Developmental molecular biology of barley reproductive architecture

A BBSRC-funded PhD studentship is available in the Division of Plant Sciences at the University of Dundee, Scotland, to begin in October 2012. The Division is located at the James Hutton Institute, a premier plant science research facility and a centre of world-class research on barley.

This position is restricted to UK residents.

Background

To avoid increased land use and fertilizer application, improved crop productivity must derive from accelerated and predicative breeding for plant architectures yielding more grain. To do this, we need a molecular understanding of the developmental genetics underpinning plant architecture in cereals. In this project, you will work with groups at the University of Dundee and the James Hutton Institute (JHI) who are at the fore-front in using barley to study temperate cereal architecture. Due to the recent generation of genomic tools and resources for barley, many developed at the JHI, barley represents an ideal system to study the molecular developmental biology of a genetically tractable crop.

Project goals

This project focuses on reproductive development in barley, which is characterised by the development of an inflorescence or spike at the tip of the main shoot. Instead of leaves, the spike initiates reproductive units called spikelets which go on to develop grain. Although intimately associated with grain production, the molecular networks controlling barley spike growth are relatively unknown. Using a collection barely lines showing differences in spike morphology. We have identified a miRNA-targeted transcription factor essential for proper spike development. Your project will use both molecular genetic and biochemical approaches to uncover how this transcription factor regulates spike development and the role of miRNA regulation in this process. There is also scope to investigate how these mechanisms contribute to natural variation in spike growth amongst different barley cultivars.

Techniques and training

You will gain expertise and/or training in molecular cloning, electron microscopy and immunolocalisation, chromatin immunoprecipitation and gene expression platforms. This position would suit a student fascinated by the molecular mechanisms underlying developmental biology.

Work Environment and Contact Information

The Division of Plant Sciences is part of The College of Life Sciences at the University of Dundee which ranked as one of the top research institutes in Europe, renowned for elite, cutting-edge research, an impressive faculty and superb research facilities. The Division of Plant Sciences itself has a unique relationship with the JHI, one of the world centres of excellence in plant and crop genetics. As such the research environment is especially diverse, representing a distinctive cross-section among plant scientists from molecular biologists to agronomists.

Informal inquiries may be directed to Dr. Sarah McKim, sarah.mckim@hutton.ac.uk. Please see the advertisement at:

http://www.findaphd.com/search/ProjectDetails.aspx?PJID=39325&LID=420