

# **Pathological cell extrusion therapy (PACETherapy)**

Pathological cell extrusion (PACE) is a novel key pathologic process in many organs and diseases in the gastrointestinal tract and eye. However, its mechanisms remain unsolved. Cell extrusion is the physical displacement of alive, healthy, damaged or dying cells from their original position within, or extending out from, the organ. This project will use a novel collection of experimental data collected from human cell and organoid models of the gastrointestinal tract (GIT): stomach (gastritis, cancer), intestine (inflammatory bowel disease), and colorectal cancer, and of the retina (age-related macular degeneration, AMD) to identify PACE molecular mechanisms. In particular, we will elucidate biophysical and mechanosignaling mechanisms that occur in PACE cells relative to healthy tissues. The resulting differential structural, biophysical and genotypic PACE fingerprints will open new avenues to develop effective therapies and biomarkers. Ultimately, we aim to uncover basic principles of PACE, and to translate data to improve patient care/outcome, even beyond GIT/retina.

The successful candidate should have training in bioengineering, biology, computer science, or physics, plus demonstrated interest in applying data science tools to understand biological control of cell decision making. Preference will be given to candidates with experience in RNA-seq transcriptome or other -omic data analysis.