BIOCENTURY

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EMERGING COMPANY PROFILE

Interius design: Penn spinout gets specific with in vivo CAR Ts

BY JEFF CRANMER, EXECUTIVE EDITOR

Cell and gene therapy company Interius has $76 million from a series A funding led by Bihua Chen's Cormorant and Fairmount and the guidance of Executive Chairman Lonnie Moulder to develop an in vivo CAR T technology spun out of the University of Pennsylvania that the company says gives it the specificity it needs to deliver genetic payload to cells of choice.

Co-founded by Saar Gill, a physician-scientist at the University of Pennsylvania's Center for Cellular Immunotherapies, and biotech executive and VC Bruce Peacock, Philadelphia-based Interius BioTherapeutics Inc. is developing a gene delivery platform to generate chimeric antigen receptor (CAR) T cells directly in vivo with an initial focus on B cell lymphomas.

Moulder told BioCentury that the company's technology "allows for bypassing the entire cell processing paradigm that exists today for CAR Ts and the lymphodepletion through high-dose chemotherapy that's administered to patients prior to receiving their CAR Ts."

The company is one of six portfolio companies of Tellus BioVentures, the family office of Moulder, who co-founded and led Tesaro Inc. until he sold it to GlaxoSmithKline plc (LSE:GSK; NYSE:GSK) for about $5.1 billion in January 2019.

Initial funding for Interius included a $5.5 million seed round led by Tellus.

Interius' technology enables selective delivery of gene therapies encoding CARs to T cells in vivo via lentiviral vectors, turning them into CAR Ts.

CEO Phil Johnson told BioCentury the company achieves "exquisite specificity" for T cells with cell-specific binders on the viral vectors.

"We can engineer binders into the envelope, into the membrane so that it can attach to specific cells, very specific cells, say CD4 cells or CD8 cells," said Johnson, who joined the company as a consultant last summer before becoming CEO in January. "So that's the beauty of the system is that we can really direct the payload to the cell of choice."

Johnson, who was previously founding CSO and CEO of gene therapy company Limelight Bio, which also has ties to Penn, said the same strategy can be applied to target other cell types — an application the company plans to explore. "In essence, we can target any cell in the body."

"I want a toolbox, where I reach in and grab the implement that I want," Johnson said. "So, we want to fill that toolbox up with different binders for different cells, not just T cells."

COMPANY PROFILE
Interius BioTherapeutics Inc.

Philadelphia, Pa.

Technology: Gene delivery platform to generate chimeric antigen receptor (CAR) T cells directly in vivo

Origin of technology: Not disclosed

Disease focus: Cancer

Clinical status: Preclinical

Founded: 2019 by Saar Gill and Bruce Peacock

Academic collaborators: Not disclosed

Corporate partners: Not disclosed

Number of employees: Not disclosed

Funds raised: $81.5 million

Investors: Tellus BioVentures, Cormorant Asset Management, Fairmount Funds, Bain Capital Life Sciences, Pfizer Ventures, RA Capital Management, Longwood Fund, Logos Capital, Osage University Partners, Quan Capital, the University of Pennsylvania and Penn Medicine, Agent Capital, the Mark Foundation for Cancer Research, Knollwood, and American Cancer Society's BrightEdge fund

CEO: Phil Johnson

Patents: None issued

Johnson said the company's early data support T cell-specific targeting and have not raised concerns about off-target effects. He said that the data suggest, for example, that the virus does not attach to and transduce hepatocytes, neurons or other cells.

Early data haven't raised other safety concerns including cytokine release syndrome either, said Johnson.

"We might get cytokine release syndrome, but our therapy will come on more slowly. And perhaps the cytokine release syndrome will be less dramatic and less impactful," Johnson said. "We won't know that until we get into the clinic, quite frankly, but theoretically, it has potential to be less of a problem."

Most lentiviral gene therapies are ex vivo products, where insertional events can be monitored before transfusion.

A cloud was cast on integrating vectors in February when FDA placed a clinical hold on a gene therapy from bluebird bio Inc. (NASDAQ:BLUE) because of a suspected serious adverse reaction of acute myelogenous leukemia. The company has since said that it is "very unlikely" the cancer was caused by the BB305 lentiviral vector.

Johnson is confident in Interius' platform as regards the safety of integration, pointing to a long track record of lentivectors with no serious adverse events. He also noted that treatment with CAR T cell therapies has yet to lead to any instances of insertional oncogenesis or mutagenesis.

Next up, the company plans to run studies in non-human primates to gather efficacy and toxicity data before submitting an IND in 18-24 months.

The team's R&D is led by VP of Research Brian Busser, who joined Interius from Beam Therapeutics Inc. (NASDAQ:BEAM), where he led initiatives to de-risk base editing for cell and gene therapy applications, and Cellectis S.A. (Euronext:ALCLS; NASDAQ:CLLS), where he was part of an R&D team that advanced four allogeneic CAR-T therapies to the clinic.

The lack of disclosures among other in vivo CAR T companies precludes easy comparisons, but Johnson did say that he believes the company with the technology that's most similar to that of Interius is Sana Biotechnology Inc. (NASDAQ:SANA).

Sana debuted in January 2019 with a team of former Juno Therapeutics Inc. executives and a goal of aggregating R&D and manufacturing capabilities across cell and gene therapy treatment paradigms. CEO Steve Harr was CFO and head of corporate development at Juno, and Sana Chairman Hans Bishop was president and CEO. In February, Sana completed the biggest pure-play biotech IPO in NASDAQ history at $675.6 million; by the time it went public the Seattle-based company had raised more than $700 million in venture funding.

As Interius continues to build its team, its priority is hiring someone to lead BD and an HR director, as well as more lab scientists.

The BD lead, Johnson said, will help Interius manage its partnerships, which are undisclosed but focus on working with CDMOs to nail down the vector. The company is also seeking partners that can bring in different classes of binders.

Additionally, Johnson said the company is in discussions with potential partners for applications outside its initial focus in the CAR domain, and in the next few months, the company plans to begin looking at programs beyond immuno-oncology.

In addition to Cormorant Asset Management and Fairmount Funds, the round drew investment from new backers that included several other crossover investors as well as one strategic: Bain Capital Life Sciences, Pfizer Ventures, RA Capital Management, Longwood Fund, Logos Capital, Osage University Partners and Quan Capital. All existing investors participated, including lead founding investor Tellus, the University of Pennsylvania and Penn Medicine, Agent Capital, the Mark Foundation for Cancer Research, Knollwood, and the American Cancer Society's impact investment fund BrightEdge.

Johnson declined to comment on any plans for an IPO.

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EDITORIAL & RESEARCH

NEWSROOM:
news@biocentury.com

SAN CARLOS, CA:
+1 650-595-5333

CHICAGO:
+1 312-755-0798

WASHINGTON, DC:
+1 202-462-9582

UNITED KINGDOM:
+44 (0)1865-512184

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BioCentury Inc.
BioCentury International Inc.

MAIN OFFICES
1235 Radio Road, Ste. 100
Redwood City, CA 94065-1217
+1 650-595-5333; Fax: +1 650-595-5589