NANYANG TECHNOLOGICAL UNIVERSITY

School of Biological Sciences

Reg. No. 200604393R

Research Theme: BioMedical Data Science/Computational Biology

Research Project Title: Advanced predictive models based on metabonomic profiling

Principal Investigator/Supervisor: Wilson Wen Bin Goh

Co-supervisor/ Collaborator(s) (if any):

Project Description

a) Background:

Metabonomic profiling has immense potential for biomarker discovery and also for disease staging, profiling and diagnostic/prognostic prediction. Recent advances in NMR and MS have further improved the resolution and reliability of metabolite profiling. However, analytical issues pertaining to batch effects, sample heterogeneity and noise still persist. This project aims to improve the resolution, reliability and reproducibility of metabonomic profiling using a combination of analytical chemistry and data science approaches. You will deploy the developed techniques on realworld problems (with data residing in our labs) such as cancer and mental illness.

b) Proposed work:

This project involves a combination of analytical chemistry and data science work. You will first gain practical familiarity with both NMR and MS data generation focusing first on experimental reproducibility. You will then generate benchmark data with known batch and noise effects, which we will then develop data science approaches for. We will focus on dealing with noise and batch effects. We will also work on improving algorithms for differentiating noise and meaningful signals. Finally, using in-house data, we will work on the use of integrating machine learning methods with metabolite profiling and investigate its added potential for accurate prediction over other omics platforms.

c) Preferred skills:

Highly motivated candidates with strong computing/mathematical/statistical skills and analytical chemistry skills are strongly encouraged to apply.

Supervisor contact:

If you have questions regarding this project, please email the Principal Investigator:
wilsongoh@ntu.edu.sg

SBS contact and how to apply:

Associate Chair-Biological Sciences (Graduate Studies) : AC-SBS-GS@ntu.edu.sg

Please apply at the following: http://admissions.ntu.edu.sg/graduate/R-Programs/RWhenYouApply/

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