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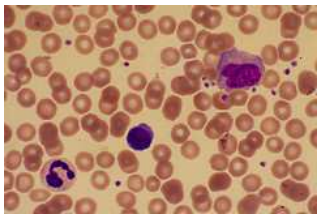
Stem cells with human heart tissue ‘reprogrammed’ to improve treatments



Washington, May 20 : For the first time, Spanish researchers have used adult cells extracted from human heart tissue to turn stem cells from adipose tissue into cardiac myocytes.

In other words, they achieved to “reprogram” adult stem cells, which might improve treatments for heart disease therapeutical.

Currently, the use of stem cells in heart disease treatments is one of the most common practices. However, working with stem cells involves many difficulties.

Thus, inducing cell differentiation into cardiac muscle (cardiomyocytes) may be one of the best options in the treatment of these pathologies.

For the study, researchers isolated adult human stem cells from lipoaspiration. Subsequently, these cells were temporarily permeabilized and exposed to a human-auricle cell extract. Then, these cells were recovered in culture.

After 21 days in culture, the cells differentiated towards a cardiac myocyte phenotype, which was demonstrated by expression of morphological changes (appearance of binuclear cells with striated fibers and ramifications), detection of cardiospecific markers through inmunofluorescence, and the presence of cardiac muscle-related genes that were analysed through RT-PCR; and finally, by expression of reverse transcription.

Thus, mesenchimal stem cells acquired a cardiac phenotype.

The technique, developed by researchers from the University of Jaen (Spain), the University of Granada, the Hospital Clínico Universitario of Malaga and the University of Bath (United Kingdom), could be used in the future for regeneration of cardiac muscles through the use of cells directly extracted from the patient.

However, physicians have remarked that, at present, this research is in its earlier stages, and it will be a long time until it has any therapeutical use.

Currently, researchers are preparing a new approach for introducing the cell extract into the target cell (by using a cell microinjector) that will allow them to obtain a larger number of viable differentiated cells, which is essential for their having any therapeutical use.

The following step is to use animal models to validate differentiated cells' functionality.

Finally, a number of clinical trials should be conducted to assess the viability of this technique in human patients.

It is going to be published on the Journal Cytotherapy, the official reporting organ of the International Society for Cellular Therapy (ISCT). (ANI)

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