Dr Tuck Seng Wong is a senior lecturer in the Department of Chemical and Biological Engineering at the University of Sheffield. He was awarded a Royal Academy of Engineering Industrial Fellowship in 2016 to collaborate with Croda on sustainable processes for manufacturing chemicals.
RESEARCH
Dr Wong was supported by a Royal Academy of Engineering Industrial Fellowship to bring his research expertise in enzyme engineering, biocatalysis and synthetic biology to a collaboration with Croda, a leading chemicals manufacturer. He worked with the process innovation team to find novel ways to maximise efficiency, and reduce the environmental impact, of manufacturing processes at multiple sites across the globe. This often needed a multidisciplinary approach as Croda produces high-performance chemicals for use in a diverse range of products across healthcare, plastics and engine lubricants.

With experience at the interface of biological sciences and chemical engineering, Dr Wong brought a unique perspective to the collaboration. “During my secondment, I investigated the applicability of enzymes, and the development of enzymatic processes, for sustainable manufacturing of industrial chemicals for personal care and healthcare,” he explains. “I also investigated the possibility of using engineered microbes for CO₂ capture and utilisation.”

IMPACT
The collaboration helped Croda gain a better understanding of how to draw on academic expertise to tackle research challenges faced by industry. During the Industrial Fellowship, Dr Wong also used his academic network to connect Croda with other relevant technological experts.

It also strengthened links between the University of Sheffield and Croda, as Dr Wong was the first academic to be seconded there. “The University of Sheffield is committed to transferring knowledge generated from our research to our industrial partners and helping to develop regional industries,” continues Dr Wong. “I would now consider Croda a strategic partner of my research.”

As a senior lecturer, it was also important for Dr Wong to share his industrial insights in the classroom.

“My Industrial Fellowship has allowed me to participate in cutting-edge industrial innovation, steer my research to tackle key challenges and extend my professional network.”

“Gaining industrial experience has enhanced my competence in teaching,” he says. “I can now apply real-world examples in core engineering modules and in a new module focusing on transferable skills to help us with preparing ‘work-ready’ engineers.”

PROFESSIONAL DEVELOPMENT
Through the Fellowship, Dr Wong established a strong partnership with Croda, and their joint interests in sustainable manufacturing has enabled this to continue. To advance some of the work initiated during the Fellowship, Croda has co-funded two PhD students in Dr Wong’s research group.

Dr Wong also used the experience to establish a strong network of colleagues in industry, a beneficial resource for discussing research ideas. Croda has also supported him and participated in grant applications, providing further opportunities for the collaboration to continue.

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.