THE CITY UNIVERSITY OF NEW YORK
College of Staten Island

CUNY THE CITY UNIVERSITY OF NEW YORK

# BIOLOGY DEPARTMENT SEMINAR SERIES

## DYNAMIC CELL ADHESION MEDIATED BY PROTOCADHERINS IN NEURAL DEVELOPMENT

**Greg Phillips, Ph.D**

Date: **Tuesday, April 9th, 2024**
Time: **2:30 PM**
Location: **Room 6S-138**

During embryonic development, cells recognize each other and form tissues via the action of cell adhesion molecules. The first cell adhesion molecules to be discovered, the cadherins, mediate calcium dependent homophilic adhesion in many cell types including the brain. These proteins are found most prominently in cells that exhibit ordered cell-cell junctions such as epithelial cells.

The excitatory chemical synapse in the central nervous system is also a cell-cell junction that resembles epithelial junctions. Up until the early 2000's little was known about cell adhesion processes at the synapse. It was then found that the cadherins are enriched at the synapse and play a role in synaptogenesis. The homophilic specificity of the cadherins was postulated to be a basis for the specificity of synaptogenesis and overall wiring of the brain.

However, the small number of classical cadherins limited this hypothesis. The discovery of the protocadherin gene cluster, comprising ~60 different cadherin-like proteins, makes this hypothesis more attractive given the fact that these proteins are expressed in stochastic combinations in each neuron by epigenetic regulation, generating what has been termed a "neural barcode".

Furthermore, the protocadherin gene cluster is a susceptibility locus for autism and schizophrenia. Studies in my laboratory have shown that the clustered protocadherins behave much differently than classical cadherins, exhibiting dynamic trafficking between the cell surface and intracellular pools. This regulation may account for the diverse actions of these proteins in early and late neural development.

**~ Clue Event**