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Director of University of Michigan cancer center says targeting cancer stem cells is key to patient survival

By [Tom Henderson](#)

Dr. Max Wicha, the director of the **Comprehensive Cancer Center at the University of Michigan**, told an audience at the sixth annual World Stem Cell Summit Wednesday that current cancer therapies generally have been aimed at the wrong target and have inadvertently helped promote the growth of the cells that both cause cancer and its metastasis to other parts of the body.

Wicha said that traditional therapies have been aimed at all cells in a tumor, but researchers at UM have shown that cancer stem cells need to be targeted specifically.

He said that such targeted treatments are at least five years away from the marketplace.

As few as one percent of the cells in a tumor are cancer stem cells, and they are very resistant to chemotherapy and other treatments. Wicha said those are the only cancer cells capable of regenerating new cancer cells.

In one experiment, as few as 200 cancer stem cells caused tumors in mice. But the injection of as many as 20,000 other cancer cells created no tumors.

Worse, not only do stem cells survive treatments, but the dying cancer cells around them have an inflammatory reaction that both protects the stem cells and causes them to multiply.

"We've developed lots of treatments that shrink down tumors, but if stem cells are left intact, it's like the root of a plant that grows back," said Wicha.

"We've used wrong models to develop therapeutic agents. We got very good at shrinking tumors, but tumor shrinkage does not correlate well to patient survival," he said.

Wicha's center is involved either in ongoing **U.S. Food and Drug Administration**

trials or planning such trials to show that targeting cancer stem cells is safe and effective.

UM researchers were the first to identify cancer stem cells in breast cancer tumors in a work published in 2003.

A Phase I study to show it is safe to target cancer stem cells in patients with breast cancer, in collaboration with the **Baylor College of Medicine** in Houston and the **Dana Farber Cancer Institute** in Boston, was recently completed.

Wicha said that the study of 35 women, which began in 2006, showed that a drug made by **Merck**, called MK-0752 and first aimed at Alzheimer's patients, was safe. While the trial's purpose was to demonstrate safety, it also showed a significant reduction in stem cells in tumors.

He said Merck is now deciding how to proceed to formal Phase II trials to show efficacy and may decide to target a faster growing cancer such as pancreatic cancer in order to get quicker results and get to market faster.

Individual teams at UM's Comprehensive Cancer Center are focusing on how to attack stem cells therapies in a wide range of cancers, including leukemia and cancers of the skin, brain, colon, lung, prostate, ovary, bladder and adrenal gland.

The center is also involved in Phase I trials with California-based **OncoMed Pharmaceuticals Inc.**, a company that has licensed UM technology, and with the **Karmanos Cancer Institute**. Both studies target solid tumors and are not exclusive to breast cancer.

The OncoMed trial is nearly finished.

Wicha said Phase II trials take one to two years to plan and get FDA approval to proceed and another two years to run. If efficacy is shown during Phase II, larger Phase III trials are conducted.

"Within five years, we should have some answers one way or another, and possible approval," Wicha said of the various trials in progress or planned.

Wicha said he hopes to begin a Phase I trial in a month or two on patients with pancreatic cancer