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New Larazotide Acetate Drug in Clinical Trials offering Hope in Treating Celiac Disease and Novel Oral Small Molecule Therapeutic Is making its way through Clinical Trials for Ulcerative Colitis

Chris Prior, PhD
Chief Executive Officer

Innovate Biopharmaceuticals, Inc.
www.innovatebiopharma.com

Interview conducted by:
Lynn Fosse, Senior Editor
CEOCFO Magazine

"We are a biopharmaceutical product development company dedicated to reducing debilitating abdominal symptoms of the GI tract thus enhancing quality of life in large patient populations. We have late stage clinical assets that could reach approval 2018/2019 to treat serious unmet needs."- Chris Prior, PhD

CEOCFO: ***Dr. Prior, what is the basic vision behind Innovate Biopharmaceuticals?***
Dr. Prior: We are a biopharmaceutical product development company dedicated to reducing debilitating abdominal symptoms of the GI tract thus enhancing quality of life in large patient populations. We have late stage clinical assets that could reach approval 2018/2019 to treat serious unmet needs. Our lead product is a Phase III ready program to treat Celiac disease. Despite being on a gluten free diet many patients still suffer socially debilitating symptoms like bloating, abdominal pain, diarrhea, gas etc. and, in these cases, there are no other treatment options when gluten free food is not helping. We have a second product that is Phase II ready, to treat mild to moderate ulcerative colitis. The product has a better delivery feature to the diseased area of the distal colon compared to the competing drugs and is the only liquid oral formulation, which is important to children and the aging. Also, our product could ultimately avoid the need for patients to go on steroids.

CEOCFO: ***Would you tell us what Celiac disease is and how you are addressing it in a way that has not been done?***
Dr. Prior: First of all, we have all heard that expression of "leaky gut". What that means is that the intestinal wall becomes very permeable and becomes vulnerable to undesirable substances crossing over the gut wall into the circulation and triggering disease states. This could be antigens from bacteria, viruses or gluten fragments derived from ingesting wheat, barley or rye products. In the case of celiac disease the ability of gluten fragments to penetrate the wall of the gut inducing an autoimmune response that triggers destruction of the intestinal wall and this leads to the serious symptoms. We have the only drug with a mechanism of action to reduce permeability of the gut and exclude uptake of the gluten fragments. This is mediated by correcting the ability of tight junctions, located between epithelial cells, to close properly.

CEOCFO: ***What is the name of what you have developed? Why and how does it work?***
Dr. Prior: The name of the product is Larazotide Acetate or INN-202. It is a natural eight amino acid peptide. It binds to a surface receptor on the surface of the intestinal wall. It does not enter the circulatory system. It is an absolutely safe product. It stays on the inside of the intestine and it restores the closing of the tight junctions and excludes the uptake of gluten fragments that causes the celiac disease.

CEOCFO: ***How does it restore it? Why does it work? What is actually happening in the body?***
Dr. Prior: Gluten binds a target receptor that then triggers a signaling pathway that causes structural rearrangements of the myosin actin fibers between cells. Myosin is very much a structure of muscle tissue, so these fibers hold the tight junctions in place. Through the signaling pathway gluten causes the disruption of these fibers that then pull apart the tight junctions rendering leakiness in the gut wall. Our drug, Larazotide Acetate, reverses that process. It blocks that signally pathway, allows the myosin actin fibers to come back into a conformation that allows the tight junctions to close properly. Mechanistically, at the molecular level, there is phosphorylation pathway that causes the disruption of these fibers and our peptide reverses that phosphorylation pathway.

CEOCFO: ***Would you tell us a about the market for a product that treats celiac disease?***
Dr. Prior: There are approximately three million Americans with celiac disease and there is a formal well defined series of diagnostic tests involving genetic testing and measuring certain antibody levels. There are about seven hundred and fifty thousand patients who remain symptomatic despite adhering to a gluten free diet. The problem is that gluten free foods are not actually gluten free. They contain trace amounts of gluten. It is these trace amounts that trigger symptoms in patients who are particularly intolerant of gluten fragments. So what is our product and how does it work? Our drug is contained in a capsule that is taken fifteen minutes before you eat, prior to breakfast lunch and dinner. That allows the capsule time to reach the small intestine and shut down the tight junctions for about two hours which is plenty of time before the arrival of food. Gluten fragments are excluded and simply pass out of the body. The capsule is very small and convenient for children. We believe the market is potentially larger than the target population of 750,000 because celiac patients need a drug to improve flexibility in their lives. When people travel it is difficult to access gluten free food. The total celiac population is three million in the US, about three and a half million in Europe and total worldwide is over twenty million. It is a very significant market especially if larger patient populations want to improve flexibility in their life styles when unable to access gluten free food.

CEOCFO: ***Are there any potential side effects?***
Dr. Prior: No. This is a very important question! The drug has been administered to a total of about eight hundred and forty patients. We have completed four Phase II trials. The last one was in three hundred and fifty patients. The side affect profile is the same as the placebo. The reason for this is well understood and that is because the drug stays in the intestine and is rapidly degraded and does not cross over into the circulation. There is no immunogenicity. There are absolutely no safety issues whatsoever. Therefore, we believe the risk to safety ratio for treating large patient populations on a lifetime chronic basis is really in everyone's favor.

CEOCFO: ***Would you tell us about the second drug you are working on?***
Dr. Prior: The second one is a drug to treat mild to moderate ulcerative colitis, which is another autoimmune disease that is further down the intestinal track in the colon. Surface lesions occur in the colon leading to severe cramping, pain and diarrhea. The current therapies are reformulations of an anti inflammatory drug called mesalamine. The issue with these sustained release bead reformulations is that the drug is often released before it gets to the colon and there is very inefficient delivery to the distal colon where lesions are difficult to reach. Also, the tablets are also very large, making it very difficult for children to swallow. For people that become refractory, that means they do not respond to the mesalamine, they eventually have to go on steroids, which can cause other serious complications in the body and are to be avoided if possible. Therefore, our drug is actually a prodrug. It does use mesalamine but it is chemically linked to another potent anti inflammatory drug with a different mechanism of action that is used to treat another autoimmune disease called rheumatoid arthritis. When the two drugs are connected via an azo bond both are inactive. Upon arrival in the colon there are bacteria that selectively cleave the azo bond by en enzyme called azo reductase and the activated drugs are released at the site of the lesions especially at the distal colon where current treatments fail to reach. The drug is stable in liquid formulation, so children do not have to take large pills and can take one large dose in orange juice or apple sauce for example and go off to school. We expect to boost efficacy significantly and delay or avoid steroids because of greater potency and more efficient delivery. It is very similar to the celiac product in that this drug candidate is shares very, very poor bio availability. It is very safe. There is virtually no systemic uptake. It just acts topically at the surface lesions. We confirmed in two Phase I clinical trials that the active compounds are just found in the feces; there is no prodrug found in the feces. That means we get very efficient activation and delivery throughout the entire length of the colon.

CEOCFO: ***Have the medical and investment communities paid attention? Why should they take notice?***
Dr. Prior: For the celiac product, the ability to reduce the permeability of the gut could be a new paradigm in treating a large variety of diseases mediated by bacterial toxins, viruses and not just gluten fragments (IBS-D, Crohns,etc). This is the only drug with this type of mechanism and it is the only drug that has the potential to be approved within a reasonable horizon. All other drugs in development are earlier stage. We believe our drug is de-risked because we know the dose range, we have proven its efficacy and the Phase III is highly de-risked. All the Key Opinion Leaders, in the celiac space are advisers to our company and are very excited about this program and see a really urgent need to get this to the market place. It is a very safe product that improves quality of life by reducing symptoms. For ulcerative colitis, our goal is to avoid the need to go on steroids, a more convenient oral liquid formulation, which is better for children. These products are both addressing very unmet needs, both are de-risked approaches, both offer technology platforms for other applications and this is really what motivates us.