

2nd Annual Conference and Expo on

BIOMATERIALS

March 27-28, 2017 Madrid, Spain



Raphael Gorodetsky

Hadassah Medical Center, Israel

Fibrin interactions with matrix dependent cells: Applications and mechanism

Based on the haptotactic (cell binding) properties of fibrin, we have conducted extensive studies on the cell binding properties of fibrinogen and developed new Fibrin-based dense dehydrothermally crosslinked biodegradable Microbeads (FMB) for culturing high density of cells in suspension for their implantation. The FMB can attract and carry high number of matrix dependent cells of different types and can be used to culture stromal cells of different origin including fibroblasts, placental cells, endothelial cells, smooth muscle cells, chondrocytes and osteoblasts as well as endothelial cells. We employed FMB to isolate mesenchymal pluripotent stem cells from bone marrow and cord blood to expand them *in vitro*, and to induce differentiation *in vitro* or to implant as progenitors cells to produce cartilage and bone tissues. In parallel studies on the mechanism of cell binding to fibrin we identified new family of ~20mer epitopes on fibrinogen that seem to be responsible for the selective haptotactic activity of fibrin based matrices. Synthetic peptides of these sequences on a matrix could be used to augment cell binding to matrices in tissue engineering. The family of the short haptotactic peptidic sequences, which were termed haptides were also investigated as potent cell penetrating agents following fibrinolysis, as well as non-immunogenic synthetic cell penetrating sequences. The possible systemic adverse effects of penetrating peptides as well as fibrin derived haptides were also investigated in parallel.

Biography

Raphael Gorodetsky is the Head of Laboratory of Biotechnology and Radiobiology at the Sharett Institute of Oncology, Hadassah Medical Center, affiliated to the Hebrew University in Jerusalem. He did his PhD at the Hebrew University in 1985 and Post-Doc at UCLA Medical Center. His earlier research interests were in developing new technologies for *in-vivo* analyses of trace elements. His interests include regenerative radiobiology and biomaterials for regenerative medicine with fibrin based biomaterials and interactions with different cell types. In applied research, he was the Founder and the Chief Scientist of Hapto Biotech, later merged to form Forticel International SA and was involved in numerous other ventures. Recently, he developed placental stromal cells based therapy for modulating regenerative processes and mitigation of radiation effects. Besides his numerous publications, he co-edited the book "Stem Cells Tissue Repair" (RSC publishers, Cambridge, UK). He is the Secretary of Israel Stem Cells Society (2014-2017) and is Member in different international societies.

rafi@hadassah.org.il