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Isolation of mesenchymal stem cells for the treatment of lung fibrosis in an animal model

Background: Recent reports have shown that mesenchymal stem cells (MSC's) could be used for transplantation in various animal models. Mesenchymal stem cells exhibit remarkable plasticity and harbor potential for use in therapeutic applications, such as lung fibrosis.

Aim & Method: The aim of this study was to isolate mesenchymal stem cells from rat bone marrow, count the actual MSC's numbers and their viability using flow cytometry and infuse them on an experimental injured animal model. We used magnetic beads (MACS) as a delivery system for novel mesenchymal stem cells (MSC's) isolated from rat bone marrow and the total number was counted using a Beckman Coulter FC 500 flow cytometer.

Results: Bone marrow samples from 60 Wistar rats, >250 g and six weeks old, were used for the isolation of MSC's. All samples were stored at room temperature and processed immediately. The MSC's were isolated and the absolute numbers of MSC's as well as the viability of each sample was determined using flow cytometry. We used trypan blue to distinguish the viable cells and the mesenchymal cells for microscopic analysis as well.

Conclusion: We succeeded to isolate MSC's from all 60 samples with a mean value of 1.14×10^6 , while the number of unsorted bone marrow cells required for a transplant is 1.05×10^6 by bibliography. We found that the mean viability value of the samples was 77.6% suggesting good sample collection and processing conditions.

Biography

Vasiliki E Kalodimou is the Director of the Flow Cytometry-Research and Regenerative Medicine Department at IASO Hospital in Athens, Greece. She has studied and worked with progenitor cells from placenta, umbilical cord and adipose tissue along with their applications in regenerative medicine and flow cytometry. She has publications in these fields, including Research Fellowships. She has published 2 books about flow cytometry, the Greek edition was published in 2010 and in 2013 the book was published from AABB Press USA. In 2015 she published her 3rd book, "A Handbook to Mesenchymal Stem Cells in Regenerative Medicine". She is a Flow Cytometry/Stem Cell Specialist, Leader at AABB CT Subsection: CT Product Manufacturing and Testing-USA, Scientific Consultant in Regenerative Plastic Surgery Institute/Pure Aesthetics, Brazil, AABB Assessor-USA and Editor in 12 scientific journals, Editor-in-Chief in 4 scientific journals and her biography was included in *Who's Who in The World* 2014, 2015 & 2016 edition.

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