



Aidan Gilchrist

Capturing dynamic remodeling for stem cell culture platforms

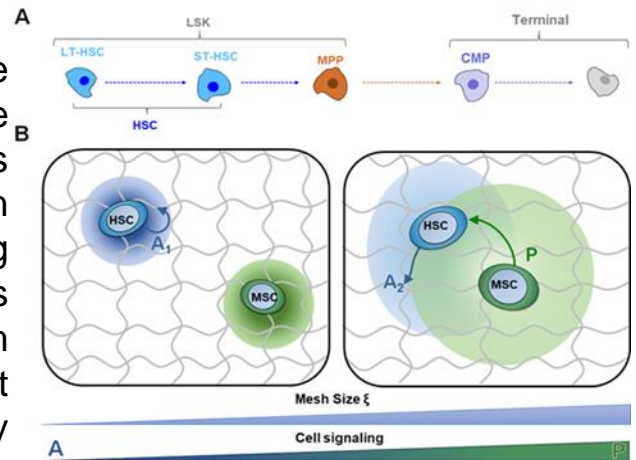
Ph.D. candidate, Material Science & Engineering
B.S. Chemical Engineering, UMass Amherst

Hometown: Dartmouth, MA

ABSTRACT:

Hematopoietic stem cells (HSCs) produce half a trillion cells daily, despite being one of the rarest cells in the body. This is accomplished by a complex interaction between the HSCs and their surrounding environment. The challenge within this project is to develop a biomaterial platform that can direct stem cell fate, without having to directly mimic the prohibitively complex nature of the human body.

We use a gelatin-based system to culture HSCs and mesenchymal stem cells (MSCs) and examine their communication through soluble factors. By tuning material properties we can control these cell-cell interactions. However material properties are not static, and change as a result of cell's interacting with the material. The project goal is to harness these dynamic properties to control stem cell fate *ex vivo*.



AWARDS/PUBLICATIONS:

- NIH T32 Fellow, Tissue Microenvironment (2018-2020)
- Outstanding Poster Award, Gordon conference (2018)
- Mavis Future Faculty Fellowship (2018)
- Racheff Teaching Fellowship (2017)
- Gilchrist, A.E., Lee, S. Hu, Y., Harley, B.A., *Coupling initial hydrogel microenvironments with mesenchymal stem cell remodeling to define a dynamic hematopoietic stem cell niche*. BioRxiv 289553 [Preprint] DOI: 10.1101/289553



HARLEY LAB

engineering cellular microenvironments and microstructures

www.harleylab.org