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Health/Science

Mice put cancer on ice?

Study of ordinary lab mice injected with white blood cells from cancer-resistant one held the disease at bay

Newsday Staff Writer

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Three years ago, scientists at Wake Forest University School of Medicine identified a mouse resistant to even the most aggressive cancers. These researchers now report they have prevented cancer in ordinary lab mice by injecting them with white blood cells from cancer-resistant mice bred from the original.

"We were surprised," said Dr. Zheng Cui, a co-investigator of the new finding that appears today in the Proceedings of the National Academy of Sciences. "The powerful resistance was transferred through the animal's white blood cells," which are immune system cells. Cui, Dr. Mark Willingham and colleagues found that the animal's innate immune system turns on to protect against cancer or to kill cancer that already exists.

BY JAMIE TALAN

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Using a strain of mice bred from their founder mouse -- resistant to most cancers -- the team is now hunting for genes that confer this protection. The initial findings have yet to be replicated by other labs, which are just gaining access to the animals.

Dr. Alan Houghton, a cancer researcher at Memorial Sloan-Kettering Cancer Center in Manhattan, observed that the research "nails it down to a cell of the immune system, and that is mediating this resistance. It may not get you closer to a gene, but it gets you closer to the mechanism."

The Wake Forest researchers are working with their university to make the novel mouse strain available to other scientists.

"The observation needs to be replicated and confirmed," Cui said. "If this turns out to be what we hope it is, it will be a gift to mankind."

Sloan's Houghton said many mouse models parallel the disease process in humans.

Cui and his team found a lone, cancer-resistant mouse by accident during a cancer study. They were injecting mice with sarcoma 180, an aggressive soft-tissue tumor. When one of the mice didn't develop cancer, they kept upping the ante, delivering more and more cancer cells. The mouse seemed resistant to cancer.

They dubbed the mouse SR/CR, for spontaneous and complete remission. It can be exposed to a large number of cancer cells, even at doses well beyond lethal. They have since cross-bred 3,000 of these cancer-resistant mice.

In the latest study, they took white blood cells from these mice and injected them into ordinary mice susceptible to developing one tumor or another. None got cancer.

Yong Chen, a professor of cancer biology at Wake Forest, was quite skeptical of the finding initially. "I wasn't sure what to make of it," Chen said. He had a mouse model for prostate cancer that mimicked the human condition and gave Cui

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a half dozen mice. The prostate cancer usually kills the animals within a year. Each was injected with white blood cells from the cancer-resistant mice. Two years later, four of the mice are still alive. One mouse died at 14 months, another at 17 months. "There was very little cancer present," Chen said. "It was like a scar. I had never seen anything like it." They died of something, but it wasn't cancer, he said of the two that died.

Two weeks ago, he asked for a new batch of mice. He wants to replicate these findings. Meanwhile, the university has already handed out the first batch of animals to investigators outside of Wake Forest. The cancer-resistant mice are at the Scripps Research Institute in La Jolla, Calif., the University of Michigan and Washington University in St. Louis.

"It's rather simple to show whether we are right," Cui said. "Give them the white blood cells, and they are either dead or alive. A live mouse is a live mouse."

One of the co-investigators on the paper is Dr. Lloyd Old, branch director of the Ludwig Institute for Cancer Research in Manhattan. Old saw Cui's slides in 2002 and was convinced he was on to something. They are now collaborating on other projects with the mice.

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