



Flipping the switch; regulating protein synthesis in response to stress – to start October 2019

Christine Desty Scholarship, fully-funded (Home/EU fees £4630 plus stipend of £15,009) for an MSc by Dissertation (MSD) in the School of Biological Sciences, University of Essex

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 AtS6K1 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 AtS6K1 enables the plant to adapt to changes in the environment.

Research methodology

The successful candidate will carry out a structural characterisation of AtS6K1, alone and in complex with different substrates. Proteins structures will be solved using X-Ray crystallography. The atomic details obtained from the 3D structures will provide unique insights into how AtS6K1 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 biochemical characterisation (SEC-MALS, fluorescence spectroscopy). 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.

Entry requirements and application procedures

Candidates should have a background in biochemistry and an interest in structural biology Applications should be submitted electronically by **24th April 2019** see here for details

<https://www.essex.ac.uk/pgapply/enter.aspx>

You are encouraged to contact the supervisor before application: fprischi@essex.ac.uk and ubech@essex.ac.uk If you have any queries with the online application process, please contact ecrix@essex.ac.uk

For general information about the School of Biological Sciences at the University please visit our webpages <http://www.essex.ac.uk/bs/>.

The University of Essex

The University of Essex is University of the Year - Times Higher Education (THE) Awards 2018. In the recent Research Excellence Framework 77% of research at the University of Essex research is 'world leading' or 'internationally excellent' (REF 2014). We offer world-class supervision and training opportunities and our research students work at the heart of an internationally-acknowledged and well-connected research community. In the 2013 Postgraduate Research Experience Survey, 84% of respondents said that they were satisfied with the quality of their research degree. At Essex we win awards for our pioneering student support schemes. We are the most recent winners of the prestigious *Times Higher Education* award for Outstanding Support for Students. Essex is a genuine global community. With more than 130 countries represented within our student body, and 40% of our students from overseas, we are one of the most internationally-diverse universities in the UK.