Industrial Biotechnology in the Development of Advanced Materials

Workshop to be held 16th – 17th January 2017 at The Principal Manchester (formerly, Palace Hotel) Oxford Road, Manchester

Advanced materials have either superior mechanical, physical or chemical properties, or have lower environmental impact in use or in manufacture, when compared with traditional materials. Advanced materials have been acknowledged as key enablers to economic and societal development, and are one of the UK Government's "Eight Great Technologies" and are vital to address global grand challenges in health, low carbon transport and sustainable energy production.

Innovation in materials involves multi-disciplinary science, has cross-cutting impacts on other technology areas (e.g. nanotechnology, photonics), and enables novel advanced manufacturing techniques. Industrial biotechnology (IB) plays a key role in the development and manufacture of entire classes of material by use of enzymes and biotransformations that access novel chemistries, allow tailorable selectivities and use more benign reaction conditions. IB has revolutionised our ability to synthesise molecules of choice, and has made huge strides into industrial catalysis, pharmaceutical manufacture and biofuel production.

This workshop looks at how enzyme-based IB can improve materials' manufacture, by improving process sustainability or by enhancing product functionality. The products may be produced or modified by enzymatic routes, or may include the enzymes as a main functional element of the end product.

The workshop aims to match IB solutions to the challenges presented by industrially focussed researchers. Target applications include, but are not limited to:

Organic coatings

- Corrosion resistance/protection
- Anti-fouling (e.g. biofilm prevention or degradation)
- Drop-in replacements for heavy metals and solvents (e.g. paint curing)

Polymers

- Sustainable manufacture (e.g. monomers from renewable feedstocks)
- Functionalisation (particularly where biology gives access to novel functionality)
- Chemical control (e.g. improved tacticity, stereo- and regioselectivity, and reactivity control in co-polymers)
- Biodegradable polymer manufacture (e.g. polysaccharides, polyesters for medical use)

Smart Materials

- Sensing and transduction (e.g. biosensors, bioelectronics and functional textiles)
- Reactive and self-healing materials (e.g. self-repairing composites and adaptive implants)

Life Cycle Engineering

- Functionalisation (e.g. textile finishing, paper processing)
- Improved recyclability: degradation of abiological materials (e.g. carbon fibre)

The UK is a recognised international leader in both IB and advanced materials. New partnerships between these fields could unlock funding for interdisciplinary research, including the five-year, £1.5bn Global Challenges Research Fund; BBSRC industrial CASE studentships; and Innovate UK calls related to manufacturing and materials.

This workshop is sponsored by BIOCATNET, a BBSRC network in industrial biotechnology and bioenergy (NIBB). BIOCATNET offers pump-priming funds in the form of business interaction vouchers and proof-of-concept awards.

BIOCATNET will be launching a report and companion briefing document in spring 2017 on the opportunities for IB in the development of Advanced Materials. A working paper will be provided to attendees prior to the event, and the contribution of delegates is sought *via* the public outputs of this workshop.

Please note that due to the limited availability of places, registration for this event is by application. Submission of an application form does not guarantee acceptance. Please submit your application form at: http://industrial_biotechnology_for_advanced_materials.eventbrite.co.uk

Registration for this event is free and includes food and refreshments, a networking reception & dinner, and overnight accommodation in **The Principal Manchester** hotel on the night of 16th January 2017. Please request accommodation and tell us whether you will be attending the Networking Reception and Dinner when you register.

Please note that charges may be incurred in the event of non-attendance: if for any reason you are unable to attend, please contact the organisers as soon as possible.

If you would like to register interest in giving a 5-minute flash presentation, then please provide a short title and summary during registration. Due to time constrains, it may not be possible to offer time to everyone who registers interest. The organisers will contact you to inform you of the outcome.

Please note that due to BBSRC rules you will only eligible for free registration if you are a member of BIOCATNET at the time of the event. Membership of the network is free of charge and does not require further commitment to attend events. Please see www.biocatnet.com/join for registration and T&Cs.

Organising Committee (University of Manchester)

Professor Stephen Yeates – School of Chemistry [Chair]

Dr. Mark Corbett – CoEBio3

Dr. Christopher Blanford – School of Materials

Dr. Kirk Malone – Sir Henry Royce Institute for Advanced Materials

www.coebio3.org

www.royce.ac.uk