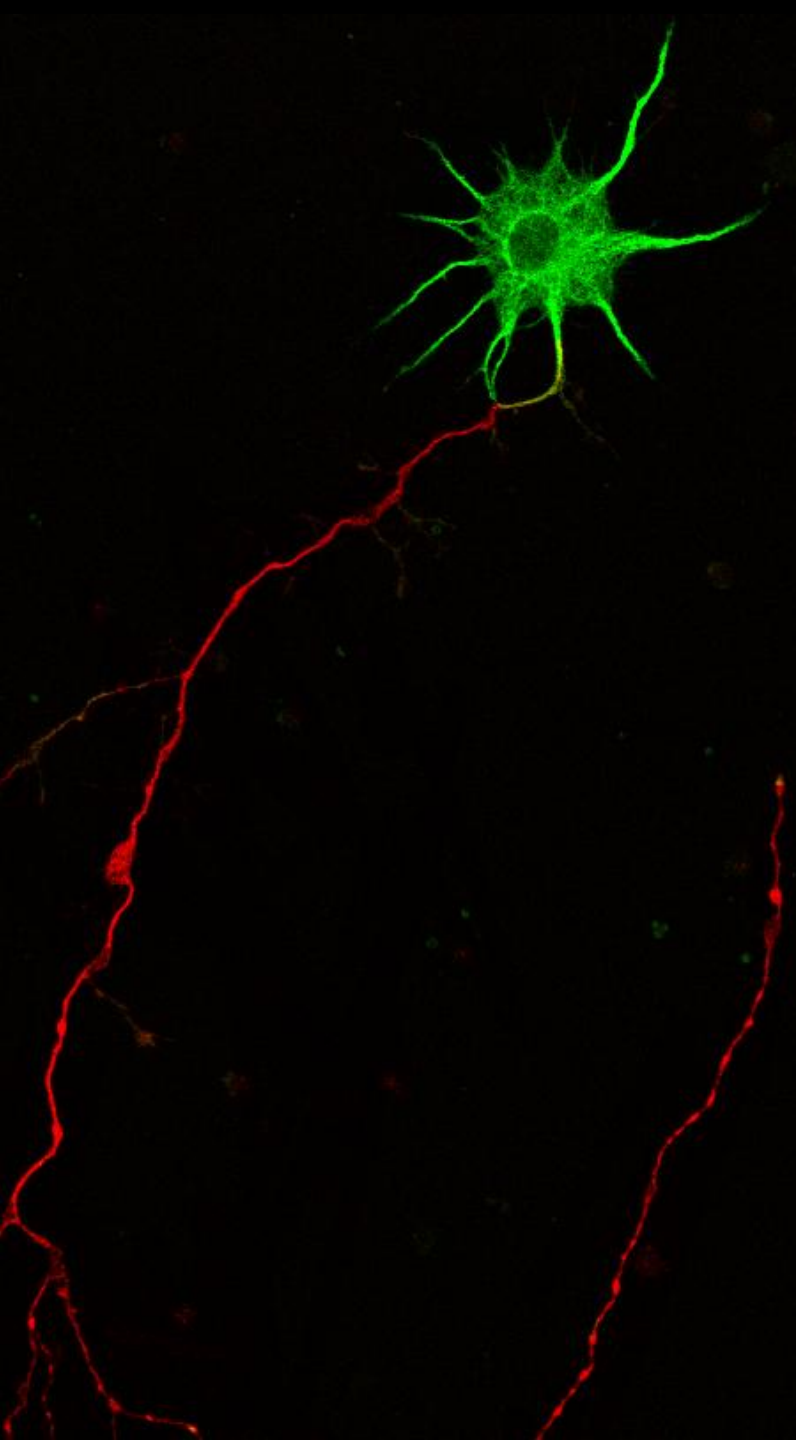
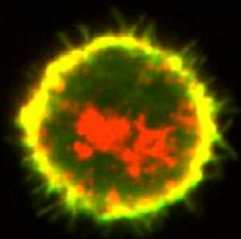
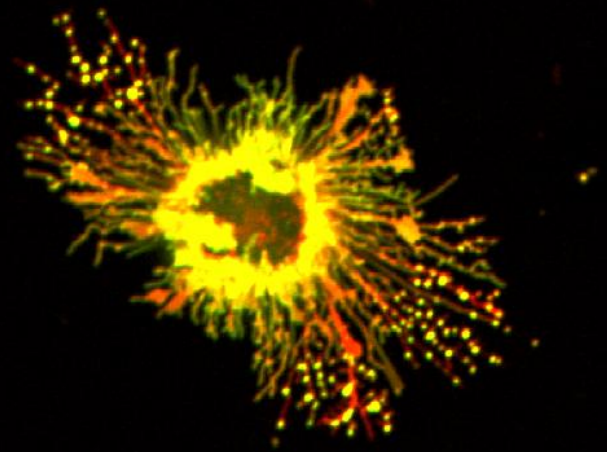


Tennessee TECH
Department of Chemistry



Laboratory of Brain Biochemistry and Molecular Engineering



Anthony Paul Barnes
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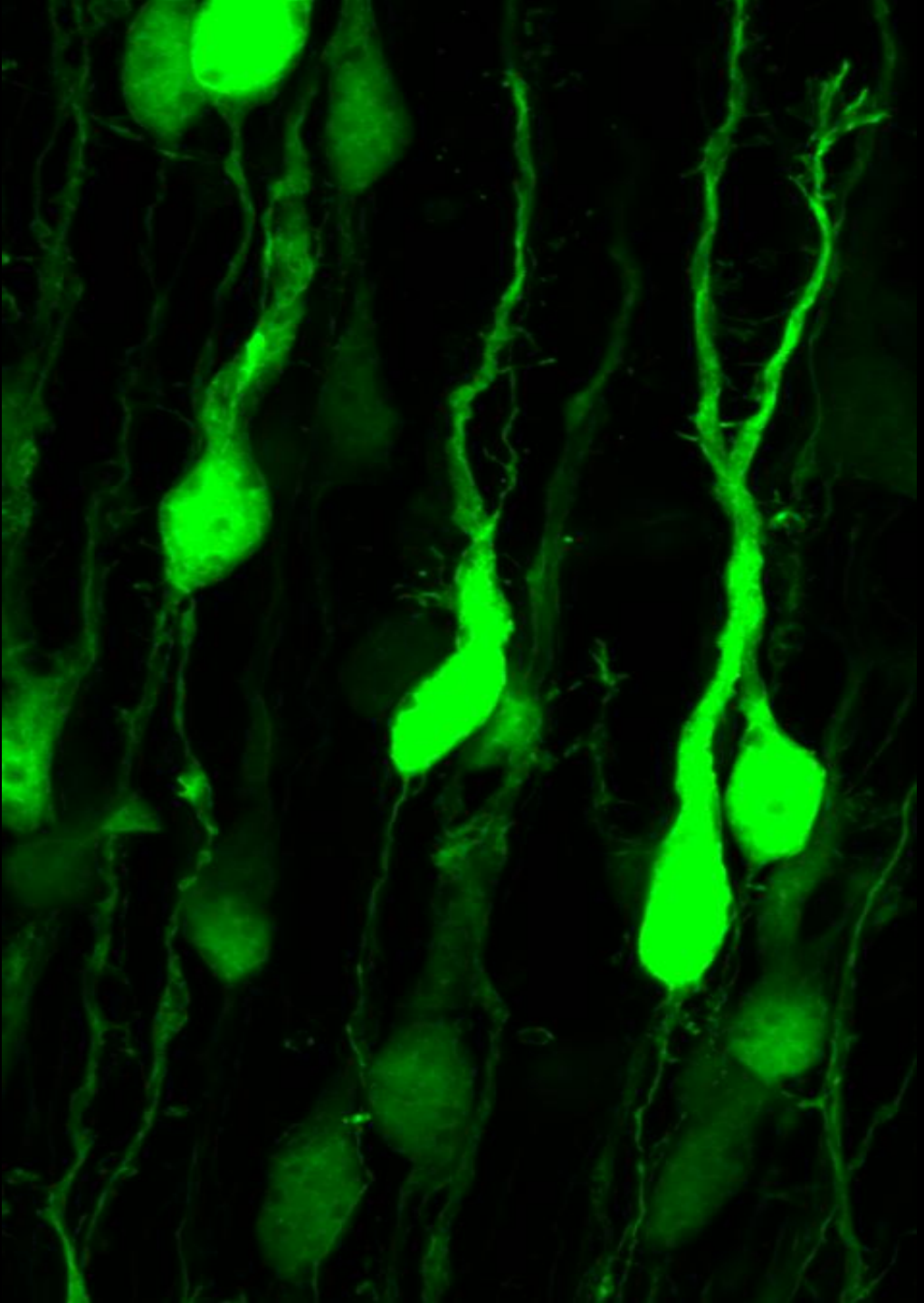
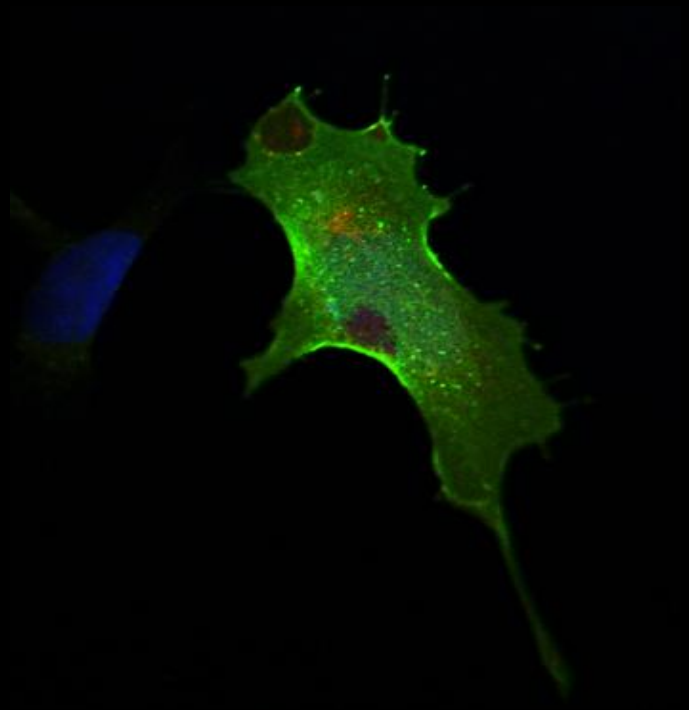


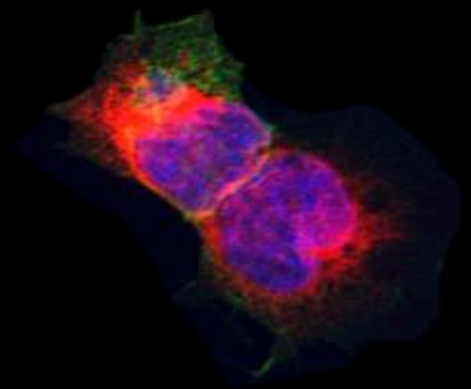
Project 1

Neuronal Signal Transduction

This project is focused on understanding how signaling molecules regulate the development of individual nerve cells and their connections as well as overall brain development.

These studies require a combination of approaches including: molecular cloning, protein expression, purification of protein complexes, mass spectrometry, cell culture, transcriptomics (bulk and single cell/nucleus) and imaging.





Project 2

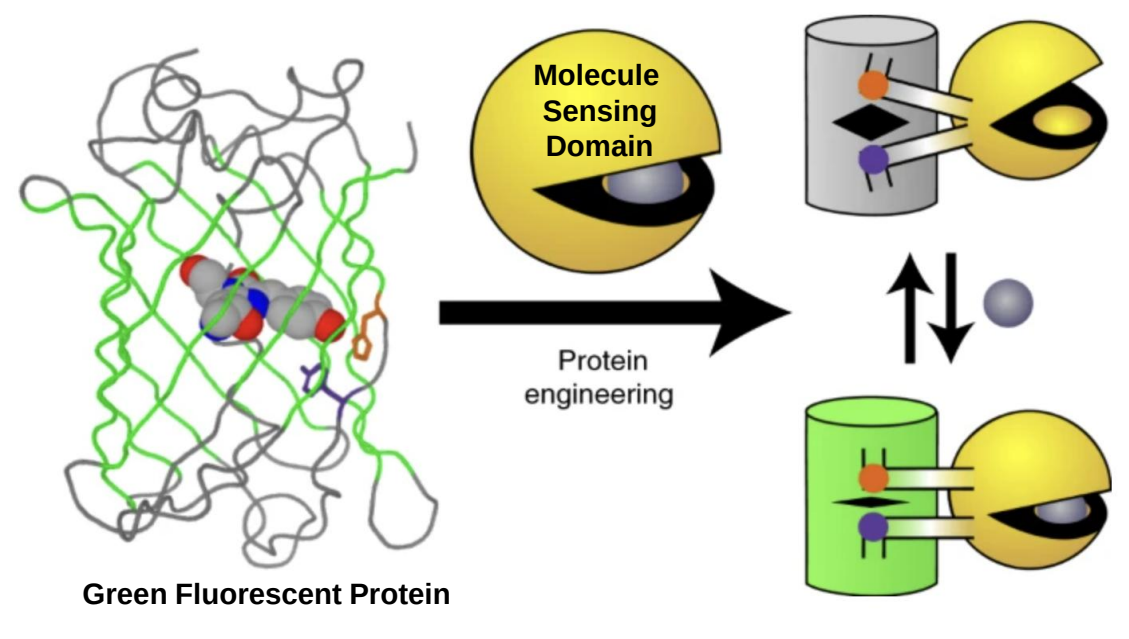
Cell Surface Receptor Signaling

This project is directed at determining the biochemical basis for how the cell surface receptors activation is transmitted to and interpreted by intracellular machinery to produce cellular responses.

These studies require a combination of approaches including: molecular cloning, cell culture, pharmacology, Western blotting, ELISA assays and imaging.

Project 3

Engineering Novel Chemical Biology-Based Sensors



Modified from Nasu, Y et al, Nat Chem Biol. 2021 17:509-518

The goal of this project is to produce new tools that allow us to monitor the biochemical activity occurring within living cells and tissue. The development of these unique sensors requires the collaboration of multiple research groups to produce the necessary synergy of biochemistry, structural modeling and cell biology.

These studies require a combination of approaches including: genetic engineering, molecular modeling, molecular cloning, cell culture, pharmacology, Western blotting, ELISA assays and imaging.