Australian Research Council Centre of Excellence for Plant Energy Biology and Grains Research and Development Scholarships at the University of Adelaide

The ARC Centre of Excellence in Plant Energy Biology (PEB) at The University of Adelaide is seeking PhD project applications from highly qualified and motivated students with a strong background in molecular biology and/or plant physiology. Two PhD projects are available. The projects are embedded within a program that will provide mentorship and opportunities for the students to engage with a wide range of research organisations, as well as exposure to the Australian grains industry. Prospective students should have a keen interest in working with stakeholders in the agricultural industry. The projects are supported by the Grains Research & Development Corporation (GRDC), which will provide PhD stipend ($25k p.a.) and research funding for each project.

PhD Project 1: Harnessing GABA signalling to improve crop performance

Multiple stresses lead to the rapid accumulation of GABA in plant tissues. GABA is a C:N metabolism intermediate that is used to bypass several stress sensitive steps of the TCA cycle (a major energy producing reaction). For instance, one of the major metabolic changes related to salinity is the upregulation of the GABA shunt pathway. We have recently discovered a mechanism by which GABA can also act as a stress signal in plants (Ramesh et al., 2015, *Nature Communications*), where we can inhibit GABA signals during stress to alter plant growth. We have identified wheat and barley varieties and mapping populations that vary in their salinity tolerance. This project will study how GABA metabolism and signalling relate to wheat varietal performance under saline conditions using proteomic, transcriptomic and metabolic screens. This project will identify new targets for manipulation and targeted breeding to improve salinity tolerance. This project will be based primarily in Adelaide (www.plantransig.com.au) and will involve collaboration with Nic Taylor and Harvey Millar at UWA (metabolomics and proteomics), and Jim Whelan at La Trobe (transcriptomics), and Steve Tyerman and Rachel Burton in Adelaide.

To apply, send your CV and cover letter by 1st Feb 2017 to:

Professor Matthew Gilliham Matthew.Gilliham@adelaide.edu.au

PhD Project 2: Improving yield stability with energy efficient root solute transport traits

Saline and water limited growing conditions often prevent cereals from reaching their genetic yield potential, but there are close cereal relatives that can grow in very dry and saline environments. The successful recipient of this scholarship will investigate traits in a diverse barley population that support plant fitness in dry and especially in saline conditions. This project will examine the genetic variation in the deposition of solute diffusion barriers in cereal roots in response to salinity. The student will screen a diverse barley population for genetic diversity in root barrier formation, examining both spatial differences and changes in composition, and explore the relationship with root growth, respiration and membrane transport regulation in control and saline conditions. Research will be based at the University of Adelaide with opportunities to collaborate with the group of Professor Harvey Miller at University of Western Australia to study root respiration.

To apply, send your CV and cover letter by 1st Feb 2017 to:

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