



Networks in Industrial Biotechnology & Bioenergy (BBSRC NIBB)

Activities update, March 2017



Overview

In 2013-14, BBSRC, with support from EPSRC, committed £18M to fund 13 unique collaborative Networks in Industrial Biotechnology and Bioenergy (BBSRC NIBB). The BBSRC NIBB launched in January 2014.

The BBSRC NIBB are fostering collaborations between academia, industry, policy makers and NGOs in order to find new approaches to tackle research challenges, translate research and deliver key benefits in IBBE. Each network has a particular focus area, mainly within the UK, but with interest to build international links.

These multidisciplinary networks are driving new ideas to harness the potential of biological resources for producing and processing materials, biopharmaceuticals, chemicals and energy. The Networks provide Proof of Concept funding, Business Interaction Vouchers and are open to new members.

By October 2016, the BBSRC NIBB collectively represent over **2600 UK based academic members** and have engaged with nearly **750 different companies**.

This activities update highlights upcoming Network events and showcases the most recent Proof of Concept and Business Interaction Vouchers that have been funded through the BBSRC NIBB.

This update will be produced on a quarterly basis and made available on our BBSRC NIBB webpage www.bbsrc.ac.uk/bbsrcnibb

Further details relating to the individual BBSRC NIBB can be found on their individual websites or the BBSRC webpage detailed above.

Upcoming Network events – January – December 2017

- 28 February –1 March – FoodWasteNet Fruit and Vegetable Waste Valorisation Funding workshop in Birmingham
- 5-7 April – LBNet Challenges and opportunities in Lignocellulosic biorefining: science, policy and economics in Cheshire
- 6 April – ADNet Novel feedstocks workshop in Lincoln
- 12 April – Joint Network Careers Fayre at the University of Sheffield
- 26 April – ADNet & C1Net joint Gas Mass transfer workshop location tbc
- 2-3 May – IBCarb UK & Latin America workshop on Glycobiotechnology Tools for Human Health in Manchester
- 11-12 May – PHYCONET Cyanobacterial Biotechnology: technologies to applications to products in London
- 21-23 May – IBCarb How to commercialise your research and turn your glycoscience into a glyco-biotech start up Part II in Manchester
- 7 June – FoodWasteNet Valorisation of Grain, Cereal & Bakery Waste at the University of Reading
- 7-8 June – CBMNet Membrane engineering of lipids and proteins in Glasgow
- 29–30 June – NPRONET The Chemistry and Biology of Natural Products Symposium XI at the University of Warwick
- 3-4 July – ADNet Early Career Researcher conference in Birmingham
- 3-4 July – FoodWasteNet Process Design Tools (Intelligen SuperPro) Training at University of Reading
- 13 July – HVCfP Utilising genetic resources in R&D training event in York
- Late Summer – PHYCONET Annual Conference – date tbc, late August/early September
- 10-11 September – BioProNET supported STARS skill school at CPI Darlington
- 12-13 September – IBCarb Bioactive Polysaccharides in Cambridge
- 12–14 September – CBMNet & Biocatnet joint event Import and export of small molecules into cells for biocatalysis in Edinburgh
- 10-11 October – BioProNET 4th annual science meeting in Warwick
- 19 October – HVCfP Annual meeting in Manchester

Upcoming BBSRC NIBB Funding calls 2017

- 1 March – Metals in Biology PoC call closes
- 6 March – Metals in Biology BIV call closes
- 15 March – PHYCONET BIV call closes
- 16 March – P2P Summer studentship bursary call closes
- 20 March – FoodWasteNet PoC call closes
- 31 March – CBMNet PoC call closes
- 31 March – PHYCONET Undergraduate Summer Studentships call closes
- 18 April – Biocatnet PoC call closes
- 24 April – FoodWasteNet BIV call closes
- 26 April – HVCfP BIV call closes
- 2 May – PHYCONET Training & Conference funding call closes
- 26 May – BioProNET final call for BIV and POC calls close
- IBCarb BIV applications to be submitted by 14th to be evaluated that month
- ADNet Quarterly BIV Calls [end of month March, June, September, December 2017]
- HVCfP Quarterly BIV calls [April 2017, July 2017, October 2017, January 2018]
- NPRONET BIV deadline every 2nd Friday of the month, final PoC call Summer 2017

Details of Proof of Concept projects awarded by the BBSRC NIBB between March 2016 and December 2016 can be found in **Annex 1**. Older awards are listed in the September 2015 and March 2016 updates.

Proof of concept projects awarded by the Networks are a maximum of 12 months in duration, £100k value and funds are paid by BBSRC at FEC 80%.

Details of Business Interaction Vouchers awarded by the BBSRC NIBB between March 2016 and December 2016 can be found in **Annex 2**. Older awards are listed in the September 2015 and March 2016 updates.

Business Interaction Vouchers are a maximum of 6 months in duration, up to £10k value and are designed to facilitate interactions between academics and industrialists.



www.bbsrc.ac.uk/bbsrcnibb

nibb@bbsrc.ac.uk



Annex 1: BBSRC NIBB Proof of Concept projects awarded March 2016 to December 2016

Network	PoC title	Primary Investigator	Institution
Biocatnet	Predictive sequence-activity landscapes of biocatalysts via random forests and deep learning	Kell, Douglas	University of Manchester
Biocatnet	'Smart' amine donors for efficient and cost-effective scale-up of biotransformation employing ω -transaminases.	O'Reilly, Elaine	Manchester Metropolitan University
Biocatnet	Establishing the potential of biosynthetic urea---synthetases as industrial biocatalysts	Corre, Christophe	University of Warwick
Biocatnet	Bio CO2	Marriott, Ray	Bangor University
BioProNET	Can archaeal minimicrosome maintenance helicases enhance the performance of a nanopore DNA sequencer	Plevin Michael	University of York
BioProNET	Developing a toolkit for determining the manufacturability of new therapeutics in CHO cells	Peden Andrew	University of Sheffield
C1Net	Exoelectrogenic Intensification of CO2/ H2 Fermentations using O2 as Final Electron Acceptor	Condrie, Alex	University of Nottingham
C1Net	Development of an assembly-based, recombineering pipeline for overcoming recalcitrance to DNA transfer caused by RM systems in C1 chassis	Minton, Nigel	University of Nottingham
C1Net	Towards improved bioprocess kinetics for C1 feedstock fermentation in acetogens	Warren, Martin	University of Kent
C1Net	Microbubble enhanced gas exchange in a methanotroph gas fermenter	Zimmerman, William	University of Sheffield
CBMNet	Engineering Exosome Production by CHO Cells	James, David	University of Sheffield
CBMNet	Identification of Membrane Transporters of Lignin monomers	Dixon, Neil	University of Manchester
CBMNet	A potent synthetic biology strategy for increasing transporter-mediated terpenoid efflux from E. coli	Kell, Douglas	University of Manchester
CBMNet	An enhanced platform for translocation of biotherapeutics to the E. coli periplasm	Robinson, Colin	University of Kent
CBMNet	The role of HMA and COPT proteins in trans membrane movement of palladium	Maathius, Frans	University of York
CBMNet	Membrane stability models in the presence of methacrylate esters	Bonev, Boyan	University of Nottingham
CBMNet	Construction of glucose transporter mutants of Clostridium beijerinckii	Avignone Rossa, Claudio	University of Surrey
CBMNet	Modelling of multifactorial solvent stress on membranes	Goddard, Alan	University of Lincoln
CBMNet	Bacterial mimicking liposomes	Briscoe, Wuge	University of Bristol

CBMNet	Investigating the role of periplasmic and transmembrane domains of mechanosensitive channels in E.coli membrane integrity	Miller, Samantha	University of Aberdeen
FoodWasteNet	Supercritical CO2 extraction & enzyme-modification of leaf waxes from brassica waste to produce novel film antitranspirants for increasing crop drought tolerance	Kettlewell, Peter	Harper Adams University
FoodWasteNet	Assessment of Ice Cream Waste as a Feedstock for Higher Value Applications	Bruce, Neil	University of York
FoodWasteNet	Assessment of Food Waste Feedstocks for the Production of Novel Antifungal Compounds through Fermentation	Cartwright, Jared	University of York
FoodWasteNet	Viability of obtaining biopharmaceuticals from eggshell waste	Perry, Carole	Nottingham Trent University
HVCfP	Production of the lipid-soluble antioxidant Canolol in cruciferous oilseeds	Eastmond, Peter	Rothamsted Research
HVCfP	The development of high PROVITAMIN A (B-carotene) producing tomato lines Acronym: PROVITA	Fraser, Paul	Royal Holloway University of London
HVCfP	Differentiating plant cell factories	Nakayama, Naomi	University of Edinburgh
IBCarb	Defining and designing optimized IgE glycoforms	Wagner, Gerd	King's College London
IBCarb	Acoustic separation of polysaccharides from micro-algal cells	Stevenson, Adrian	University of Cambridge
IBCarb	Sweet Biocatalysis: Mining for Sugar Aminotransferases from Clostridia	O'Reilly, Elaine	University of Nottingham
IBCarb	Towards engineering a fluorescent, glycosylation-responsive reporter	Polizzi, Karen	Imperial College London
IBCarb	Identifying novel enzymes for the modification of an industrially produced polysaccharide	Green, David	Scottish Association for Marine Science
LBNet	Engineering pathways for targeted lignin degradation in C. necator towards the production of pyridine dicarboxylic acids as bio-polymer monomers.	Bryan, Sam	University of Nottingham
LBNet	Advanced Biorefining for High Value Chemical Production	Zhang, Ying	University of Nottingham
LBNet	Assessing the suitability of wood pellets for use in biorefining to produce fuels, chemicals and electricity	McQueen-Mason, Simon	University of York
Metals in Biology	Metal supply and the production of non-canonical amino acids during protein overexpression	Chivers, Peter	Durham University
P2P	Evaluation of the thermo-mechanical pulping of biomass to facilitate release of fermentable sugars for advanced biofuel production	Charlton, Adam	Bangor University
P2P	BREATHABOARD: Developing and up-scaling an innovative cropbased alternative to gypsum plasterboard	Walker, Peter	University of Bath
P2P	Exploring the component value of Brewery Spent Grains (BSG) by wet fractionation	Leak, David	University of Bath
P2P	Hemp by-product valorisation using cannabinoid extraction followed by ethanol fermentation	McQueen-Mason, Simon	University of York

PHYCONET	High value chemicals from algae: Developing a transgene-free genome editing toolbox to enhance carotenoid production	Molnar, Attila	University of Edinburgh
PHYCONET	Accelerating the biotechnological potential of marine microalgae using a molecular networking comparative metabolomics approach	Duncan, Katherine	The Scottish Association of Marine Science
PHYCONET	Identification of algal extracts with anti-cancer activity	Michaelis, Martin	University of Kent

Annex 2: BBSRC NIBB Business Interaction Vouchers awarded March 2016 to December 2016

Network	BIV title	Primary Investigator	Institution and company
ADNet	Comparison of Biological and Mechanical Processes to Generate Value from Digestate	Lawrence, James	University College London Roam Agency
ADNet	Evaluation of an integrated aerobic-anaerobic microbial system for enhanced degradation of biopolymers	Patterson, Tim	University of South Wales Loowatt Ltd
ADNet	Optimising the use of separated anaerobic digestate fibre as a substrate for mushroom cultivation	Noble, Ralph	East Malling Research G's Fresh
ADNet	Improving the sustainability of Anaerobic Digestion by demonstrating the potential of digestate fibre to reduce peat usage in horticultural growing media.	Stainton, David	University of Lincoln Beeswax Farming Ltd, AE Lenton Biogas
ADNet	Youlgrave Community Land Trust (YCLT) organic waste micro-AD feasibility study and case for support	Styles, David	Bangor University Youlgrave
ADNet	Evaluating the feasibility of fish waste co-digestion with MSW in Stornoway	Heaven, Sonia	University of Southampton Western Isles IWM Facility
ADNet	Towards engineering microbial communities to treat a defined waste stream	Soyer, Orkun	University of Warwick Mara Renewables, Algal Omega 3
ADNet	The development of digestible Plastics	Radu, Tania	Loughborough University AquaPak polymers, Biffa Environmental
ADNet	Leckford Estate organic waste AD feasibility case study and environmental impact analysis	Zhang, Yue	University of Southampton John Lewis Partnership
Biocatnet	Biocatalytic synthesis of a diketone	Black, Gary	Northumbria University Robinson Brothers Ltd
Biocatnet	Review and Ranking of Biocatalytic Routes for the Sustainable Production of a Number of Organic Compounds	Turner, Michael	University of Manchester AkzoNobel
Biocatnet	Evaluation of alcohol oxidases for preparation of aldehyde intermediates for pharmaceutical manufacturing	Turner, Nicholas	University of Manchester GSK

Biocatnet	Enabling metabolic pathway engineering in Clostridium within a new BASIC DNA assembly framework.	Baldwin, Geoff	Imperial College London Chain Biotechnology Ltd
Biocatnet	Industrial applicability of blue multicopper oxidases to direct methanol fuel cells	Blanford, Christopher	University of Manchester C-Tech Innovation
BioProNET	Novel bioprocessing approaches for the separation of product phases	Winterburn, James	University of Manchester Croda
BioProNET	Examining the relationship between charge state and zeta potential in proteins using mass spectrometry; implications for formulation of biologics	Barran, Perdita	University of Manchester BioShape
C1Net	An assessment of feasibilities and challenges for methane to be used as feedstock for a sustainable bioeconomy	Zhang, Ying	University of Nottingham Sasol UK Ltd
CBMNet	Replacing osmotic downshocks with upshocks for periplasmic protein extraction	Pilizota, Teuta	University of Edinburgh FujiFilm
CBMNet	Bioinformatic-Based Design of Engineering Strategies to Increase CHO Cell Biomass Accumulation Rate	James, David	University of Sheffield Lonza
CBMNet	Condition-specific engineering of Pseudomonas metabolism	Angione, Claudio	Teesside University TeeGene Ltd
CBMNet	Investigation into impact of increasing periplasmic volume upon industrial fermentation systems.	Mulvihill, Dan	University of Kent Fuji Film
CBMNet	Investigation into using a novel method for generating recombinant outer membrane vesicles for secretion of biopharmaceuticals during industrial fermentation.	Mulvihill, Dan	University of Kent Fuji Film
CBMNet	Efflux from bacteria of feedstocks for industrial manufacture	Henderson, Peter	University of Leeds Lucite
CBMNet	Testing a prototype engineered bacterial flagella Type III Secretion System for 'true' protein secretion in biotechnology --- a Proof of Concept study	Stafford, Graham	University of Sheffield FujiFilm
CBMNet	Optimization of influenza vaccine manufacturing through modification of cellular membrane organization.	Rossmann, Jeremy	University of Kent MatTek Coporation
CBMNet	Development of Clostridium saccharoperbutylacetonicum transposon mutagenesis	Fagan, Robert	University of Sheffield Green Biologics
CBMNet	Molecular structures and interactions of bacterial outer membranes: Rational antimicrobial agent design in personal care product formulation	Briscoe, Wuge	University of Bristol Procter and Gamble
CBMNet	SMALP technology: unlocking membrane proteins for drug discovery	Dafforn, Tim	University of Birmingham MedImmune
CBMNet	Membrane stability and disruption by chimeric antimicrobial peptides	Bonev, Boyan	University of Nottingham DuPont UK

FoodWasteNet	Microwave-assisted extraction of pectin from potato pulp waste	Binner, Eleanor	University of Nottingham Branston Ltd
FoodWasteNet	Finding value in root vegetable waste	Burgess, Karl	University of Glasgow Cellucomp Ltd
FoodWasteNet	Food preservation active from waste	Tverezovskaya, Olga	Bangor University Pennotec (PennogLtd); Monaghan Mushrooms Limited; Co-operative Group
FoodWasteNet	An investigation of insect frass biodiversity as a function of food waste diet	Hirsch, Penny	Rothamsted Research Entomics Biosystems Ltd
FoodWasteNet	Isolation and characterisation of functional and nutritional phospholipids from underutilised dairy co-streams	Gray, David	University of Nottingham Roil Foods
FoodWasteNet	Extracting novel actives from AD digestate through bio-processing for use in agriculture/horticulture	Papadopoulous, Apostolos	University of Lincoln Muntons plc
FoodWasteNet	Assessment of feasibility in using insect oil and chitosan in developing a holistic method of green solvent production	McGregor, James	University of Sheffield Entomics Biosystems Ltd
HVCfP	Generation of novel aroma active compounds from waste plant material for use in the flavouring and fragrance industry	Fisk, Ian	University of Nottingham BioBean Ltd
HVCfP	Improving the anti-malarial and anti-cancer properties of a natural product	Wright, Colin	University of Bradford Oxford Biotrans Ltd
HVCfP	Discovery of a systemic bio-fungicide derived from the Asteraceae family	Rose, Peter	University of Lincoln Crop Intellect ltd
IBCarb	Exopolysaccharide Production in Cyanobacteria	Amtmann, Anna	University of Glasgow GlycoMar Ltd
IBCarb	Radically different enzyme specificities using distant homologues	Flitsch, Sabine	University of Manchester Prozomix
IBCarb	Market report: Glycoenzymes for Food & Beverages	Flitsch, Sabine	University of Manchester Biocatalysts Ltd
IBCarb	Application of glycan arrays in bioprocessing	Flitsch, Sabine	University of Manchester MedImmune
IBCarb	Step---change profiling of industrially important plant glycan structures through DNA sequencer---Assisted Saccharide analysis in High throughput (DASH)	Dupree, Paul	University of Cambridge Iceni Diagnostics
IBCarb	Design and construction of a low-cost, HD webcam based sensitive fluorescence detector for the biochemical identification and quantification of biologically relevant carbohydrates by strong anion exchange and reverse phase HPLC analyses.	Skidmore, Mark	Keele University MI Engineering

IBCarb	Enzymatic Tailoring of Polysaccharides for use in Next-Generation Additive Manufacturing of Bioelectronic Tools and Technologies Underpinning Biological Research	Hardy, John	Lancaster University Neu Drive Ltd
IBCarb	Optical multiplexed detection of lectins and enzymes	Field, Rob	John Innes Centre Cambridge Display Technology
LBNNet	High-throughput industrial enzyme analysis and optimisation of DASH for commercial research service	Dupree, Paul	University of Cambridge Novozymes AS
LBNNet	Testing of bacterial lignin degraders for delignification of distillery spent lees for anaerobic digestion	Bugg, Tim	University of Warwick Clearfleau
LBNNet	Feasibility of extracting value from lignocellulose held in complex matrix waste materials	Wagland, Stuart	Cranfield University Ecoganix
LBNNet	Levoglucosan and cellobiosan utilisation for bioethanol production. (a preliminary investigation)	Leak, David	University of Bath Nova Pangaea
Metals in Biology	Investigating uptake and catalytic potential of miscanthus grown on palladium mine wastes	Bruce, Neil	University of York AgriKinetics Ltd
Metals in Biology	Microbial recovery of metals from contaminated Miscanthus used in the industrial remediation of degraded landscapes	Chuck, Chris	University of Bath Terravesta Limited
Metals in Biology	Investigating the antimicrobial properties of copper infused fabrics	Keevil, Bill	University of Southampton Copper Clothing Limited
Metals in Biology	Bioaccumulation of platinum from waste	Carney, Helen	Teesside University TeeGene Biotech Ltd
Metals in Biology	Embedding technical expertise in the optimisation of trace metal supplementation strategies for successful biomethane production	Zhang, Yue	University of Southampton Tropical Power Ltd
NPRONET	Discovery of potential pyrrolizidine natural products by genomic scanning of actinomycetes from NCIMB culture collection	Deng, Hai	University of Aberdeen NCIMB Ltd
NPRONET	Biosurfactant production by yeasts belonging to the genus Pseudozyma	Roberts, Ian	Institute of Food Research Croda
NPRONET	Genomics-enabled novel biocatalyst identification and characterisation	Black, Gary	Northumbria University CHAIN biotech Ltd
NPRONET	Improving the efficiency of natural product expression and purification in bacterial strains of pharmaceutical relevance by biomimetic culturing	Van Keulen, Geertje	Swansea University Demuris Ltd
P2P	A method of concentrating gamma-linolenic acid (GLA)	Chuck, Christopher	University of Bath A&R House (BCL)
P2P	The study of biochar as a carrier for POP-degrading inoculants	Sohi, Saran	University of Edinburgh Forest Research
P2P	Biomass based ion-exchange water cleaning system	Winters, Ana	Aberystwyth University Pennotec

P2P	A Computational Study of Extraction Capabilities of Microbubbles for Process Intensification	Bandulasena, Hemaka	Loughborough University Perelemax
P2P	Towards a separative bioreactor for cellulosic biofuel production	Bandulasena, Hemaka	Loughborough University Perelemax
P2P	Identification of suitable <i>Geobacillus</i> spp for the commercial production of lactic acid from MSW derived platform sugars	Leak, David	University of Bath Fiberight
P2P	From Plant to Product: Developing stimuli-responsive plant-derived biomaterials for wound healing	Hardy, John	Lancaster University Spheritech Ltd
PHYCONET	Optimisation of algal culture for the production of human milk fat substitute	Eastmond, Peter	Rothamsted Research Algenuity
PHYCONET	Developing synthetic biology tools for <i>Spirulina</i>	Purton, Saul	University College London Algaplex Ltd
PHYCONET	Increasing algal growth and harvesting efficiency in glasshouses using LED lighting and centrifuges	Smith, Alison	University of Cambridge Plessey Semiconductors Ltd Alfa Laval Ltd (UK)
PHYCONET	Efficient cell lysis for extraction of intracellular products from microalgae using pulsed electric field	Vaidyanathan, Seetharaman	University of Sheffield C-Tech Innovation Ltd