NOVEL SET OF MARKERS TO SELECT ACTIVE ADIPOSE STEM CELLS (ASC) FOR IMPROVING EFFICACY OF CELL THERAPY

INNOVATION AND DESCRIPTION OF THE TECHNOLOGY

Cell therapy with mesenchymal stem cells (MSCs) has been described as a promising clinical strategy for regenerative medicine due to their immunosuppressive and tissue repair properties. Adipose tissue is an important source of this cell type (named ASCs) since they are more potent in terms of immunomodulation than their bone marrow counterparts. However, it must be stated that although they are proven to be effective, cell therapy in clinical trials is not as effective as it would be expected. These discrepancies may be due to differences in the donor's innate immune properties of ASCs as a result of the donor's metabolic phenotype, a point rarely considered.

This invention consists of a specific panel of markers that allow clinicians select those ASCs samples with the best immunomodulatory characteristics while avoiding those less active or even with pro-inflammatory features. This pre-selection of the stem cells samples with the highest immunomodulatory properties is therefore essential in order to improve the efficiency of cell therapy.

Furthermore, this invention establishes a specific method that consists of the *ex vivo* treatment of ASCs to improve their immunomodulatory properties, rendering them good candidates for therapy. This method may be especially useful for autologous therapy in patients with poor ASCs quality (ie. inflammatory diseases such as Crohn's disease).

In summary, the characterization of mesenchymal stem cell subpopulations is crucial to improve cell therapy efficacy with a pre-implant selection of those stem cells samples with the best properties for carrying out the cell therapy of interest.

MARKET AND ADVANTAGES OF THE TECHNOLOGY

The goal of this technology is to increase the efficacy of ASC therapy by selecting high quality samples before their use in cell therapy. To take a concrete example, these procedures may prove useful to improve Crohn's disease and some related complications such as perianal fistulas.

The adequate selection and characterization of these subpopulations is crucial not only to elucidate their true physiological nature but also invaluable for the development of new successful cell therapies.

The selection of the ASCs with the best immunomodulatory properties is a novel aspect, not raised to date for Crohn's disease or any other kind of disease susceptible to stem cell therapy.

IPRS AND CONTACT

This technology was developed by CIBERDEM research groups : http://www.ciberdem.es/

Patent application filed on 18 September 2017. Further information is available by contacting:

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