

CoEBio3

Centre of Excellence for Biocatalysis, Biotransformations and Biocatalytic Manufacture



Biological Catalysis – A Gateway to Industrial Biotechnology

MIB 20th June 2010

Industrial Biotechnology – A Disruptive Technology

The ***rational design and construction of engineered biocatalysts and multi-enzyme pathways*** that are capable of the efficient conversion of simple, low-cost renewable feedstocks (*e.g.* cellulose, lipids, waste biomass) to high value end products (*e.g.* pharmaceuticals, agrochemicals, cosmetics, personal health care, fuels, biomaterials etc.)

IB and will require the interaction of the disciplines of synthetic chemistry, synthetic biology, systems biology and process engineering.

The transition over the next 7-15 years from a trial-and-error to knowledge based approach, in which a much higher level of prediction can be incorporated into product manufacture, represents a huge scientific & commercial opportunity for the UK

CoEBio3: Highlights 2005 -

- CoEBio3 established in 2005 with a remit of undertaking basic and applied R & D in collaboration with academe & industry
- Research Club: Phase I (£1M) and Phase II (£0.6M) involving up to 18 companies
- 1:1 Collaborative Projects (£5M) e.g. Shell, BASF, Croda, AstraZeneca,CSIRO
- FP7 Funded Projects (£5M)
 - BIOTRAINS (Marie-Curie Training Network)
 - AMBIOCAS (amine synthesis using transaminases)
 - SUPRABIO (biorefinery project with 17 partners)
- TSB High Value Chemicals Programme (AMRI)
- Research Council Funding (BBSRC, EPSRC etc.)

Management Team



2.

CoEBio3 Central
Management Team



Nick Turner

Paul Goddard

John Whittall

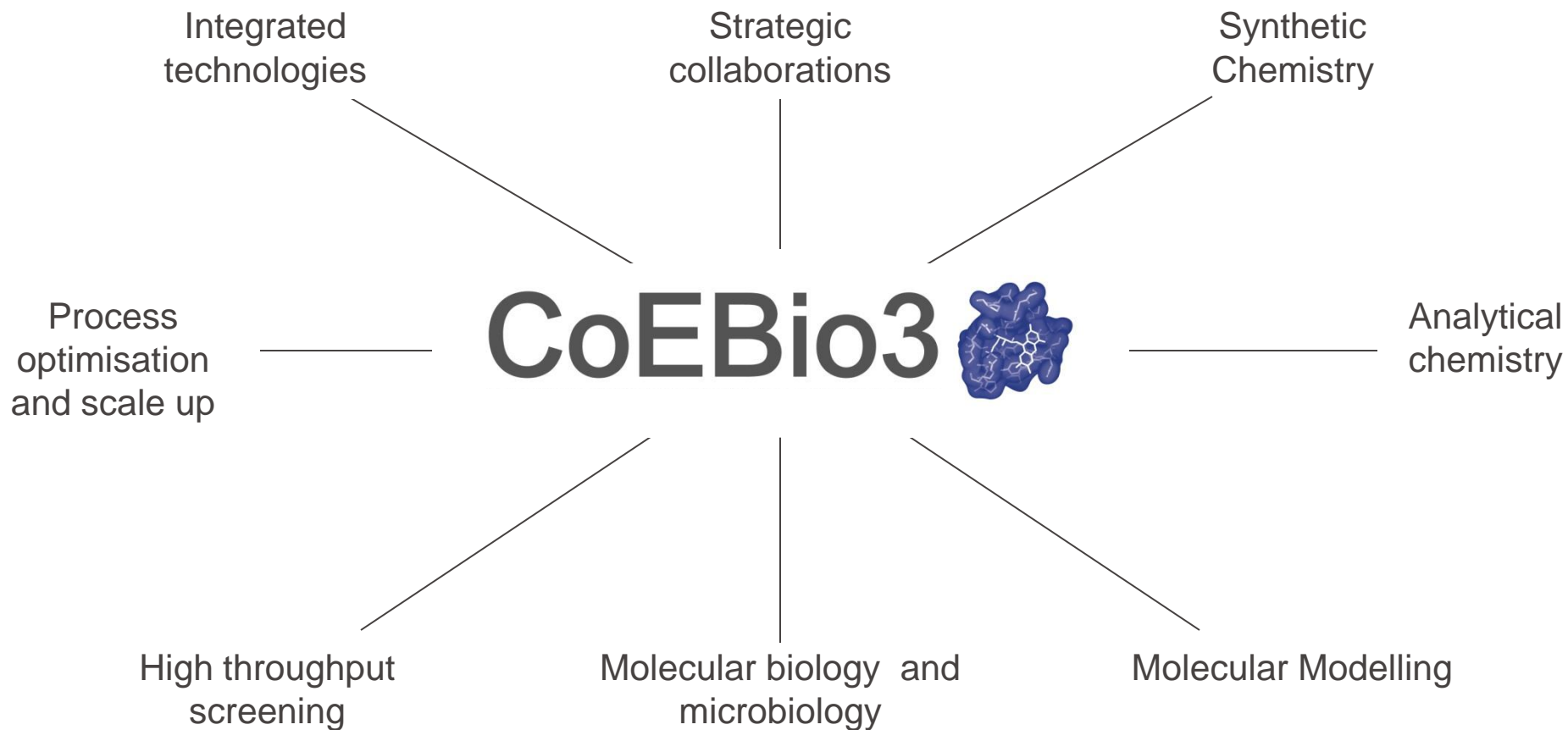
Ian Rowles

Kirk Malone

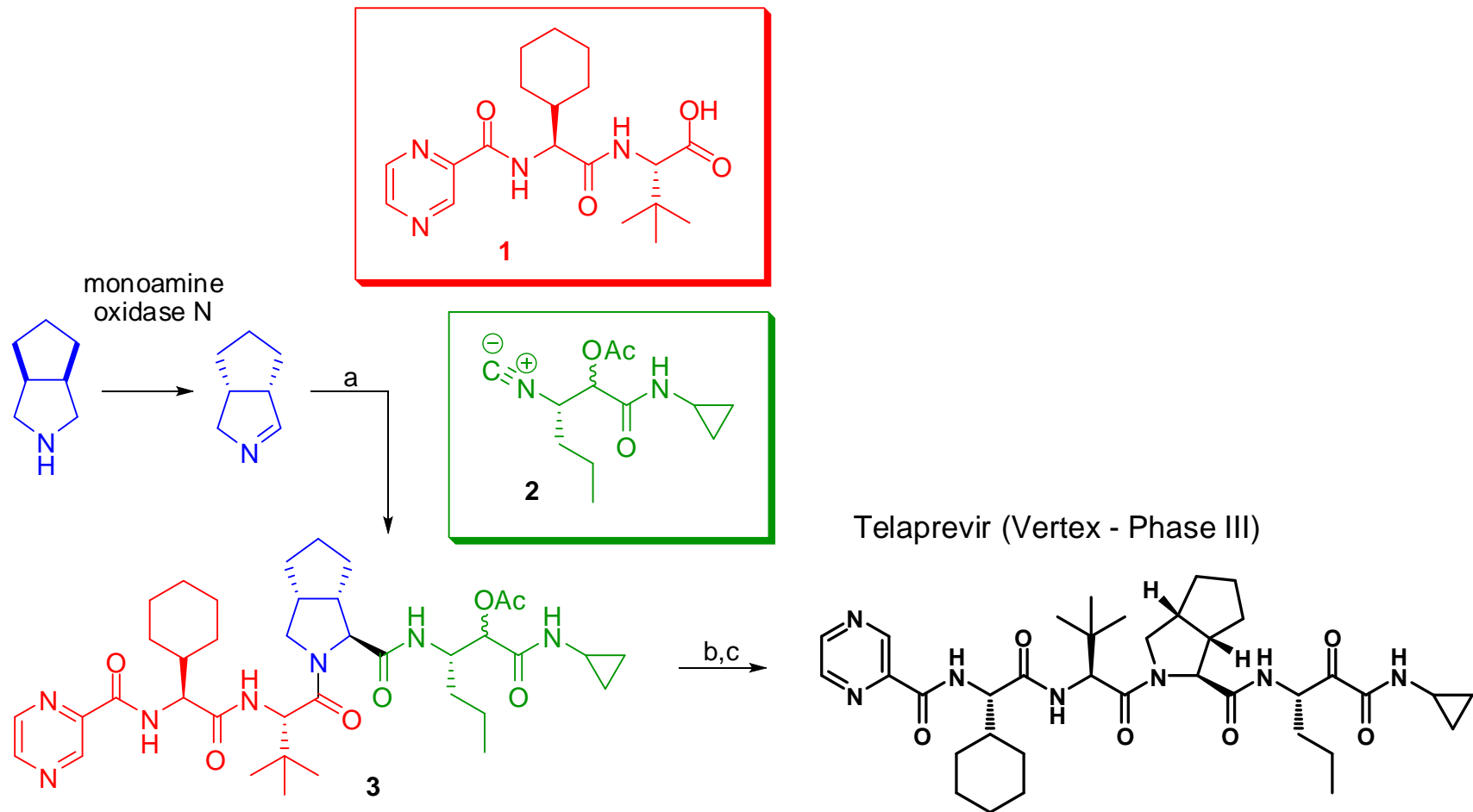
Paula Tipton



CoEBio3 Core Capabilities



Case Study: biocatalytic multi-component synthesis of telaprevir



V. Koehler, N.J. Turner *et al.*, *Angew. Chem. Int. Ed.*, 2010, 49, in press.

R. Orru, N.J. Turner *et al.*, *Angew. Chem. Int. Ed.*, 2010, 49, in press.

National Centre for Industrial Biotechnology (NCIB)

Our vision is to create the leading Centre in the world for enabling and promoting the commercialisation of **Industrial Biotechnology (IB)** across a range of sectors important to the UK economy.

The Centre will establish new mechanisms for IB commercialisation, identified in the Government's 2009 Innovation and Growth Team report, thereby enhancing the ability of companies to compete in a potential £360 billion global market.

The Centre will bring together internationally recognised UK academic groups to deliver an innovative 'genes to kilos to tonnes' manufacturing philosophy and to train the individuals necessary to implement this vision.

'Hub-and-Spoke' Model for Centre for IB

Manchester

**(Chemistry, Enzymology,
Biotechnology, Chem Engineering):**

Berrisford, Flitsch, Leys, Lloyd,
Micklefield, Munro, Scrutton,
Sutcliffe, Turner, deVisser, Webb



UCL

(Bioprocess Engineering):

Lye, Dalby, Hailes

York

(Plant genomics):

Bruce, Grogan



Strathclyde

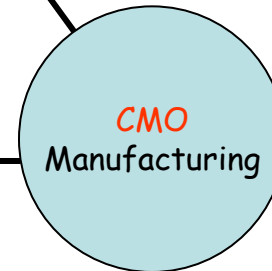
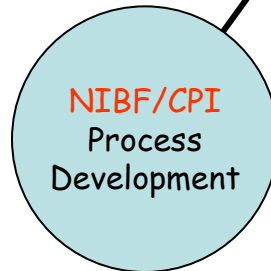
(Biocatalyst Development):

Halling, Moore, Ulijn

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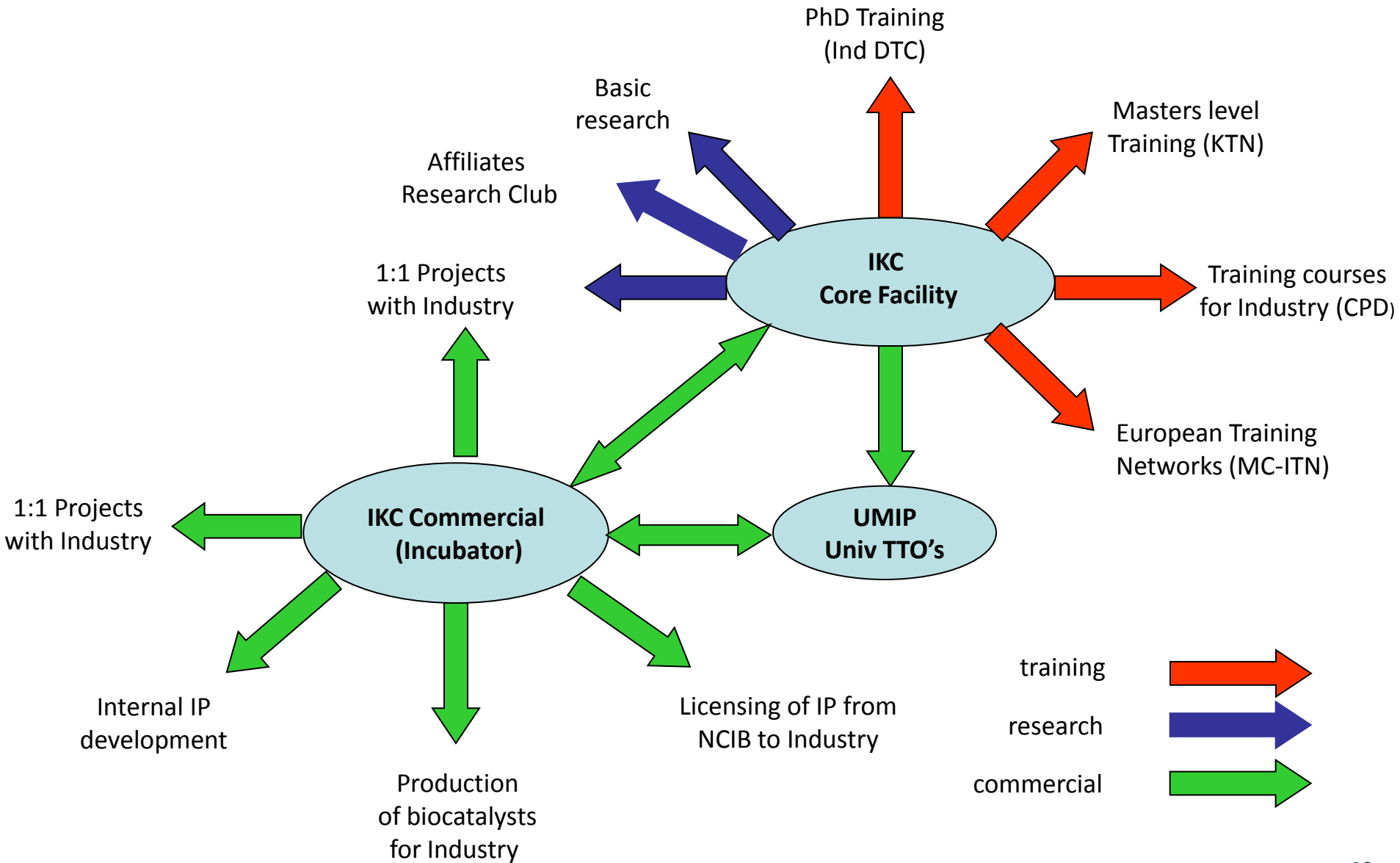
Halling, Moore, Ulijn



NIBF/CPI

(750L – 10m³ demonstrator):

Structure of Centre for Industrial Biotechnology



Academic & Business Partners – Thank You

