Sharmila Fagoonee, J Stem Cell Res Ther 2017, 7:8(Suppl)
DOI: 10.4172/2157-7633-C1-026

Potentiality of spermatogonial stem cells in regenerative medicine

Sharmila Fagoonee
University of Turin, Italy

Adult stem cells have gained in attractiveness over embryonic stem cells for liver cell therapy due to their origin, multipotentiality, and the possibility of autologous transplantation. In the last two decades, great strides have been made in spermatogonial stem cell research showing the potentiality of these stem cells in organ regeneration and in the field of regenerative medicine. Spermatogonial stem cells derived from post-natal or adult mice are capable of differentiating into spermatozoa *in vivo*. A spontaneous embryonic stem cell-like conversion is also observed *in vitro* in long-term cultures. These pluripotent spermatogonial stem cells can be induced to differentiate into cells of the three germ layers without ethical constraints. We have recently shown that functional hepatocytes can be derived from mouse pluripotent spermatogonial stem cells for *in vitro* and *in vivo* use. These cells can thus provide a very promising source of hepatocyte-like cells for the regeneration of damaged tissue and for restoring liver functionality.

Biography

Sharmila Fagoonee is a Researcher at the Institute of Biostructure and Bioimaging of the Italian National Research Council at Molecular Biotechnology Center in Turin, Italy. After her BSc (hons) in Biology at Mauritius and MSc in Cellular Biology at Bordeaux, France, she got her PhD in Cell and Molecular Biology at the University of Turin. She also holds a MSc in Molecular Biotechnology. During her PhD, she worked on heme and iron metabolism in mouse models of liver diseases. After a period at BIDMC, Harvard, Boston, she shifted to study the differentiative capacity of mouse pluripotent spermatogonial stem cells *in vitro* and *in vivo*. Using bioinformatics analysis, she identified new pluripotency- and stemness-related genes in pluripotent stem cells. She is currently interested in human stem cells based therapy for liver diseases and in studying the mechanisms leading to and in developing new biomarkers for liver fibrosis.

sharmila.fagoonee@unito.it

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