

PhD studentship at SynthSys and Simulistics Ltd. in Edinburgh



BBSRC iCASE: Predicting Plant Growth, from Genes to Organism.

We invite applications to a fully-funded, interdisciplinary PhD studentship, via the online application form: http://www.ed.ac.uk/studying/postgraduate/degrees?id=12&cw_xml=details.php

Please contact andrew.millar@ed.ac.uk for informal enquiries, citing the project title above.

Background: Understanding the growth of a plant in a changing environment is demanding, because plant development and metabolism respond sensitively to the local conditions. Crop Science models tackle the problem at a coarse level to predict field traits. Systems Biology models provide finer, mechanistic detail but usually for a limited sub-system. We have linked these two approaches to understand whole-plant growth, in the first 'Framework Model' of the laboratory model plant *Arabidopsis thaliana*. We recently validated the model in independent experiments. This project will develop the next-generation model, both as a tool for fundamental biology, and to enable synthetic biology designs that take account of the complex regulation in the plant host.

Approach: Modelling biological systems is a key strength in SynthSys, where we have local expertise in many different modelling approaches, as well as plant metabolism, development and genetic regulation. You will be trained on cutting-edge models from plant Systems Biology, plant development and crop science, building on the concrete example of our Framework Model. The model will be extended to represent larger, molecular networks that control biomass, working with international collaborators in plant science and the tools provided in Simulistics' Simile software. You will test the model in a range of new experiments, and have the opportunity to disseminate the model in the international crop modelling and systems biology communities.

Student profile: background in Biology, Geoscience, Agricultural Engineering or a suitably numerate discipline (e.g. computer science, engineering, applied maths or physics). Computer skills essential; programming experience desirable but not essential. Dual-expertise training provided in the interdisciplinary environment of SynthSys, with experience in Simulistics.

The supervisory team: Prof. Andrew Millar FRS, School of Biological Sciences (main supervisor); Prof. Vincent Danos, School of Informatics, Director of SynthSys; Dr. Robert Muetzelfeldt, Simulistics Ltd.



Further information:

www.amillar.org; www.synthsys.ed.ac.uk; www.simulistics.com.

Salazar J.D., Saithong T., Brown P.E., Foreman J., Locke J.C.W., Halliday K.J., Carré I.A., Rand D.A., Millar A.J. (2009) Prediction of Photoperiodic Regulators from Quantitative Gene Circuit Models. *Cell*, 139: 1170-1179.

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