

# ANNUAL BIOTECHNOLOGY CONGRESS

August 17-18, 2017 | Toronto, Canada

## Adipose-derived cells for clinical bone regeneration: a concept in motion

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This lecture will review how biomaterials and components of the extracellular matrix, i.e. structural proteins and growth factors, affect the osteogenic potential of human adipose-derived mesenchymal stromal cells (ASC). Examples of bone formation by various human adipose derived cells-based engineered matrix/tissue, via either intramembranous or endochondral ossification will be presented. The lecture will then present the development of an advanced therapy medicinal product (ATMP) based on an intraoperative use of the stromal vascular fraction (SVF) of human adipose,

containing mesenchymal and endothelial cells, to support bone repair with tissue harvest, cell isolation, seeding onto scaffolding material and implantation within 3-4 hours. A translation of this concept into a first-in-man clinical trial, demonstrating safety, feasibility and providing proof-of-principle of the biological functionality (i.e., bone formation) of the implanted graft will be presented. Another clinical case based on the use of such ATMP for mandibular bone regeneration will be shown.

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