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PharmaCyte Biotech Uses "Artificial Liver" to Treat Advanced Pancreatic Cancer

NEW YORK, NY -- (Marketwired) -- 07/07/16 -- PharmaCyte Biotech's (OTCQB: PMCB) signature live-cell encapsulation technology, Cell-in-a-Box®, is being used in treatments for both cancer and diabetes. For diabetes, the company's therapy, which is made up of pinhead-sized, porous capsules filled with insulin producing cells, will create an "artificial pancreas" for type 1 diabetics and insulin-dependent type 2 diabetics that no longer produce their own insulin. Meanwhile, for cancer, the company's therapy is made up of those same pinhead-sized, porous capsules; however, for advanced pancreatic cancer, they're filled with genetically modified cells that act as a type of "artificial liver."

First things first, PharmaCyte's Cell-in-a-Box® is not a drug delivery system. There are no drugs encapsulated inside the porous capsules for any of its treatments. Instead, for pancreatic cancer, which we will focus on today, the capsules are filled with about 10,000 live cells that are capable of converting an inactive chemotherapy drug (ifosfamide) into its active cancer-killing form -- just as the enzyme system in a patient's liver would normally do.

Keep in mind that because the chemotherapy drug ifosfamide is a prodrug or an inactive drug, it can travel all over the body and have no effect whatsoever until it is activated in the liver. Knowing that, PharmaCyte is, in a way, moving the "normal" conversion site (the patient's liver) of that inactive drug closer to the cancerous tumor by using Cell-in-a-Box® capsules and the live cells inside them to do the job of the patient's liver or to act as an "artificial liver."

So how does the treatment work and why is it important to move the conversion site closer to the pancreatic tumor?

First, we will tackle how PharmaCyte's therapy works.

The encapsulated live cells (Cell-in-a-Box® capsules) are placed as close to the patient's cancerous tumor as possible. Once implanted, ifosfamide, the aforementioned chemotherapy drug that needs to be activated in the body, is given to the patient intravenously at one-third the normal dose. The ifosfamide is then carried by the circulatory system to where the encapsulated cells have been placed. When the ifosfamide, which is normally activated in the liver, comes in contact with the encapsulated live cells in the Cell-in-a-Box® capsules, the chemotherapy drug is activated into its cancer-killing form right at the site of the cancer.

This is "targeted chemotherapy" in the truest sense, and the company's therapy has proven effective and safe to use in past clinical trials. This is how PharmaCyte will use its therapy in an upcoming Phase 2b clinical trial, so now let's discuss why it's important to move the drug activation site closer to the pancreatic tumor in the first place.

There are actually a number of reasons to move the activation site closer to the tumor. We'll start with the chemotherapy drug itself. Ifosfamide, when activated, has a very short half-life (time before it decays and no longer offers any effect), so by using the cells inside the Cell-in-a-Box® capsules to activate the drug at the site of the tumor, ifosfamide can immediately be the most effective when it's the most potent before dying off minutes later.

Without a treatment like PharmaCyte's, ifosfamide would be given to the patient intravenously and then activated "normally" in the liver, the activated drug would then affect tissues and organs other than the pancreas, and by the time it reached the pancreas, it undoubtedly would have lost much of its effectiveness. So, this, of course, means to be effective against a pancreatic tumor when the Cell-in-a-Box® capsules are not used, a large dose of the drug has to be administered.

Using ifosfamide in such large doses has proven to be damaging for tissues and organs including the patient's liver, and because the activated drug would come in contact with such other organs and good cells throughout the body on its way to the pancreas, the side effects would be intolerable; in fact, this is known to be the case.

By moving the conversion site as close to the tumor as possible, PharmaCyte is able to give a much smaller dose of the chemotherapy drug (one-third the normal dose), which patients are able to tolerate, and because of the smaller dose, the treatment can be administered without any side effects from the chemotherapy.

That's right -- chemotherapy without any side effects!

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For more information: www.stockmarketmediagroup.com.

Contact:

Stock Market Media Group
info@stockmarketmediagroup.com

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