

Research Theme: Diagnosis and Computational Biology

MSc Research Project Title: Volatile based diagnosis for pathogenic fungi

Principal Investigator/Supervisor: Dr HONG Yan

Co-supervisor/ Collaborator(s) (if any): Asst Prof Marek Mutwil

Project Description

a) Background:

Root rot diseases by pathogenic fungal species undermine the structural integrity of urban trees in Singapore. Existing diagnosis measures are inadequate for early and non-disruptive diagnosis of root rot diseases, bringing about the need to utilize modern technology for early warning, which will enable early mitigation.

b) Proposed work:

The MSc work will be part of the collaborative project between NTU and NParks aiming at developing early diagnosis for pathogenic fungi infecting our urban trees. The project has used metagenomics and metabolomics study of soil, fruiting body and disease tissues and gained a good knowledge on pathogenic fungi and their signature volatiles.

The MSc work will focus on developing sensitive and specific diagnosis for wood/root rot fungi based on their volatile profiles. You will mainly use the two complementary approaches:

1. Solid phase microfiber extraction (SPME) to capture and enrich volatiles followed by GC-MS analysis for volatile identity and relative quantity.
2. Electronic nose, a device with multiple arrays of chemo-resistive sensors (e-nose), with which volatiles will provoke series of signals that generate a pattern of recognition.

On top of field work and lab based experiments, you are also expected to do some programming and optimize algorithms for the most efficient and accurate e-nose diagnosis.

c) Preferred skills:

A good bachelor degree in Life Science, with laboratory experience and interest on horticulture. Should be self-driven and independent. Research experience on GC-MS, electronic nose, fungi culture and pathogenesis study will be advantageous.

Supervisor contact:

If you have questions regarding this project, please email the Principal Investigator:
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SBS contact and how to apply:

Associate Chair-Biological Sciences (Graduate Studies) : AC-SBS-GS@ntu.edu.sg
Please apply at the following:



School of Biological Sciences
College of Science

Reg. No. 200604393R

Application portal:

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