

## Flipping the switch; AtS6K2 signalling during stress

A 3-year Leverhulme Trust funded PhD studentship is available, starting from February 2019, to work in the laboratory of Dr Filippo Prischi, Dr Ulrike Bechtold (University of Essex, UK) and Dr Marta Carroni (SciLife laboratories, Sweden). The successful applicant will be joining an internationally-renowned Research Centre

### **Scientific background**

All living organisms have adopted ways to maintain internal equilibrium and respond to stress factors. Consequently, they have evolved tightly regulated signalling pathways, which can sense changes in the environment and elicit a response. In plants, like in most eukaryotes, the p70 ribosomal S6 kinases (S6Ks) pathway coordinates cell growth, cell proliferation, and stress response. Studies in *Arabidopsis thaliana* (Arabidopsis) have shown that, similarly to in humans, the S6K family is composed of two members, called AtS6K1 and AtS6K2, which function differently. Little is known about AtS6K2 specific roles, despite initial evidences suggesting that it regulates responses to environmental stresses and developmental cues. The aim of this project is to unravel how AtS6K2 enables the plant to adapt to changes in the environment.

### **Research methodology**

The successful candidate will carry out a biophysical, biochemical and structural characterisation of AtS6K2. Protein complexes structures will be solved using X-Ray crystallography and single particle cryo-electron microscopy (cryo-EM). The atomic details obtained from the 3D structures will provide unique insights into how AtS6K2 is regulated, and will contextualise and rationalise *in vivo* and biophysical data, thus providing structure-function relationship. This project will set the base for future studies on the human kinase and on plant productivity.

### **Training**

This project is highly interdisciplinary and the successful candidate will develop skills in recombinant protein expression, protein purification, protein extraction from leaves, structural biology (X-RAY, SAXS and cryo-EM), and biochemical characterisation (SEC-MALS, fluorescence spectroscopy and SPR). As part of the scholarship the student will spend up to six months at the cryo-EM facility of SciLife in Stockholm to carry out data collection and analysis. In addition to hands-on practical research skills, generic professional skills development will be supported internally via Proficio, the innovative professional development scheme available at University of Essex, or externally via Diamond Light Source, CCP4 and BAC training courses.

### **Person specification**

Candidates should have a background in biochemistry and an interest in structural biology. Candidates must have, by December 2018, a degree in biological sciences, biochemistry, or a related area (a first or upper second class honours degree is desirable). A further qualification such as M.Sc. or M.Res. is advantageous

### **Funding**

The studentship covers tuition fees only for UK/EU nationals and provides a tax-free stipend of £14,777 per year.



# Biological Sciences

## ***Application process***

To apply, please send a copy of your CV, and covering letter describing why you are suitable for this PhD studentship directly to Dr Filippo Prischi ([fprischi@essex.ac.uk](mailto:fprischi@essex.ac.uk)) by **1<sup>st</sup> October 2018.**

