



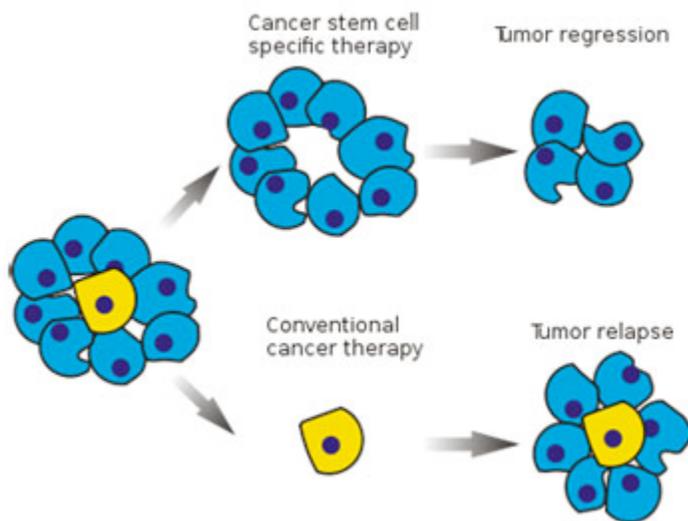
[News Blog](#) - September 23, 2009

Cancer stem cell research gains traction, tackles new targets

By Katherine Harmon

BALTIMORE—In the decades-long war on cancer, as of late, researchers had been making little progress in comparison to colleagues treating other conditions, such as cardiac or infectious diseases. "Cancer research has really plateaued out," [William Matsui](#), an associate professor of oncology at Johns Hopkins University's School of Medicine, said at the 2009 World Stem Cell Summit here on Tuesday. But pushing cancer stem cell research "gives us a novel way to study cancer," said Matsui, who also runs [a lab at the university's Sidney Kimmel Comprehensive Cancer Center](#).

Cancer and stem cells have had a fraught relationship—not in the least because of early concern that stem cell treatments could in fact spur on cancer through their encouragement of undifferentiated cell growth. But cancer stem cells themselves have gained a more solid toe-hold in the past several years as a potential new target for cancer research.



[Cancer stem cells](#)—or CSCs—are presumed to have similar capabilities as healthy stem cells: they can regenerate and differentiate into any cell that makes up the cancer. Such cells are [often blamed for relapses in patients](#) who by all other measures appear to have been cured. One of the large problems, however, has been in finding these cells. In some cancers, such as some leukemias, they are suspected to be only one cell in a million.

Cancer stem cells' persistence has given rise to the so-called dandelion theory of cancer treatment. Researchers and doctors have traditionally worked to obliterate the visible cancerous menace—the tumor, or dandelion weed, as it were. But as

anyone with a lawn may be well aware, hacking off the flower does little to stop the root—that is, the stem cell—from regenerating another attack later. So, posits [Richard Jones](#), also at the Sidney Kimmel Comparative Cancer Center, it's possible that effective drugs may have been abandoned because they were not creating quick, visible responses. Eliminating the root stem cells will cause the tumors to stop growing, but not right away, he explained at the summit.

Just last week, researchers at Harvard Medical School announced that a common diabetes drug, metformin, might in fact target [breast cancer stem cells](#). Their study, published online in *Cancer Research*, showed better outcomes for mice with the cancer when they were given a combination of the diabetes drug and traditional chemotherapy treatment.

Other research is trying to untangle the behavior of breast cancer stem cells that implant themselves in blood vessel walls with pernicious [microtentacles](#). Many would-be breast cancer cells get destroyed as they try to pass through too-small capillaries. Some, however, appear to have filament-like microtentacles, which allow them to latch onto the vessel walls rather than pass through and get broken up. A team at [the University of Maryland Greenebaum Cancer Center](#) has been studying these tentacled cells and testing different compounds to prohibit their growth.

The origins and full capacity of cancer stem cells, however, still remain largely unknown. Curious reports from outside the cancer research field have been trickling in, further obscuring the relationship between cancer and stem cells. Some researchers have described a phase in the reprogramming of adult induced pluripotent stem (iPS) cells in which the cells exhibit similar profiles to cancer cells. Others have reported that embryonic stem cells provided for research have arrived with chromosomal and genetic abnormalities that suggest they might have been on their way to becoming cancerous.

Despite recent advances in the identification—and targeting—of cancer stem cells, even those championing the research still refer to the pursuit as a hypothesis. Not everyone is convinced that cancer stem cells are ultimately to blame for many—if any—cancers. Matsui professes hope that the stem cell avenue will eventually suggest effective new treatments. And if it doesn't? He shrugs and says he supposes he'll take up another cause.

Image showing difference between traditional cancer treatment and cancer stem cell-targeted treatment courtesy of [Wikimedia Commons/Peter Znamenskiy](#)

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