

# Advanced Stem Cell & Regenerative Medicine

December 03-04, 2018  
Valencia, Spain

J Stem Cell Biol Transplant 2018, Volume 2  
DOI: 10.21767/2575-7725-C1-003

## Peptide-polymer based system for targeting human stem cells to bone marrow

Swati Gupta and Gurudutta Gangenahalli  
INMAS-DRDO, India

**B**one marrow transplantation (BMT) required for the treatment of hematopoietic diseases encounters challenges like limited availability of healthy cells, suboptimal homing, graft rejection etc. and therefore requires atleast 1-10x10<sup>6</sup> CD34<sup>+</sup> stem cells/kg body weight for higher chances of successful BMT. Dynamic nature of endothelial cells (ECs) not only allows it to control the traffic across the organ but also to regulate coagulation, angiogenesis, blood fluidity etc. which makes them potential target for therapeutics. As functional regulator EC express selective molecules to aid in functioning of the underlying tissue. For instance, vascular cell adhesion molecule-1 (VCAM1) which has been shown to control homing of infused stem cells and subsequent engraftment is constitutively expressed on BMECs only. In an attempt to exploit it as capturing ligand, we have

designed a peptide-polymer based system that can target infused cells to BM thus enhancing targeted delivery and reducing the number of stem cells required for successful BMT. The system constitutes a peptide specific for VCAM1 conjugated to polymers (like chitosan, PAH, PSS, liposomes etc.) that can encapsulate cells shielding them from host immune system. To assess the potential of this system we conjugated it to dextran coated iron oxide nanoparticles (Dex-IOP) and observed an increase of nanoparticle delivery to BM by 22%, 46%, 51.5% and 43% for Dex-IOP and the peptide conjugated to liposome, chitosan and PSS and PAH respectively. Evaluation of this system to target cells to BM and its regeneration is being explored and will be discussed in detail during the conference.

itsraining.swati@gmail.com