

Faculty of Engineering

Summer Research Program 2022-2023

Project Title: Design and evaluation of nano-sensors for continuous glucose monitoring in cell cultures

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Objective

The main objective of this summer project will be to take our in-house developed nano-sensors and apply them to determine how glucose concentrations change inside and around cells under different stimuli (e.g. growth, stress, differentiation, infection).

Project Details

Cells require simple sugars such as glucose to produce energy through complex metabolic pathways (e.g. glycolysis). These pathways can be interrupted based on environmental stress, pathogen infection, etc. Nano-sized chemical sensors which can monitor the level of particular metabolites in this pathway (e.g. glucose, lactate, pyruvate) in a continuous manner, could help to unravel the complex biological interplay between metabolism, immunity and cellular health.

Students will gain skills in nano-science and mammalian/microbial cell culture, and will learn how to use a variety of instruments including fluorescence plate readers and microscopes for imaging cell cultures over time.

Prerequisites

Students with an interest in bio/medical engineering are encouraged to apply – experience with nanomaterials, sensors or cell culture would be preferred but not required.

Additional Information

Applicants will be required to attend an in-person or zoom interview to meet the project team.