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# PharmaCyte Biotech's Cell-in-a-Box Technology Makes Good Cancer Drugs Better

BONITA, CA -- (Marketwired) -- 07/13/15 -- While many biotech companies are working on new oncology drugs, what's often unappreciated about cancer treatments is how a key improvement in the way drugs are delivered can make a world of difference in their effectiveness. A young and enterprising biotechnology R&D firm called PharmaCyte Biotech (OTCQB: PMCB) understands this, and has not only embraced the benefit of improved dosing methods, but has developed a breakthrough that could change the way we altogether think about pharmaceuticals.

The technology is called Cell-in-a-Box<sup>®</sup>. Just as the trademarked name suggests, it's a way to encapsulate a variety of types of living cells in a tiny container -- a "box," so to speak -- that can be deposited by the dozens in an area of the body where they'll drive a therapeutic benefit. In fact, roughly the size of the head of a pin, these encapsulations can be surgically deposited without the patient even realizing they're there.

The possibilities of such an approach are virtually limitless, though PharmaCyte has decided to first focus on developing the technology as a means of using a drug called ifosfamide, or Ifex, to combat pancreatic cancer... a notoriously difficult cancer to treat.

Ifosfamide is recognized as an effective therapy for pancreatic cancer patients. The drug, however, is also known to frequently create harsh side effects that can become intolerable in and of themselves. For that reason, oncologists often prefer a combination of Abraxane<sup>®</sup>, from Celgene Corporation, with gemcitabine, from Eli Lilly, to treat the disease. Gemcitabine in combination with Tarceva, made by Roche Holding subsidiary Genentech, is also a preferred therapy.

Ifosfamide could still be a viable choice, however, were the dosing whittled down to levels that didn't create difficult side effects but also didn't hinder its effectiveness. That's where PharmaCyte's Cell-in-a-Box could change the complexion of not just the war on cancer, but of all medicine.

Many drugs have a relatively short half-life, particularly once put into a human body. A person's own immune system and chemistry can begin breaking down drug molecules almost immediately, destroying many of them before they ever reach their intended destination.

The solution in most cases is simply to up the dosage so enough of an intact drug will eventually arrive at the point of the disease. In cases where adverse side effects are significant though -- as they can be with ifosfamide -- bigger doses aren't a viable option.

Cell-in-a-Box solves that problem by activating ifosfamide, a prodrug, near the pancreas to ensure maximum effectiveness with minimal dosing.

The science may be simple, but it's also brilliant. Rather than injecting ifosfamide in its final, fragile form, an ifosfamide prodrug that's in a much tougher, durable form is injected into the pancreatic cancer patient. Then, rather than in the liver where many drugs are processed and activated, this prodrug is converted to an active form of ifosfamide in the bloodstream right at the site of the tumor as it passes over the Cell-in-a-Box capsules with the cell inside that are capable of activating this prodrug.

PharmaCyte Biotech has achieved compelling results with this targeted chemotherapy approach too.

In a phase 1/2 trial examining the benefit of the Cell-in-a-Box delivery of ifosfamide versus the results gemcitabine would be able to achieve alone, the Cell-in-a-Box approach improved the median survival time from 28 to 44 weeks. Equally impressive is the fact that the number of one-year survivors increased from 18 percent to 36 percent of the study's patients. Even more encouraging are the lack of side effects witnessed with the lower doses of ifosfamide that are used in this approach.

The company reports it's aiming to begin phase 2b clinical trials of Cell-in-a-Box in conjunction with low doses of ifosfamide in Australia sometime in the third quarter of this year, which will compare it to the combination of Abraxane plus gemcitabine.

Pancreatic cancer is just the beginning, however. PharmaCyte is looking to develop a similar approach as a treatment for brain tumors, and the company is even aiming to encapsulate insulin-producing cells that could offer a breakthrough solution for type 1 diabetics.

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