Two 4-year Ph.D. student positions in Systems Biology

Nanyang Technological University, School of Biological Sciences, Singapore

Young and research-intensive, Nanyang Technological University (NTU) is ranked 11th globally. It is also placed 1st among the world's best young universities. NTU offers an excellent environment for research and training of scientific skills.

Systems Biology and Plant Evolution Group

The Systems Biology and Plant Evolution Group, headed by Asst. Prof. Marek Mutwil, studies gene networks to understand how genes work together to evolve traits such as secondary metabolites (e.g., morphine, caffeine) and cellulosic biomass (a source of biofuels). The group uses computational and wet-lab approaches to identify and characterize relevant genes, with the ultimate aim to be able to understand how traits evolve, and how to engineer and improve them.

Project 1 – Identifying biosynthetic pathways for high-value compounds

The goal is to computationally identify genes which biosynthesise high-value compounds. You will analyse genomic, transcriptomic and metabolomic data to uncover enzymes, transporters, and co-factors involved in the biosynthesis of secondary metabolites of plants. You will learn how to work with large data, and to develop guilt-by-association and machine learning algorithms and predictions needed to identify the relevant genes. The outcome of the project will allow unprecedented insights into biosynthetic pathways of high-value compounds, which is important for basic research and pharmaceutical and chemical industry.

Project 2 – Elucidating adaptive mechanism conferring resilience to environmental stress

The goal is to understand how adaptations to challenging environments evolved in plants. You will work with model plants, including algae, early land plants, and angiosperms, with the aim to understand how adaptations to abiotic stresses (e.g., heat and freezing) have evolved. To this end, you will generate transcriptomic and metabolomic data capturing the dynamics of adaptation to these stresses, and develop mathematical models to elucidate the evolution of these adaptations. The outcome of this project will expand our understanding of evolution and stress adaptation, which is important for basic research and agriculture.

What do we ask?

- You have a master's degree in molecular biology, biochemistry (or related) and keen interest in programming, algorithm development, mathematics, complexity, and puzzles;
- Or, master's degree in mathematics, physics, bioinformatics (or related) and are interested to learn plant cultivation methods;
- You have strong analytical and problem-solving skills;
- You have experience with programming (preferred Python), or high interest to learn it;

- You are proficient in spoken and written English, have excellent communication and writing skills and are interested in working in a highly interdisciplinary team of experimentalists, theorists, and computational scientists;
- You are independent, creative and have team spirit.

Why NTU?

Nanyang Technological University, Singapore is a young, research-intensive university that has earned a global reputation for academic and research excellence within a short span of time. A fast-rising university, NTU is ranked 11th globally in the Quacquarelli Symonds (QS) World University Rankings 2018 and has been placed No. 1 among the world's best young universities since 2014. With strengths in engineering, science, business, education, humanities, arts and social sciences, NTU delivers a holistic education to a cosmopolitan mix of undergraduate and postgraduate students representing about 100 nationalities. In partnership with Imperial College London, NTU has a medical school, the Lee Kong Chian School of Medicine. The lush NTU campus, named one of the top 15 most beautiful in the world, is home to about 33,000 students as well as 5,000 faculty and researchers.

Why Singapore?

Singapore is a city-state with one of the highest standards of living in the world seeking to become an international hub for the biomedical and life sciences. Singapore is a vibrant and safe tropical city, with rich Asian heritage and modern style of living, an ideal gateway to explore Asia. With our good base of life sciences players, highly skilled and educated workforce, excellent communication systems, good industry infrastructure and a stable government, Singapore offers an exceptional professional and personal experience.

Additional information:

For more information, please contact Asst. Prof. Marek Mutwil, e-mail: mutwil@mpimp-golm.mpg.de,

How to apply:

Application documents (cover letter, CV, diploma, description of research experience and motivation, names of at least two academic references) should be sent to Asst. Prof. Marek Mutwil. Only shortlisted candidates will be contacted.