

IBD candidate to clinic next year

Planting the stake: Landos series A hauls down \$10M for LANCL2 pathway effort

By Randy Osborne, Staff Writer

Josep Bassaganya-Riera, president and CEO of Landos Biopharma Inc., told *BioWorld* that the firm's lead compound, BT-11, in mouse models is "acting as a double-barrel shotgun" against inflammatory bowel disease (IBD), in both Crohn's disease and ulcerative colitis.

Landos, of Blacksburg, Va., raised \$10 million in a series A round from exclusive investor Perceptive Advisors LLC to pay for work focused on a pathway called lanthionine synthetase c-like 2, also known as LANCL2. Pharmacological activation of LANCL2 by BT-11 intercepts IBD by increasing anti-inflammatory markers such as interleukin-10 and FOXP3, and by decreasing pro-inflammatory markers like interferon-gamma, MCP-1 and TNF-alpha.

Operational efforts are partnered with Xontogeny LLC, of Boston, a life sciences accelerator led by industry veteran Chris Garabedian, who appreciated "not only [the CEO's] depth of understanding of this pathway but his passion behind it, and more importantly, the numerous animal models that he looked at with the lead compound. When you're dealing with early stage technology, often there's not a whole lot of information that you have to do your due diligence on. This was a scenario where not only had [Bassaganya-Riera] basically facilitated a pretty large preclinical dataset, but it was done with high quality in referenceable models that are industry standards," proving that "the performance of the compound on down-regulating these pro-inflammatory targets and increasing anti-inflammatory targets was very uniquely differentiated."

After hematology/oncology, the immune-inflammatory space is especially hot now, Garabedian added. "I was very intrigued with the quality of the work. More than a lot of scientific founders, he had a lot of business savvy. This really became almost the model of what I aspire Xontogeny to be, in terms of partnering with these top-tier scientists in important areas of research."

Landos has taken on the drug development work begun by Biotherapeutics Inc., also of Blacksburg, Va. The LANCL2 push had reached a "level of maturity" at which officials realized a separate business model was called for, Bassaganya-Riera said. "We were at the point where I think it was timely to separate the therapeutics assets and [put] them under its own company and its own brand."

Research into LANCL2 started in 2005 and 2006 when scientists were exploring glycemetic-controlling action and anti-inflammatory effects of its natural analogue, abscisic acid (ABA), a plant hormone discovered about 50 years ago. "We did not know how it worked," Bassaganya-Riera said, but conducted biochemical assays and preclinical studies in knockout mice that "provided the blueprint which was the starting point for the medicinal chemistry program."

Biotherapeutics reported the beneficial effects of ABA on glycemetic control and inflammation in a an article published earlier this year in *Frontiers in Nutrition*. Present in moderately high concentrations in fig and citrus fruits, and at lower levels in many common vegetables, ABA was found to reduce fasting blood glucose and improve the response to glucose loads at one mcg/kg oral doses in mice, rats and humans. Further research established new chemical entities, including BT-11, and the company has established a patent estate around them.

'Real growth' at the end of phase II

The orally available candidate is designed to function locally, and safely, in the gut, Bassaganya-Riera said. A professor at Virginia Tech, he is director of the Center for Modeling Immunity to Enteric Pathogens, a \$12 million center funded by the NIH and formed to investigate the immunoregulatory mechanisms underlying infections with gut pathogens by applying mathematical systems to mucosal immunology. He and Garabedian began formulating plans for Landos over breakfast in midtown Manhattan about three years ago.

Although the work is early, the CEO noted that rodent models deployed in experiments so far are the same ones that big pharma companies have used in developing its drugs. "Obviously, we still don't have an IND so we cannot test this [compound] directly," he said, but researchers have obtained blood from patients with Crohn's disease "and extracted the key immune cells that, based on the mouse models we had seen, were being modulated effectively." Scientists did cell-culture experiments, treating at "increasing concentrations in these primary human cells" and thereby proving that outcomes are "clearly translatable to humans," he said. "I have no doubt

we'll be in the clinic in the second half of 2018."

With 13 employees, Landos owns 5,000 square feet of lab space and animal facilities where the mice are created. "We are intending to continue for the time being as a very lean company," Bassaganya-Riera said. "We don't anticipate a major expansion. After we have the phase I data, we'll be raising about \$25 million in a series B [round] in order to support the phase II proof-of-concept" study, he said. "After that, we are intending to hopefully go [with an] IPO."

Although a "variety of possible exit strategies" may be available, "right now the company is an independent company and I believe we can continue to be an independent company and so the IPO route seems to be the more likely," he said. "The real growth will happen at the end of phase II, where we'll get to an inflection point in the value of the lead asset." Landos takes its name from the first three letters of the targeted pathway's name and from "dos," which means "two"

in Bassaganya-Riera's native Catalan and Spanish.

In August, the latest findings with BT-11 were published in the *Journal of Medicinal Chemistry*. Specifically on the patent front, Landos' technology includes composition-of-matter claims protecting BT-11, 48 privileged scaffolds and 3 billion compounds. Along with the intellectual property in lead indication IBD, the company owns method-of-use and composition-of-matter claims for that indication generally, as well as for diabetes (type 1 and 2) and influenza-related lung inflammation.

Xontogeny, for its part, in May closed a \$15 million tranche of a \$25 million series A financing. Chairman and CEO Garabedian founded the firm in June 2016, and his 25 years in the industry include time at the likes of Foster City, Calif.-based Gilead Sciences Inc. and Celgene Corp., of Summit, N.J. Most recently, he served as CEO of Cambridge, Mass.-based Sarepta Therapeutics Inc.