



Zuben Scott

EXPAND Mentor

Pattern analysis of exit sites in the endoplasmic reticulum

Elena F. Koslover/ Koslover Group (Winter 2023)

What you will do

Work on coding and data analysis to solve a fundamental question in biophysics with implications for Alzheimers and other neurodegenerative diseases. In the cell, there exist small structures called exit sites that package up important resources for delivery. In diseases like Alzheimers, this packaging and delivery can be interrupted, so we need to understand how exit sites efficiently perform their jobs. We will investigate this by looking at images from live cells, and seeing how the exit sites are distributed in space, something that remains poorly understood. Using simple tools from math and physics, we will determine if these exit sites are randomly scattered through the cell or if there is some underlying pattern. This project should be perfect for students motivated to learn about a cool system in biology with day-to-day work that will involve some basic coding and a bit of math.

Skills you will acquire

- Proficiency coding in either Mathematica, Matlab or Python.
- Proficiency in image analysis using one or more of the following: Fiji, ilastik (machine learning toolkit) and Matlab
- Working understanding of an important biological system
- Practice using tools in statistical analysis

Lab

[Koslover Group, UCSD](#)