



Dr Richard Bourne

Industrial Fellowships Scheme

Dr Richard Bourne is a lecturer in the School of Chemistry at the University of Leeds. From 2015 to 2016, he used a Royal Academy of Engineering Industrial Fellowship to collaborate with AstraZeneca on the development of a new automated continuous reactor platform.

“This Fellowship gave me an opportunity to demonstrate the research that had been developed within my research group in an industrial setting.”

RESEARCH

Dr Bourne’s research focuses on the development of new sustainable processes that support the manufacture of chemical compounds for drug development. His particular interest is in automated flow systems that combine online analysis with self-optimising algorithms to rapidly achieve optimum conditions.

Continuous flow processes are more cost-effective than traditional methods and the pharmaceutical industry has become increasingly interested in their use. Having spent several years developing an automation platform for rapidly developing processes, Dr Bourne was keen to demonstrate its potential at an industrial site. The Fellowship at AstraZeneca provided an opportunity for him to do this.

“AstraZeneca was a natural fit as it had complex chemical syntheses that require substantial optimisation,” explains Dr Bourne. “Due to limited patent lifetimes and the high costs of optimisation, the use of automation to more rapidly develop processes was of high interest to the team at AstraZeneca. It fully supported the project, dedicating staff and funding to jointly develop the new reactor platform.”

IMPACT

The Fellowship enabled Dr Bourne and his collaborators to construct a new automated continuous reactor platform. This is now firmly established and in regular use at AstraZeneca’s site in Macclesfield.

“The Fellowship allowed me to demonstrate the use of self-optimising reactor systems to more rapidly develop routes to active pharmaceutical ingredients,” he says. “The results from this platform have been used to develop new processes at a manufacturing scale.”

The project has also led to several new collaborations that seek to further advance the platform’s capabilities.

The project was part of a wider set of collaborative activities between AstraZeneca and the University of Leeds. A strategic partnership has developed between these organisations, ensuring their collaboration for several years. Dr Bourne has also used the experience to incorporate contemporary examples into his undergraduate teaching, which have been positively received by his students.

PROFESSIONAL DEVELOPMENT

Dr Bourne continues to collaborate with AstraZeneca on related projects and he credits the Fellowship as having supported him in securing a permanent lectureship with AstraZeneca. Novel insights gained through the collaboration have also benefited his research group.

“The Fellowship enabled me to get a truly industrial perspective of the challenges faced during process development. This has been very useful when preparing applications to funding bodies. It has also led to several further projects including PhD studentships supported by AstraZeneca.”

ROYAL ACADEMY OF ENGINEERING INDUSTRIAL FELLOWSHIP SCHEME

The Industrial Fellowship scheme provides an invaluable opportunity for early- to mid-career academics to undertake a collaborative research project in an industrial environment. The scheme aims to strengthen the strategic relationship between the university and the industry host by providing an opportunity to establish or enhance collaborative research between the two parties and enhance the quality of teaching.