



Industrial CASE Studentship Advertisement – 2023-24

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Project Title:	<i>Plant transporter biochemistry, biophysics, and inhibition for sustainable agriculture</i>

Brief description of project:

Organismal growth requires the movement of nutrients to appropriate tissues and organelles to feed numerous essential biochemical pathways. Consequently, transporters are implicated in numerous diseases and an emerging class of proteins for small molecule targeting. In plants, these transporters are unambiguously important to their physiology, and knocking out individual transporter genes is often lethal or severely impairing to crop, model, and weed species. Therefore, these proteins are obvious targets for new herbicides and enhancing plant health. However, biochemical and biophysical characterization is still required to exploit these proteins for agricultural benefit. This presents an exciting opportunity for a collaborative studentship of Syngenta and the University of Oxford, examining several essential transporters to describe their structures, biochemistry, physiology, and laying the groundwork for their chemical targeting.

This project leverages the complementary expertise, resources, and skills of the University of Oxford and Syngenta. Oxford's Centre for Medicines Discovery (CMD) will provide expertise in membrane protein structure, biochemistry, and small molecule targeting. Furthermore, this studentship will take advantage of the CMD's work characterizing and targeting related human transporters through the Resolute and EUBOpen projects. Syngenta is a leading developer of novel herbicides and crop protection products and will bring to the project expertise in plant physiology and inhibitor design. As part of this DPhil studentship, the candidate will have the opportunity to spend 3 months at Syngenta, a unique opportunity to get an insight into industrial research and to build a professional network. This research program is designed to ensure success via two parallel research tracks, with training and access to cutting-edge techniques and resources for molecular biology, protein biochemistry, and structural biology. Applying complementary skillsets will enable this student to quickly advance from protein targets to characterized biochemistry and plant physiology, structure-activity relationships of targeted small molecules, and established high-throughput assays.



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Attributes of suitable applicants:

- An undergraduate degree in chemistry, biology, plant biology, biophysics, biochemistry, or related field.
- Wet-lab experience.
- Familiarity or experience with protein expression and purification, protein biochemistry techniques, and/or protein structure analysis.
- Experience in analyzing complex data and using this information to plan the next step of your experiments.
- Excellent oral, presentation, and written communication skills.
- Self-motivated, well-organized, and flexible, with strong planning and problem-solving skills.
- Ability to work independently and as part of a team, and to collaborate with colleagues and external collaborators from industry.

Funding notes:

This project is funded for four years by the Biotechnology and Biological Sciences Research Council UKRI-BBSRC. UKRI-BBSRC eligibility criteria apply (<https://www.ukri.org/files/funding/ukri-training-grant-terms-and-conditions-guidance-pdf/>). Successful students will receive a stipend of no less than the standard UKRI stipend rate, currently set at £18,622 per year, which will usually be supplemented by the industrial partner

This project is supported through the Oxford Interdisciplinary Bioscience Doctoral Training Partnership (DTP) studentship programme. The student recruited to this project will join a cohort of students enrolled in the DTP's interdisciplinary training programme, and will participate in the training and networking opportunities available through the DTP. For further details, please visit www.biodtp.ox.ac.uk. The DTP and its associated partner organisations aim to create a community that is innovative, inclusive and collaborative, in which everyone feels valued, respected, and supported, and we encourage applications from a diverse range of qualified applicants.