Can Cellular Therapy Treat Diabetes?

Diabetes is a condition afflicting some 537 million people worldwide, and according to the World Health Organisation (WHO), claimed the lives of between 1.5 million and 2 million people in 2019. Even those who do not suffer such extreme outcomes still have to use monitoring equipment and insulin injections to manage the condition.

Now, however, there may be a new solution on the horizon. A collaboration between the Abu Dhabi Stem Cells Centre (ADSCC) and two Japanese institutions is looking to cellular therapy to treat the disease. If successful, the venture could mean that sufferers of diabetes can mitigate the difficulties of living with their condition through an innovative new form of therapy which relies on genetically modified cells rather than insulin infusions.

Cross-continental collaboration

The ADSCC announced its new joint venture in January of this year. According to the terms of the arrangement, the Emirati institute will work alongside the Centre for iPS Cell Research and Application (CiRA) at Kyoto University in Japan, which is widely recognised as one of the leading lights in the field. In order to make the collaboration go smoother, the ADSCC have already launched a laboratory on the Kyoto University campus.

Meanwhile, additional support and expertise is being provided by the Japan-based biotech company Rege Nephro, which specialises in renal disease therapeutics. The combination of different knowledge sets and acquired experience will hopefully lead to landmark breakthroughs in the treatment of diabetics in the UAE, Japan and further afield.

A revolutionary treatment

If all goes to plan, the way in which diabetes sufferers manage their condition will change forever. The new treatment relies on the development of pancreatic beta cells from human-induced pluripotent stem cells (iPS cells). After being extracted from blood or skin tissue, the cells are genetically modified to replicate the intended functions of the malfunctioning tissue present in diabetics.

The idea here is that by introducing these reprogrammed iPS cells into the immune systems of the sufferers, they can produce sufficient amounts of glycated haemoglobin (and therefore achieve healthy blood glucose levels) which the affected cells cannot. As such, this could theoretically dispense with the need for injecting insulin to maintain blood sugar levels, or even the constant monitoring of said levels, thus making the disease much easier to live with.

Paving the way

The collaboration comes hot on the heels of the Food and Drug Administration's (FDA) approval of the first allogenic pancreatic islet cell therapy for the treatment of type 1 diabetes in the USA. Landitra was given the green light by America's regulatory body after over two-thirds of subjects in clinical trials reported insulin independence for at least a year – and one third did not need to inject themselves for over five years.

"At ADSCC, we are on a mission to make a profound impact in the field of diabetes care and cellular therapy globally, and in pursuit of this ambitious journey, we have consciously embarked on this strategic partnership with CiRA and Rege Nephro," explained Professor Yendry Ventura, CEO of ADSCC. "With the Department of Health - Abu Dhabi's support in innovation and research, we believe this partnership will pave the way for transformative healthcare solutions in our region and beyond."