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Cartherics, Toolgen Gene-Edit Stem Cells For Cancer Immunotherapies

Melbourne's Cartherics says it will combine its immunology and stem cell science with the Seoul-based Toolgen's gene-editing technology to enhance immunotherapies for cancer.

Cartherics said that current cancer cell therapies were developed for individual patients at a high cost in time and money and were restricted to certain cancer types.

The company said the collaboration aimed "to overcome these disadvantages by accelerating Cartherics' goal of developing accessible off-the-shelf, effective, immune cell therapies for aggressive diseases such as relapsed ovarian and bowel cancers".

Cartherics chief executive officer Prof Alan Trounson said the collaboration would "enable precision gene-editing of our stem cells to increase their ability to track to and destroy targeted tumors".

"The collaboration will merge very effective gene, stem cell and [chimeric antigen receptor T] cell technologies in the two companies for advanced cancer therapies," Prof Trounson said.

Toolgen chief executive officer Prof Jongmoon Kim said the collaboration "indicates wide applicability of our gene editing technology to various cell types including immune and pluripotent stem cells".

Cartherics said that in healthy individuals, T-cell immune system cells identified and killed infected or abnormal cells, including cancer cells and immunotherapy harnessed the immune system to target and kill the invader cells.

The company said the collaboration would focus on enhancing the cancer-killing ability of chimeric antigen receptor T-Cells (CAR-T cells), which were engineered molecules that recognized cancer cells and activated killer T-cells.

Cartherics said its CAR-T cells would targeting one or more tumor targets, derived from either patient T-cells or from induced pluripotent stem cells, while Toolgen's technology would edit the genetic material in the CAR-T cells, based on clustered regularly interspaced short palindromic repeats-associated protein 9 (CRISPR/Cas9).

The company said that Toolgen had intellectual property on the inhibitory effect of the molecule diacylglycerol kinase (DKG) on T-cell function as well as CRISPR/Cas9.

Cartherics chief scientific officer Prof Richard Boyd told Biotech Daily the project would apply the gene editing of T-cells and induced pluripotent stem cells to optimize the function of CAR-T cells for use in cancer trials.

Prof Boyd said that in-vitro and in-vivo research would investigate whether CAR-T cells engineered to be DKG deficient triggered a stronger immune response than CAR-T cells containing the gene, with the aim of the first human clinical trial in 2021.

Cartherics is a private company.