STEM CELL BIOLOGY RESEARCH GROUP

Objectives

- Putting stem cells to work in the service of medicine.
- Repairing and/or regenerating tissues damaged by genetic, developmental, or acquired disease processes, cancer or aging.
- Training of medical, allied health, graduate, undergraduate, high school and M.D./Ph.D. students in the health sciences.

Current Projects and Collaborations

- Biology of breast cancer stem cells, microenvironmental effects and metastasis.
  - Investigators: JG Sharp, Ph.D., B O’Kane, Ph.D., A Kessinger, M.D., E Reed, M.D., P Mukhopadhyay, Ph.D., and T Farrell, B.S.

Breast cancer cells in bone marrow grow as epithelial “domes” in vitro


- Lymphoma stem cells and their survival in stem cell niches.
  - Investigators: JG Sharp, Ph.D., and SS Joshi, Ph.D. Former student (now postdoc at Hopkin’s) Abby Hielscher, Ph.D.

Cobblestone areas formed by lymphoma cells growing on stroma resemble hematopoietic stem cell cobblestone areas.

For translational studies that are leading to a new clinical trial, see: Hegde GV, et al. Novel therapy for therapy-resistant mantle cell lymphoma: Multipronged approach with targeting of hedgehog signaling. Int J Cancer. 2012 Apr 17.
Physical activity/exercise as a counter to inflammation, obesity and cardiovascular disease as well as promoting vascular health and immunity in cancer survivors.


- Reprogramming of bone marrow cells for tissue repair or regeneration in the elderly.
- Investigators: JG Sharp, Ph.D., P Mukhopadhyay, Ph.D., I Ahmad, Ph.D., T Farrell, B.S.

Stromal cells, stem cells, proteins and nanoscale metal/oxide substrates for prosthesis integration.

Lead Investigator: F Namavar, Ph.D., with JG Sharp, Ph.D., and G Thiele, Ph.D., R Miralami, B.S.

Is emphysema an autoimmune process?

Investigators: S Rennard, M.D., M Liu, M.D., S Kawasaki, M.D. (fellow, now faculty, U. Tokyo, Japan), JG Sharp, Ph.D., T Farrell, B.S., A Nelson, B.S., J Michalski, Ph.D., X Wang, M.D.

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In an analysis of lung repair employing a GFP parabiotic donor as the source of cells, elastase administered to the cell recipient induced emphysema (Fig 1) in the recipient, but also the cell donor, i.e. “action at a distance” by producing apoptosis [Fig 3 (no fig 2)]. The mediator of this effect appears to be T cells (Fig 4).