



Ellerby Lab

The potential project will involve modeling disease and aging in human induced pluripotent stem models or mouse models of aging and Alzheimer's disease. The Ellerby laboratory has established models of Alzheimer's disease and aging using genome engineering to create numerous isogenic patient human induced pluripotent stem models. We have omics approaches and bioinformatic analysis methods to identify novel therapeutic targets for neurological diseases and aging. The trainee will generate models of disease, study critical mechanisms in disease/aging, and evaluate therapeutic targets to validate these for the treatment of the disease.

Possible research project options include:

1. Model brain development/Alzheimer's disease using human induced pluripotent stem cells (hiPSCs) by generating brain organoids.
2. Model blood brain barrier (BBB) using human induced pluripotent stem cells (hiPSCs) and determine how APOE genotypes impact the BBB.
3. Use bioinformatics to identify molecules that prevent aging and Alzheimer's disease.
4. Use mass spectrometry to characterize aging and Alzheimer's disease phenotypes.
5. Develop technologies that allow molecules and proteins to cross the BBB.
6. Examine signaling pathways that drive aging and Alzheimer's disease.
7. Examining electrical signals of iPSC-derived neurons in different mechanistic interventions and Alzheimer's disease.