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# Epitopea closes $14M seed round for tumor antigen discovery

*By Cormac Sheridan, Staff Writer*

Epitopea Ltd. raised $13.6 million in seed financing to take forward a new cancer immunotherapy platform based on the identification of a new class of tumor-specific antigens encoded by non-canonical genomic sequences.

*Jon Moore, CEO, Epitopea, and operating partner, Advent Life Sciences*

The Cambridge, U.K.-based firm is building on the academic research of company co-founders Claude Perrault and Pierre Thibault, both based at the Institute for Research in Immunology and Cancer at the Université de Montréal. In a series of papers, Perrault, Thibault, and colleagues have described novel tumor antigens encoded by what were previously considered non-coding gene sequences, including long-noncoding RNAs, short open reading frames and pseudogenes.

Like classical tumor antigens, these antigens are also presented by major histocompatibility complex molecules and are recognized by CD8+ T cells. These are not included in annotated proteomics databases based on exome sequence data, however, and have been largely overlooked until now. "Their origin was not a source that had previously been examined in detail," Epitopea CEO Jon Moore told *BioWorld*.

But in one paper, published on Dec. 5, 2018 in *Science Translational Medicine*, the Montreal team reported that they identified 40 tumor-specific antigens from two murine cancer cells lines. About 90% of these were derived fro supposedly non-coding regions. The group developed a "proteogenomic" approach to antigen identification involving genomic and mass spectrometry analysis. It involves assessing both canonical cancer peptide sequences encoded by exonic DNA, as well as a "cancer-specific proteome" derived from RNA sequence data that is analyzed according to all possible reading frames.

In a subsequent paper, published on April 1, 2020 in *Cancer Immunology Research*, the group identified 103 tumor-specific antigens from 23 high grade serous ovarian cancers. Only three of these would have been uncovered by classical approaches based on analyzing mutated exonic sequences, the study authors reported. The others arose through out-of-frame translation, from non-coding sequences, or from aberrantly expressed unmutated nonexonic sequences, which were not expressed in healthy cells.

Their most recent publication on the approach, which appeared on March 18, 2021 in *Immunity*, described 58 tumor-specific antigens in 19 acute myeloid leukemia samples. A large majority – 86% – were unmutated and were derived from what were previously considered noncoding regions. Intron retention and translation was one major contributor to their occurrence; epigenetic changes constituted another.

Perrault and Thibault's approach has already received some degree of commercial validation, in the shape of a research collaboration in ovarian cancer with Martinsried, Germany-based Medigene AG, which has conducted validation work on a series of antigens. The German firm may convert these findings into T-cell-receptor-based therapies. "Epitopea has therapeutic vaccine rights for the same antigens," Moore said.

Therapeutic vaccines are the nascent firm's favored modality, Moore said, as they readily allow for the construction of multivalent vaccines that can elicit a polyvalent T-cell response. But the company is also open capturing its insights in T-cell-receptor biologics and in cell therapies. It is particularly open to partnering discussions around these two modalities.

Epitopea is a U.K.-Canadian concern, and the nascent firm has operating subsidiaries on either side of the Atlantic. Its investors also come from the U.K. and Canada and include London-based Advent Life Sciences, where Moore is an operating partner, Cambridge Innovation Capital, and two Canadian funds, CTI Life Sciences and Fonds de Solidarité FTQ. Chief business officer Steven Klein is in Canada.

The initial seed round is intended to take the company through the next two years, Moore said, during which time the company will perform additional in vitro and in vivo target validation work, additional target identification, and further build out its platform. It has not yet selected a lead indication but its focus will be on large-scale tumor indications that are currently not adequately served by existing therapies.

Opening up new target space in immuno-oncology is a key priority, given the difficulties therapeutics developers have faced in identifying clinically and immunologically relevant targets that are uniquely – and durably – expressed on cancer cells. Moore characterized Epitopea's approach as "a subtle change" rather than "a big paradigm shift," but it does suggest that oncologists need to cast the net much more widely in the hunt for new molecular handles on important cancers. Characterizing patients' neoepitope repertoire may be insufficient.

It's still an emerging concept. So far, there has been little outright opposition to the approach. "I haven't been to any conferences where there's been any arm wrestling between the different schools of thought," Moore said. A little more momentum in the next couple of years could readily change that scenario.