

# Seeking Alpha

## Has the Future Already Arrived for ImmunoCellular Therapeutics?

*By Jason Chew  
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Scientific and pharmaceutical-industry veterans were abuzz last week after the World Cancer Stem Cells Summit with the belief that cancer stem cells (CSC) are the future of oncology research and drug development.

Academic heavy-hitters, including Robert Weinberg of MIT and founder of The Whitehead Institute, University of Toronto's Peter Dirks, and Harvard Medical School's Kornelia Polyak, joined industry leaders in showcasing their latest findings on what very well may be the root cause of cancer.

In brief, the CSC hypothesis is based on evidence that tumors—like the rest of our tissues—are caused by stem cells, which encode instructions for generating tumor cells that don't necessarily bear any resemblance to their creators. As a result, these CSCs may be immune to the treatments designed to target the tumors they create—and therefore are ready to cause relapse even when the tumor seems to have disappeared.

Says Dr. Weinberg,

The CSC hypothesis should provide a new way of targeting tumors since it should allow attacks on the CSCs, which may represent a major source, if not *the* major source of clinical relapse.

He along with Dr. Dirks presented groundbreaking research showing that radiation- and chemotherapy-resistant CSCs are indeed the only tumor cells capable of causing cancer growth and metastasis. Effective, long-term cancer treatment therefore requires new therapies designed specifically to target these CSCs.

The recent proliferation of CSC-targeting drugs in pharmaceutical pipelines signals the shift of the CSC hypothesis from the fringe to the mainstream of cancer-drug development. Major industry players such as Pfizer, BMS and Medimmune presented preclinical findings on a wide range of CSC-based products and technologies.

While most of these programs are still years away from entering the clinic, what these companies presented were very much their vision for the future of cancer-drug development. For one of the smaller and lesser-known presenting companies, however, the future is already here.

Los Angeles-based ImmunoCellular Therapeutics (IMUC: OB) provided an overview of its lead CSC-targeting vaccine program, which is starting a Phase II trial in glioblastoma multiforme (**GBM**). According to ImmunoCellular's President and CEO, Dr. Manish Singh, the company licensed the novel vaccine from Cedars-Sinai Medical Center, where it was developed based on research by preeminent CSC experts Dr. John Yu and noted brain surgeon Dr. Keith Black.

Similar to Dendreon's newly approved prostate-cancer vaccine Provenge, ImmunoCellular's vaccine, ICT-107, is made by harvesting special immune cells known as dendritic cells from the patient's body. These dendritic cells are then loaded with antigens that are highly specific to CSCs found in GBM tumors, effectively training them to seek out and destroy these CSCs once they are injected back into the patient's body.

Though it's still early, the Phase I data are highly encouraging.

"GBM is a notoriously progressive disease, with 90% of patients relapsing within 24 months," Dr. Singh explains. "In our Phase I study, about half of the patients remained in complete remission at two years, more than doubling the historical median disease-free survival time seen with the best standard of care."

Dr. Singh also notes that there have been no serious adverse events reported to date, being limited to fatigue and rash at the site of injection. The Phase II study, he says, will be a randomized, double-blinded, placebo-controlled trial in approximately 102 patients, which will be conducted at 15 leading centers in the US.

According to the CEO, ImmunoCellular Therapeutics is currently the only company focused exclusively on the development of CSC-targeting immunotherapies, with another "off-the-shelf" CSC vaccine expected to enter the clinic in the first half of next year.

**Disclosure:** I have no positions in any stocks mentioned, and no plans to initiate any positions within the next 72 hours.