

Chemistry Departmental Seminar

Thursday 6th February

4.00 pm, Physics Lecture Theatre, Science Concourse

'Making light work of biological catalysis: supporting and sustaining life on planet Earth'

There are only three natural light-dependent enzymes in Nature. This presentation will focus on the mechanisms and exploitation of two of these enzymes. The first, protochlorophyllide oxidoreductase is responsible for the biosynthesis of chlorophyll. The second, fatty acid photodecarboxylase, has important uses in generating next generation biofuels, in particular liquefied petroleum gas (bio-LPG). This presentation will cover both fundamental and applied aspects of biological photocatalysis by reference to these two enzymes, illustrating how photochemistry can be harnessed to drive important cellular transformations and used to develop new microbial strains able to biosynthesise gaseous alkanes. Scaled production with these engineered microbial strains offers routes to sustainable fuels. Insight into how this is being pursued through commercial ventures will also be discussed.

Prof Nigel Scrutton

University of Manchester

BIOGRAPHY: Nigel is Director of the UK Future Biomanufacturing Research Hub funded by EPSRC/BBSRC and a Founding Director of the fuels-from-biology company C3 BIOTECH Ltd. He is also Director and PI of the BBSRC/EPSRC funded Synthetic Biology Research Centre 'SYNBIOCHEM'. He was previously Director of the Manchester Institute of Biotechnology (MIB) (2010-2019). Under his leadership as MIB Director, the enterprising vision of MIB was recognised by the award of the Queen's Anniversary Prize for Higher and Further Education (2018-20) as 'a leader in the UK's strategic development of biotechnology and bio-manufacturing, through innovative technologies in partnerships with industry'. Nigel's group is noted internationally for its contributions to catalysis science, especially in the fields of quantum biology (especially QM tunnelling), dynamics and biocatalysis, mechanistic and synthetic biology, and bio-based chemicals/fuels manufacture. His work is interdisciplinary at the interfaces of chemistry, biology and physics, supported by a genuinely world-leading infrastructure for biophysical chemistry and synthetic biology that he has established in MIB.

