

Designer Biology 2025

July 29-31, 2025 Newcastle, UK



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Bioengineering
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Scientific Programme

Tuesday 29 July 2025

13:00-13:50 Registration and lunch

Session 1

13:50 – 14:00 Organiser's welcome address

14:00 – 14:50 **Keynote lecture:** Systems metabolic engineering to establish novel chemistries in bacteria

Pablo Ivan Nikel, DTU Biosustain, Denmark

14:50 – 15:10 Metabolic engineering to enhance biohydrogen production from agricultural lignocellulosic waste

Ariadna Vidal, Newcastle University, UK

15:10 – 15:30 Advancing lung cancer treatment through the engineering of masked molecules and mycoplasma pneumoniae

Karolina Guzauskaite, Centre for Genomic Regulation (CRG), Spain

15:30 – 16:00 *Coffee break and meet the speaker*

16:00 – 16:20 A two-step cell-free platform integrating DNA aptamers and SHERLOCK nucleic acid detection to identify cyanotoxins and bacterial species respectively

Madeline Sanderson, Newcastle University, UK

16:20 – 16:40 Development of an optogenetic modular lytic system in *E. coli* based on phage-derived lytic proteins as a light-controlled and safe delivery platform

Annapaola Petrosino, Fondazione Istituto Italiano di Tecnologia, Italy

16:40 – 16:50 Transforming wastes to fragrances: valorising fatbergs for sustainable fragrance production

Cordelia Kao, University of Edinburgh, UK

16:50 – 17:00 **Sponsor talk**

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Tuesday 29 July 2025

17:00 – 17:30 Flash poster talks

17:30 – 19:00 Poster session and reception

Wednesday 30 July 2025

09:00 – 10:00 *Coffee and registration*

Session 2

10:00 – 10:40 **Invited talk:** Engineering *Pseudomonas* as biotech chassis for the sustainable production of chemicals and materials

Nick Wierckx, Forschungszentrum Jülich, Germany

10:40 – 11:00 Biological upcycling of polyester waste for sustainable chemical synthesis

Joanna Sadler, University of Edinburgh, UK

11:00 – 11:10 Chorismate-derived production of bulk chemicals and secondary metabolites in engineered *Pseudomonas taiwanensis* VLB120

Franziska Kofler, Institute of Bio- and Geosciences IBG-1: Biotechnology, Forschungszentrum Jülich, Germany

11:10 – 11:20 A recombinant silk-elastin-keratin-like protein as potential cosmetic ingredient

André da Costa, SOLFARCOS-University of Minho, Portugal

11:20 – 12:00 *Coffee break and meet the speaker*

12:00 – 12:20 Engineering bacterial cells for down-stream separation and protein purification

Gavin Melaugh, University of Edinburgh, UK

12:20 – 12:40 From laboratory to market: the role of odorant binding proteins in cosmetics

Filipa Gonçalves, SOLFARCOS-University of Minho, Portugal

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Wednesday 30 July 2025

12:40 – 12:50 Investigating the effect of dioxygenase enzyme technology and valorisation of the aqueous phase of catalytic pyrolysis bio-oil production

Kathleen Bialik, Newcastle University, UK

12:50 – 14:00 Lunch and poster session

Session 3

14:00 – 14:40 **Invited lecture:** The yeast toxicome: a potential source for new antifungals for food, health and biotech applications

Sonja Billerbeck, Imperial College, United Kingdom

14:40 – 15:00 Unleashing the potential of non-model yeasts in biotechnology: genetic toolbox development for enhanced strain engineering

Behide Saltepe, The Novo Nordisk Foundation Center for Biosustainability, Technical University of Denmark, Denmark

15:00 – 15:20 Integrating *in silico* design and *in vivo* screening to engineer interactions in synthetic protein complexes

Barbora Jankovičová, Masaryk University, Czech Republic

15:20 – 15:30 Fungal biofilms as tunable living membranes for wastewater treatment

Asma Ahmed, University of Nottingham, UK

15:30 – 16:00 *Coffee break and meet the speaker*

16:00 – 16:20 Peptide-keratin interactions for enhanced hair properties

Artur Cavaco Paulo, SOLFARCOS-University of Minho, Portugal

16:20 – 16:40 Biotechnology of functional proteins and peptides for hair cosmetic formulations

Ana Tinoco, SOLFARCOS, Pharmaceutical and Cosmetic Solutions, Portugal

16:40 – 16:50 Turning my gaming computer into a desktop protein designer

Max Richardson, Newcastle University, UK

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Wednesday 30 July 2025

16:50 – 17:00 Testing design principles for codon compression and refactoring of the *Chlamydomonas reinhardtii* chloroplast genome

Pawel Mordaka, University of Cambridge, UK

17:00 – 20:00 *Poster session and social activity*

Thursday 31 July 2025

Session 4

9:00 – 10:00 Registration

10:00 – 10:40 **Invited talk:** Thinking soils: towards pressure responsive microbial induced calcite producing engineered living material

Meng Zhang, Northumbria University, UK

10:40 – 11:00 Designing multilayer multi-cell-type sheets and tubes

Jamie Davies, University of Edinburgh, UK

11:00 – 11:20 Microbial pigment production for self-dyeing bacterial cellulose leather through a one-pot co-culturing approach

Kate Gilmour, Living Construction, Northumbria University, UK

11:20 – 12:00 *Coffee break and meet the speaker*

12:00 – 12:20 Programming green light-responsive hydrogels: from photo-weakening to photo-unresponsiveness and photo-strengthening

Saskia Frank, University of Münster, Germany

12:20 – 12:30 Sustainable microbial production of chemicals from waste carbon sources

Annemette Kjeldsen, University of Edinburgh, UK

12:30 – 12:40 Recent developments in skin health: prebiotic-coated absorbent articles

Öznur Özlem İbrahimoğlu, Hayat Kimya, Turkey

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12:40 – 12:50 Electrospinning of bacterial cellulose: towards functional and sustainable bio-Textiles

Subhadeep Paul, Northumbria University, UK

12:50 – 13:00 OT-Mation: an open-source code for parsing CSV files into python scripts for control of OT-2 liquid-handling robotics

Thomas Howard, Newcastle University, UK

13:00 – 14:00 Lunch and poster session

Session 5

14:00 – 14:50 **Keynote lecture:** Toward a world of electrogenetics

Martin Fussenegger, ETH Zurich, Switzerland

14:50 – 15:10 Programmable biological matter at the nanoscale

Jonathan Heddle, Durham University, UK

15:10 – 15:30 Self-building cells: an enzymatic route to artificial cell assembly

Andrea Belluati, TU Darmstadt, Germany

15:30 – 16:00 *Coffee break and meet the speaker*

16:00 – 16:10 Theoretical investigation on the catalytic reactivity of artificially modified CviUPO

Hanna-Friederike Poggemann, Ulm University Institute of Electrochemistry, Germany

16:10 – 16:20 Engineering cells and redox signalling for electronic surveillance and control

William Bentley, University of Maryland, USA

16:20 – 16:40 The genetic architecture of allosteric plant hormone receptors

Maximilian Stammnitz, Centre for Genomic Regulation (CRG), Spain

16:40 – 17:00 Prizes and closing remarks



Flash poster presentations

Stress, strain & catalytic gain: mechanosensitive hydrogel with lifespan control via microfracture-mediated enzyme diffusion through polyelectrolyte multilayers

Xaneva Elorriaga George, Newcastle University, United Kingdom

A synthetic enzyme system for polyolefin degradation: expressing rhodococcus oxidative enzymes in *Bacillus subtilis*

Harriet Taylor, Newcastle University, United Kingdom

Exploiting a natural translational regulator as a secretion stress biosensor

Eszter Csibra, University of Leeds, United Kingdom

Achieving programmable plant immunity through de novo protein design

Gregory Knight, Centre for Programmable Biological Matter, Department of Biosciences, Durham University, United Kingdom

Development of synthetic tools to accelerate genetic engineering and uncouple growth from heterologous gene expression in *Pseudomonas*

Sebastian Köbbing, RWTH Aachen University - Institute of Applied Microbiology, Germany

Processing environmental signals through modular biosensors

Crislaine K. S. Rocha, Centro Nacional de Biotecnología, Spain

Making an IMPRINT on *Ideonella sakaiensis* domestication: advancing transformation of the first PET-catabolizing non-model microbe

Victoria Sajtovich, Max Planck Institute for Terrestrial Microbiology, Germany

Ethical and eco-friendly: engineering mycelium leather to replace animal and plastic-based leathers

Amani Chalak, Northumbria University, United Kingdom