



Two PhD Student Opportunities at

School of Botany

The University of Melbourne



Project Title:

Identifying novel salinity tolerance mechanisms by spatial and temporal analysis of lipids in barley

Background:

A combination of climate change and poor agricultural practices signifies that 50% of current arable land will be saline and hence unusable by 2050. The identification of molecular mechanisms involved in salt tolerance of crop plants grown in saline soils will be necessary in order to ultimately develop novel salt tolerant germplasm. Evidence is accumulating that lipid signalling is an integral part of the complex regulatory networks in plants in response to salinity and drought. Modifications of membrane lipids through activity of phospholipases, lipid kinases and phosphatases such as phospholipase D (PLD) and diacylglycerol kinase (DAGK) that produce different classes of lipid and lipid-derived messengers. These provide spatial and temporal regulatory functions crucial for cell survival, growth and differentiation and for an appropriate response of the plant to environmental stimuli.

Aim of the project:

1. Use MALDI-FT-ICR-MS based imaging to determine spatial distribution of metabolites and lipids in barley tissues
2. Identification of novel mechanisms involved in salinity adaptation and tolerance by analysis of spatial and temporal distribution of lipids in barley
3. Identification of lipid based signaling networks within membranes and across root tissues involved in salinity adaptation and tolerance

Requirements:

Successful candidates are expected to meet the following requirements:

- Honours/M.Sc. degree in molecular biology, analytical chemistry, biochemistry, biotechnology or bioinformatics with excellent results, preferably with a multidisciplinary background. Having written a thesis on a topic related to the program, or proving to have experience or extensive knowledge of mass spectrometry methods is of advantage.
- Strong analytical capacity and ability to formulate views, ideas and concepts based upon complex information
- Excellent verbal and written English language and communication skills
- Ability to work independently; setting goals and priorities and plan research activities

Funding

All students are required to have a source of funding that covers the cost of university tuition fees and living allowance for their PhD commencing 2014.

Students who are not self-funded will need to obtain funds via a scholarship. Scholarships can be sourced from the University of Melbourne Scholarship website (<http://services.unimelb.edu.au/scholarships/research>).

Scholarships can also be sourced externally, such a student's home county or from various organisations.

Applicants need to mail their **motivation letter**, **full CV**, **academic transcript** with an overview of grades, and the **names and contact details of two referees** to:

A/Prof Ute Roessner
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Email: u.roessner@unimelb.edu.au