

Research Theme: Synthetic biology

MSc Research Project Title: Genome-guided discovery of microbial natural products

Principal Investigator/Supervisor: Liang Zhao-Xun

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

Project Description

a) Background: Soil and marine microorganisms are renowned for their ability to produce structurally diverse specialized metabolites. Relying on a genome-guided approach, we aim to discover novel biosynthetic pathways and specialized metabolites encoded by unusual biosynthetic gene clusters. Focusing on phylogenetically unique soil and marine microbes isolated from the tropic environment of Southeast Asia, we employ a variety of genetic, biochemical, and synthetic biology tools to trigger or activate the biosynthetic gene clusters to produce the specialized metabolites. We expect the research to yield natural products with potent bioactivity or other interesting properties.

b) Proposed work: First, we usually need to sequence and mine the genome of the microbes to identify novel biosynthetic pathways. Next, we employ a variety of genetic, biochemical, and synthetic biology tools to manipulate the biosynthetic gene clusters to produce and modify the secondary metabolites. Finally, we conduct a wide range of anticancer, antimicrobial assays to test the bioactivity of the novel natural products.

c) Preferred skills: Basic molecular biology and biochemical skills.

Supervisor contact:

If you have questions regarding this project, please email the Principal Investigator:
{zxliang@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:

Application portal:

<https://venus.wis.ntu.edu.sg/GOAL/OnlineApplicationModule/frmOnlineApplication.ASPX>