

New strategy for treating autoimmune diseases

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Country

Italy

The checkpoint protein on immune cells may have another role to play in treating disease besides fighting cancer. This is the proposition being put forward by Altheia Science Srl, a new Italian biotech which is building a pipeline of agents to modulate programmed cell death-1 (PD-1) and its ligand (PD-L1) for the treatment of Type 1 diabetes and multiple sclerosis.

On 25 September, the company announced that it had raised \$11 million from a Series A financing round enabling it to begin operations in the US and exploit technology in-licensed from the Children's Medical Center Corp, the holding company for Boston Children's Hospital.

The concept is to modulate PD-L1 expression at a molecular and protein level as a way of treating Type 1 diabetes and multiple sclerosis. Both disorders are autoimmune diseases where the immune system attacks healthy tissue. Both are associated with a decreased expression of PD-L1. Cancer on the other hand is associated with an overexpression of PD-L1 which enables tumour cells to resist immune attack.

Altheia aspires to eventually develop therapies for both autoimmune diseases and cancer.

But the auto-immune sector will be its first port of call.

"Altheia Science's approach will transform the natural history of autoimmunity by modulating PD-L1 expression in patients' haematopoietic stem cells, achieving durable clinical benefit," the company said in a statement. This could be done with molecules that control the PD-L1 pathway and/or by lentiviral vector-based engineering of patients' haematopoietic stem cells.

Type 1 diabetes occurs when auto-reactive T cells destroy insulin-producing beta-cells in the pancreas. Altheia aims to restore a correct expression of PD-L1 on haematopoietic stem cells, enabling the eradication of these T cells. Multiple sclerosis is caused by the degeneration and disruption of the myelin sheaths around axons of the brain and spinal cord. Here, the company plans to abort the autoimmune mechanism by infusing into patients autologous haematopoietic stem cells whose PD-L1 expression has been restored.

Altheia's scientific founders are Alessandra Biffi and Paolo Fiorina. Prof Biffi is a paediatric haematologist and stem cell transplant physician with experience in gene therapy and translational medicine. She is currently a principal scientist at the Harvard Stem Cell Institute. Dr Fiorina is an immunologist, internist and associate professor of endocrinology. He is director of the Romeo ed Enrica Invernizzi International Center for Type 1 diabetes at the University of Milan.

Altheia was founded in January with the help of the technology transfer company AurorA-TT.

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