ADIPOSE-DERIVED STEM CELLS FOR REGENERATIVE MEDICINE

BY

DR. HO CHOON MOY
ID- 1001128037
(JAN 2011 BATCH)

THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE (ANTI-AGING, AESTHETIC AND REGENERATIVE MEDICINE)

In the Faculty of Medicine and Health Sciences, UCSI

AUGUST 2013

ABSTRACT

Regenerative medicine which promises a paradigm shift in the treatment of many diseases is a combination of various disciplines which include medicine, biology and engineering. Stem cell is the keystone of regenerative medicine and tissue engineering. Research efforts involving isolation of multi-potent cells from adult tissue is playing an increasingly important role because the use of embryonic stem cells remains controversial. A reliable source of stem cells, biomaterial scaffolds and cytokine growth factors are required for this emerging field of regenerative medicine. Adipose tissue has the ability to differentiate along multiple lineage pathways and therefore it is an abundant and accessible source of adult stem cells.

Adult stem cells have been identified in several different types of tissue, including bone marrow, blood, nervous tissue, skeletal muscle, gut, and adipose. The literature is now replete with evidence that adipose tissue contains a readily available, abundant, and expandable source of adult stem cells that can be directed towards several different lineages. This review focuses on human subcutaneous adipose tissue depots as a potential source of adult or somatic stem cells. With the increased incidence of obesity, subcutaneous adipose tissue is abundant and readily accessible As such, adipose tissue is a promising, readily available, and rich source of adult stem cells. This material is routinely discarded. Adipose-derived stem cells are multi-potent and hold promise for a range of therapeutic applications.

This research paper is to find out whether adipose tissues have stem cells; to identify the optimal harvest sites for adipose-derived stem cells; to find out how adipose-derived stem cells work; the routes of administration of adipose-derived stem cells; what are the therapeutic indications; risk of carcinogenesis and long term safety.

This research focused on human subcutaneous adipose tissue depots as a potential source of adult or somatic stem cells. Adipose tissue is an abundant source of mesenchymal stem cells, which have shown promise in the field of regenerative medicine. Mesenchymal stem cells are present in adult tissue, including bone marrow and adipose tissue. This research focused on any types of adipose-derived stem cells.