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PharmaCyte Biotech Has Only Scratched the Surface With Its Cell-in-a-Box(R) Technology

BONITA, CA -- (Marketwired) -- 08/17/15 -- PharmaCyte Biotech Inc.(OTCQB: PMCB) has made a name for itself with the company's potentially game-changing pancreatic cancer treatment, and also as the name behind what could arguably be seen as a cure for type 1 diabetes. What's been largely unsaid about PharmaCyte Biotech, however, is that the same underlying technology behind its Phase 2b pancreatic cancer trial and its preclinical work in the field of type 1 diabetes is a technology with almost limitless applications within the world of medicine.

The star of the show, so to speak, is PharmaCyte's signature live-cell encapsulation technology, Cell-in-a-Box®. The patented technology is a means of encapsulating living cells in a protective shell that allows those cells to produce and deliver specific enzymes, hormones like insulin, etc., to perform a specific role within the human body. The capsules containing the live cells are about the size of the head of a pin and can be placed, by the hundreds, within the body wherever they will be the most effective in their designated role.

As a means of treating pancreatic cancer, Cell-in-a-Box capsules encase cells engineered to produce a P450 enzyme, which converts the prodrug ifosfamide into its active, cancer-killing form.

The benefit of this approach is where the activation occurs.

Though ifosfamide is a powerful anti-cancer agent, it's actually a relatively fragile molecule once in blood plasma. If processed/converted in the liver as is usually the case, the bulk of it never makes it to the pancreatic tumor... near the "last stop" in the human circulatory system. By placing the cells capable of activating ifosfamide right at the site of the tumor, the anticancer drug isn't activated until the last possible moment, leading to maximum effectiveness with minimal dosing of the drug. Through the handy work of an interventional radiologist, the capsules are guided through a vein in the leg or groin to be placed as close as possible to the cancerous tumor in a person with pancreatic cancer.

As for type 1 diabetes, the solution is even simpler... encapsulate cells that produce insulin "on demand."

The concept works because of the Cell-in-a-Box polymer shell that protects the insulin-producing cells inside.

It's as much of a process as it is a product. Two propriety polymers are necessary. One is mixed with specific live cells, and using a droplet machine, this mixture is dropped into the other polymer where the two components create a tough cellulose shell. This porous shell allows nutrients to get to the living cells inside the capsules, but more important, allows

those cells to produce and emit a desired chemical like the aforementioned P450 enzyme or insulin. Perhaps most important of all, however, is that the Cell-in-a-Box shell doesn't allow a patient's own immune system to attack and kill the living cells within the encapsulation.

While PharmaCyte Biotech has made a tremendous amount of headway on the pancreatic cancer front (Cell-in-a-Box in conjunction with the prodrug ifosfamide, which is now in Phase 2b clinical trials), investors have to be excited about the potential to “cure” diabetes by creating what would essentially be an “artificial pancreas.” But, investors can also get excited about the versatility of the Cell-in-a-Box platform. There's no limit to the medical application of the technology.

To that end, PharmaCyte Biotech is already examining the use of the biotechnology as a means to treat brain tumors and breast cancer.

On the breast cancer front, the potential for the localized creation of ifosfamide is particularly compelling since the vast majority of the preferred treatments for this form of cancer utilize a drug called cyclophosphamide, which just happens to be a "sister" drug to ifosfamide. In fact, the P450 enzyme that activates ifosfamide will also activate cyclophosphamide, implying that PharmaCyte may be able to make a good cancer treatment an even better one.

As for brain cancer, the company is exploring the use of Cannabis, which is already known to have an anticancerous effect. PharmaCyte can make this anticancerous effect even stronger using Cell-in-a-Box while simultaneously minimizing side effects by only using the minimal amount of the necessary drug right at the site of a tumor.

Any brain tumor or breast cancer therapies from PharmaCyte are still years away. But, the fact that three distinct forms of cancer, in addition to type 1 diabetes, are already on the radar using the same basic technology speaks volumes about that technology's potential.

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