society described Eaton's work as "intriguing and interesting" but a long way from any practical application.

"It clearly is a very early step," said Dr. Len Lichtenfeld, deputy chief medical officer with the cancer society. "It's worthy of further investigation."

In an interview last week before he left for Prague, Eaton said the research team that developed the vaccine against lung cancer in mice has been working on the project for nearly four years.

The goal is to develop a vaccine that might protect people at risk of developing

for Research and Treatment of Cancer, sponsor of this week's conference.

Eaton, 65, also predicted that "by the time this is tried in humans, I will be pushing up daisies" because of government rules on testing new drugs, according to a statement released by the conference.

But Eaton and colleague Robert Mitchell said they are excited by early



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Beatriz Rendon, lab manager where promising new cancer research has been conducted at the University of Louisville's James Graham Brown Cancer Center, worked with cultured cells recently.

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certain malignancies — such as prostate, breast, colon and lung cancer — by creating an immune response to the disease.

How it works

Eaton and Mitchell said their findings are based on injecting adult mice with mouse embryonic stem cells: basic cells isolated from a fertilized mouse embryo. The immune system of the adult mouse recognizes the stem cells as foreign and develops an immune response, they said.

"The mouse system fights it off like it would a tumor," Eaton said.

By doing so, it appears that the mouse develops an immunity to cancer tumors. This is important because without a vaccine, the body's immune system is less effective against actual tumors. That's because they grow very fast and are adept at concealing themselves from the immune system, the researchers said.

"The idea is to crank up the immune system," said Mitchell, 41, an assistant professor of biochemistry and molecular biology.

The researchers created the potential for lung cancer for mice two ways. In one group of mice, they implanted lung-cancer cells; in the other, they injected a carcinogen associated with smoking and a substance that causes lung inflammation.

Then both groups were injected with the vaccine before the mice actually developed any tumors.

The vaccine was about 80percent to 100percent effective in preventing tumors in the mice with the implanted cancer cells and about 60percent to 90percent effective in the mice exposed to carcinogens, Eaton said.

More work to do

The researchers said they now must figure out what exactly within the stem cells is causing the immune response and how it could be replicated for humans, which will take more work and more funding. The research has been supported by the cancer center and a state grant from the Kentucky Lung Cancer Research Program.

The injected mouse stem cells aren't themselves the agent that creates immunity. Rather, there are certain proteins within the stem cells that appear to trigger the response, Eaton said.

If the researchers can identify those proteins and determine a way to synthesize them, they could be on the way to creating a cancer vaccine, they said.

"We need to figure out how to take advantage of that and to carry it forward into humans," Mitchell said.



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As to when that could be, Eaton said, "I have no earthly idea."

Reporter Deborah Yetter can be reached at (502) 582-4228.



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