

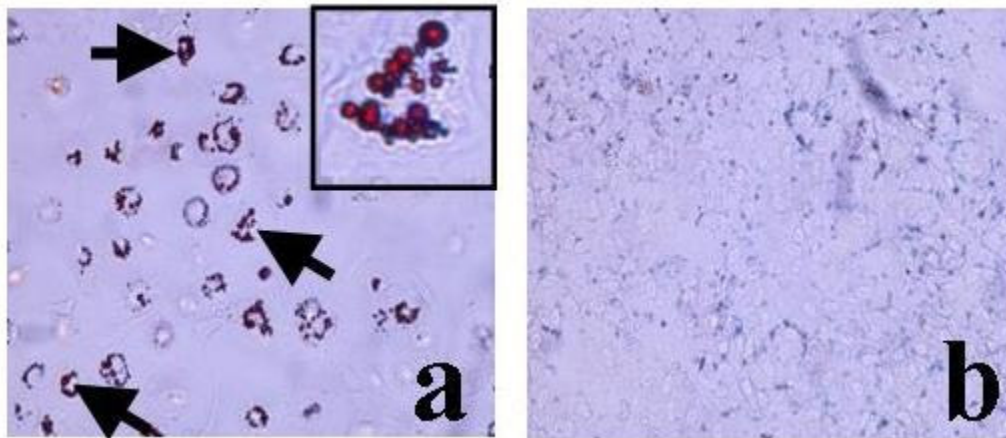
Foreign body-induced granulation tissue is a source of adult stem cells.

Patel J, Gudehithlu KP, Arruda JAL, Dunea G, Singh AK

Translational Research 2009 (in print).

ABSTRACT

In the present study we have cultured and propagated the cells obtained from the granulation tissue that forms around perforated polyvinyl tubes placed in the subcutaneous space of normal rats. We found that these cells (called granulation tissue derived stem cells, GTSC) expressed markers of embryonic pluripotent cells (Oct-4, Nanog), of adult stem cells (CXCR4, Thy1.1), and also produced high levels of vascular endothelial growth factor (VEGF) for up to ten passages. By fluorescence activated cell-sorting analysis (FACS), GTSC were positive for stem cell surface markers CD90, CD59, CD44 and negative for CD45, suggesting they were of mesenchymal origin and not of hematopoietic lineage. When incubated in specific differentiation media, these cells transformed into adipogenic, osteogenic and chondrogenic lineages, showing that they were multipotent. Further, upon systemic injection these cells were found in the vicinity of an injured site created in the liver but not in normal areas of the liver, showing their propensity to seek and engraft to an injured area in the body. We conclude that granulation tissue induced by a large foreign body is a convenient source of adult stem cells that can be maintained in culture and could be used to repair and regenerate injured tissue.



Adipogenic differentiation of GTSC cultures by incubation of cells in adipogenic medium. Staining: Oil Red O. a. Arrows show differentiated adipocytes containing lipid droplets stained red. Inset shows adipocytes containing lipid droplets stained red at higher magnification (Magnification 850-1000X). b. Control GTSC cultures grown with normal growth medium stained negative for adipocytes. Magnification of a and b: 150-250X.