Melbourne researchers get backing for potential ovarian cancer treatment

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Melbourne researchers developing a potential new treatment for ovarian cancer have attracted investment that will support its progression through early testing and into clinical trials.

Researchers at the Melbourne-based Hudson Institute of Medical Research have partnered with international investor Morningside Ventures to launch a spin-off company, Epsila Bio, to develop and commercialise the treatment.

The potential treatment is based on findings led by Hudson Institute researchers that the presence of a cytokine, interferon epsilon, in the female reproductive tract activates the body's immune response to infections and has a similar immune response to cancer.

Hudson Institute chief commercialisation officer, Rob Merriel, said, "There's a huge unmet need for a breakthrough ovarian cancer treatment. This is a silent disease which is often asymptomatic, and therefore discovered too late when it has already spread extensively. Current disease management is ultimately limited by the development of chemotherapy resistance."

CEO of Epsila Bio, Dr Ronnie Farquhar, said, "Epsila Bio will leverage Morningside's expertise and financial wherewithal to translate Hudson Institute's outstanding research into a novel cancer therapeutic with meaningful patient benefit and large commercial market opportunity. The project will greatly be enabled by our strong relationships with Hudson Institute researchers."

Opportunity for improved treatment of genetic disorders of the liver

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Researchers at the Children's Medical Research Institute (CMRI) have published a new paper they say will help improve strategies for treating serious genetic disorders of the liver.

The paper titled, 'Restoring the natural tropism of AAV2 vectors for human liver', has been published in Science Translational Medicine.

Adeno-associated virus 2 (AAV2) is a viral vector that is used to deliver gene therapy to the liver. It works as a delivery vehicle to carry therapeutic DNA to the target cells in the body.

It does this is by binding a 'receptor' on the target cell, a molecule that tells the vector it is in the right place and helps to deliver its cargo into cells.

Yet clinical trials targeting diseases of the liver have had an unexpectedly low success rate using this vector. The researchers at CMRI believe they may have discovered the reason why.

According to Dr Leszek Lisowski, head of the Translational Vectorology Research Unit, and Professor Ian Alexander, head of the Gene Therapy Research Unit, the original AAV2 vector binds tightly to its attachment receptor - heparan sulfate proteoglycans (HSPGs) - too tightly.

The researchers say that in HSPGs, which are found in many places in the body and not just on liver cells, theAAV2 vector gets trapped before it reaches its intended destination. Therefore, very few vectors manage to deliver their therapeutic cargo to the liver and that greatly diminishes the therapeutic efficacy.

The CMRI researchers have studies naturally occurring adeno-associated viruses. They found they were much more successful at delivering the therapy into the liver. These viruses use another receptor that is yet to be discovered.

CMRI researchers are now able to make vectors in the lab that use this better receptor, instead of HSPGs, potentially making the next generation of gene therapy targeting the liver more successful.

"This really challenges a basic concept in our field that binding strongly to HSPG was essential for AAV's entry into human cells and suggests that vectors targeting the other receptor used by natural AAVs, of human liver origin, are likely to be more effective for clinical gene therapy applications," said Dr Lisowski.

"The prototypical AAV2, discovered over 50yrs ago, is the serotype on which the entire field of AAV vectorology and gene therapy is based. Our discovery will shake the foundations of the field of AAV-based gene therapeutics and will mark the beginning of a new era not only for biomedical research, but most importantly, for millions of patients affected by genetic disorders.

"It sheds new light and challenges our previous understanding and corrects misconceptions about how the vector binds to the cells," he added.

Lead author on the publication, Dr Marti Cabanes-Creus, said they could now move forward to improve on the use of vectors to help children with liver conditions. "It will help us understand previous clinical data and how to improve on these," he said.

"By having a better vector, we can increase the safety and improve the efficiency. Because a lower dose will be needed to achieve therapeutic efficacy, the cost of those therapies will be decreased, which is an additional benefit to the patients, their families and the healthcare system."

Dr Cabanes-Creus added. "The lessons learnt can potentially be extended to other tissues, beyond the liver, making this a very impactful study which will change the trajectory of AAV-based gene therapies."