

ENVIRONMENTAL BIOTECHNOLOGY NETWORK

Themes Report





WELCOME

Welcome to the Environmental Biotechnology Network (EBNet) Activities Update.

In 2014 BBSRC launched 13 Networks in Industrial Biotechnology and Bioenergy (NIBB). These were succeeded in 2019 by [phase two](#), consisting of 6 new sister-NIBBs. The Networks aimed to foster collaboration between academic researchers and businesses at all levels, using excellent research to tackle challenges and help deliver key benefits in industrial biotechnology and bioenergy. With the support of BBSRC, and with additional funding from EPSRC for some Networks, each NIBB organised conferences and events, provided funding for Proof-of-Concept (POC) projects and collaboration with businesses whilst also offering a route for individuals to network, share expertise and contribute.

Within [EBNet](#) our community of academics and industry is dedicated to **engineering microbial systems for environmental protection, bioremediation and resource recovery**. These systems include microbes in anaerobic digestion & biorefineries, wastewater treatment and those that bio-degrade plastics, oil or other emerging pollutants. We encompass three interrelated [themes](#): *Pollutants and media* covering both traditional and emerging pollutants; *Biosciences to engineering* to develop and improve technology for pollution control, resource recovery and bioenergy generation; *Technology interfaces* for process integration, techno-economic and sustainability assessment.

Over time we have built a membership of more than 1300 members consisting of 56% Male/41% Female/1% Other. We covered a wide range of institutions with members from over 100 Universities across the UK. 74% of our members are from the HEI sector. The remainder come from industry, research organisations, NGOs and Government etc. Our [monthly Newsletter](#) has a 34% open rate, with 70% from within the UK. We've reached hundreds of people through LinkedIn, X (formerly Twitter), Eventbrite and YouTube. Our followers have been provided timely, tailored updates on the latest opportunities in Environmental Biotechnology.

Thanks to our funders we have been able to support a broad range of research projects, covering topics integral to our core themes. We are grateful for the efforts of our small army of volunteer reviewers who laboured behind the scenes to evaluate bids and inform our assessment panel. Likewise, we appreciate the generosity of our industry panel members who have devoted time to read through bids and then help inform our panels' decision-making. As a result, over 100 POC bids were evaluated leading to 14 [funded projects](#) across 10 universities. In addition, our 7 Business Interaction Vouchers (BIV) have helped to engage industry with academics to investigate specific challenges.



WELCOME ctd

Impact from our activities can be measured not just in publications and career progression but also in the formation of 13 specialist [Working Groups](#) (WG) set up *by members for members*. These cover topics from *Aerobic Granulation Processes* to *Social Sciences and Environmental Biotechnology*. Each has evolved independently, based around the specific interests and needs of its members - resulting in a wide array of activities and results. We expect to see more progress in these fields, as a continuing benefit from the formation of an active core of enthusiasts!

EBNet has organised a host of events and activities – most open-to-all, some specific to specialist groups and yet others held jointly with other NIBBs or organisations. Our biggest events have supported our large Early Career Researcher (ECR) membership with six annual ECR conferences. Our webinars have had international reach, with invited speakers from across the globe sharing up-to-date expertise with members. Other workshops and conferences have sought to connect different research communities and groups to foster stronger collaborations.

As part of our general outreach, we have contributed articles to trade associations and participated in industry events. To become more accessible, we created various competitions designed for wider public participation (including photography and short story competitions). An array of articles, books and reports will act as resources going forward. Recognition for Environmental Biotechnology as a developing field has been a focus for the work of our Social Science WG whose report can be accessed [online](#).

Building on our conferences, we have dedicated attention and effort to our ECR membership by providing international conference travel bursaries, placement funds and further opportunities to get involved via the ECR Scientific Committee. Our friendly, supervisor-free, academic conferences have helped hundreds of researchers to network and showcase their research to a receptive audience. It has been a privilege to see the work being conducted by research groups across the UK. By providing a forum for researchers from different universities but related fields we have connected people at the very start of their careers. Meanwhile, our [ECR WG](#) – composed of ECRs - has worked hard to provide numerous opportunities for targeted career and professional skills support. Nurturing this geographically dispersed talent pool can only be beneficial to a developing UK IB base.

We are optimistic that you will find something of interest in our Activities Updates. There are vibrant and active research communities working everywhere in Environmental Biotechnology. As this NIBB comes to a close, keep an eye out for more opportunities to stay professionally connected via initiatives like the [Environmental Biotechnology Innovation Centre](#) (EBIC), the [National Biofilms Innovation Centre](#) (NBIC) and other new hubs. Or contribute to a professional association or society like the [Microbiology Society](#), [CIWEM](#), [CIWM](#) or the [Royal Society of Chemistry](#). In the fast-moving field of Environmental Biotechnology, maintaining strong professional connections is more important than ever.



Outputs and Impacts

Supported research

EBNet funded [Proof of Concept \(PoC\)](#) awards and [Business Interaction Vouchers \(BIV\)](#) through calls between 2020 and 2024. We also provided our ECR members with [Travel Bursaries](#) to support conference attendance and placements.

BIV

BIV are intended to support interactions between academia and industry to research a specific industry need. Lasting up to 6 months, these awards required a matching contribution from industry in the form of cash and in-kind support. With up to £20k available we enabled 7 companies to connect and engage with relevant academic expertise.

POC

Our 14 Proof of Concept awards allocated £750k to novel or innovative research topics. With a success rate of around 15%, there was no shortage of good ideas to choose from. Drawing on the good will of a multitude of volunteer reviewers and the expertise of our Management Board members, we were able to assess bids from a series of funding calls open to all BBSRC-eligible academics in the UK. Our broad remit is reflected in the diverse array of funded projects. Three awards attracted our maximum level of funding at £100k:

Fibre Highways: translocation of the microbiome for pollutant bioremediation - a cross-disciplinary collaboration between Dr Angela Sherry, Northumbria University and Dr Jane Scott, Newcastle University which looked at translocation of the microbiome along 'fungal or fibre highways' to facilitate pollutant biodegradation.

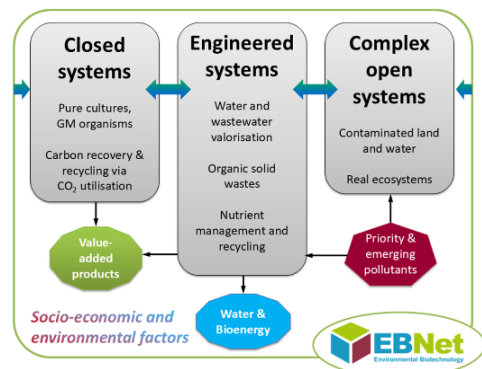
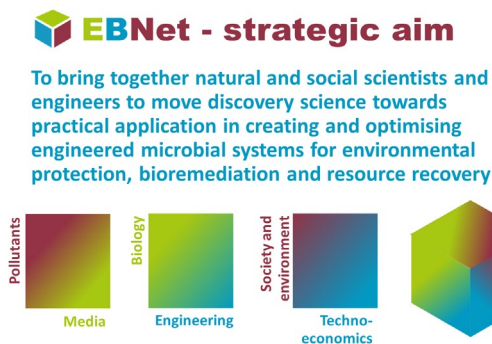
Pure biomethane - rather than biogas - from a single waste stream – a cross-disciplinary collaboration between Dr Elizabeth Heidrich, Newcastle University and Dr Jan Dolfing, Northumbria University which combined anaerobic digestion with a bioelectrochemical reactor to separate gaseous products.

Mitigating N2O emission from wastewater treatment processes – a joint cross disciplinary collaboration between Dr Bing Guo, University of Surrey and Prof Tao Chen, University of Surrey which looked at the challenges facing mitigation of N2O emissions, e.g., monitoring and measurement, data quality, biological mechanisms, and understanding process factor impact and control points.

[Outputs](#) from our awards are now coming through in the form of publications and follow-on funding.

Themes

From the start of the Network, EBNet's activities were structured around three themes: **Pollutants & media** – covering the range of priority and emerging pollutants that enter the environment and accumulate in water, on land and in the biosphere. **Biosciences to engineering** – understanding complex microbial systems in order to develop new processes and optimise existing ones for application in pollution removal, resource recovery and bioenergy generation. **Technology interfaces** – applying concepts of techno-economic and sustainability assessment to evaluate and manage changes affecting society and the environment.



POLLUTANTS & MEDIA

Much of EBNet's activity has focused on this theme, from work on novel detection and measurement systems by the ESWS WG to investigation of the most recalcitrant compounds like PFAS. Outcomes have ranged from scientific papers and reports to position statements and responses to major national surveys. For a recent output from this theme listen to our podcast with the British Society of Soil Science on ['Key Innovations and Challenges in Soil Remediation for a Sustainable Future'](#)..

MICROBIOLOGY/ENGINEERING

Interactions between complex microbial systems and their engineering envelope are one of the driving forces behind Environmental Biotechnology. Three workshops focused on the impact of microenvironments, modelling of complex fluid systems like biological sludges, and systems with gaseous feedstocks. A competition for ideas to illustrate the importance of these interactions produced short [animations](#) on microbiology in wastewater treatment, aeration, aerobic granules, anaerobic fermentation, and slow sand filters.

TECHNOLOGY INTERFACES

This theme covered activities from human behaviour to concepts of process integration, optimisation and life cycle sustainability assessment. Highlights include the outputs of the PISA and EBSS WGs, and a range of training and expert workshops run for EBNet members and in conjunction with other NIBBs. In a nutshell, we believe that whole systems thinking is vital to the transition to a sustainable circular economy.



Events

It's hard to remember when webinars weren't a thing, but we only started them back in 2020 as a stopgap measure! EBNet has since run **over 30** of these, with single or multiple invited speakers from across the UK and around the world. Our thanks to everyone who has contributed to sharing their knowledge freely amongst the wider Environmental Biotechnology community. Wherever possible, recordings are made available online at our [YouTube channel](#).

But nothing beats meeting people face-to-face. We brought our community together with an array of top research at our inaugural Research Colloquium in Edinburgh, 22-23 January 2020. Thereafter we have held ECR and WG events plus numerous joint activities with our sister-NIBBs. And we have been a presence making contacts at numerous water and waste industry events e.g. ADBA, REA, AquaEnviro, the European FOG summit etc.

JOINT EVENTS WITH OTHER NIBBS

- **EBNet & Algae-UK:** Recent developments in the field of carbon capture, commercial development and integrated systems, 9 Oct 2019, London
- **E3B & EBNet:** Metal biorecovery and bioremediation, 28-29 Nov 2019, Manchester
- **Algae-UK, BBNet & EBNet:** Sargassum golden tides: a global problem, 26 May 2021, online
- **BBNet, HVB, EBNet & Supergen Bioenergy Hub:** Realising the potential of your ideas through partnership and funding, 10-11 October 2023, Sheffield
- **E3B & EBNet:** Bio-recovery of technology-relevant metals, 12-14 December 2023, Manchester
- **EBNet & Carbon Recycling Network:** Microbial systems with gaseous feedstocks, 27-28 March 2024, Cheshire.
- **BBNet, HVB, EBNet & Supergen Bioenergy Hub:** An introduction to life cycle assessment (LCA) methodology course, 26–27 November 2024, York
- **BBNet & EBNet:** The role of anaerobic fermentation in the circular bio-economy, 23-24 January 2025, Birmingham
- **BBNet & EBNet:** Integration of thermal and biological conversion technologies, 24 February 2025, London

EBNet has supported meetings and presentations at well **over 100 events** with groups including ADBA, the Chartered Institution of Wastes Management, Supergen Bioenergy, IEA Task 37, the Royal Agricultural Society of England and many other industry and professional organisations.

February 2014 also saw the launch of the [Environmental Biotechnology Innovation Centre \(EBIC\)](#) – a world-class interdisciplinary engineering biology research hub which will continue to extend and develop EBNet's activities for the next 5 years.

The Global Center for Sustainable Bioproducts (GCSB) is one of 6 Joint NSF/UKRI/Other-funded initiatives with a focus on advancing bioeconomy research to solve global challenges. It is led in the UK by [Prof Sadhukhan](#) at the University of Surrey.



Resources

Animations and presentations

For our presentations and animations, see the EBNet [YouTube](#) channel. And find the Escape Room game, 'Contamination Crisis', [here](#).

Articles and Newsletters

EBNet contributed [articles](#) for various target audiences in external organisations, especially via [AD & Bioresources News](#) and the [Water Industry Journal](#).. Our monthly Newsletters are also available and full of useful information

Books

Our FREE e-book anthology '**Microbes to the Rescue!**' can be downloaded [HERE](#). An audiobook is available [here](#).

Suitable for outreach and education activities, this anthology contains a selection of short stories entered into our [EBNet/Green Stories writing competition](#). The stories cover a wide range of topics in Environmental Biotechnology in an entertaining and accessible way. We encourage you to share and use the book which is offered under a CC licence for non-commercial use: remember to attribute the authors who kindly made their work available!

A new anthology, '**Stories from the Microbial World**', is available [here](#). The anthology presents 23 short stories selected from winning stories from the Green Stories competition 'Microbes to the Rescue' sponsored by EBNet, and the 'Clean vs Green' competition, which similarly uses fiction to tackle myths and misconceptions about bacteria. The goal was to raise awareness of the environmental and health implications of over-cleaning.

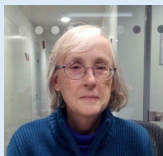
Reports and Position Statements

The EB community is multifaceted. Responding to various sector surveys is one way we help to ensure that the voice of the community is heard. In addition, we encouraged outputs from our many workshops, and supported impact in the form of reports, position statements and other communications. One major undertaking supported by EBNet was the Royal Agricultural Society of England (RASE) Report – [Farm of the Future: Journey to Net Zero](#). Other contributions include position statements and research priorities from our workshops on Gas Fermentation and our working groups on PFAS. You can find more details of these and many other outputs online at [Resources](#).

EBNet Team

EBNet has a Steering group and Management Board to guide priorities, shape strategy and review activities: it includes input from CL:AIRE, CIWM, Fiberight Ltd, Biogen Ltd, WSP, Severn Trent Water, Thames Water, NNFC. An International Advisory Group provides further expertise, advice and a pool of experienced referees.

The Executive Group carries out day-to-day management, and consists of:



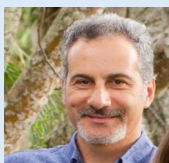
Principal Investigator /Director [Prof Sonia Heaven](#), University of Southampton, Faculty of Engineering and the Environment



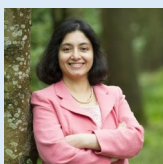
Co-Investigator [Prof Frederic Coulon](#), Cranfield University, School of Water, Energy and Environment.
Prof Coulon is also PI of the [Environmental Biotechnology Innovation Centre](#)



Co-Investigator [Prof Tom Curtis](#), Newcastle University, School of Engineering



Co-Investigator [Prof Tony Gutierrez](#), Heriot-Watt University, School of Engineering and Physical Science



Co-Investigator [Prof Jhuma Sadhukhan](#), University of Surrey, Centre for Environmental Strategy



Network Manager Dr Louise Byfield, University of Southampton



Network Manager Angie Bywater, University of Southampton



www.ebnet.ac.uk

ebnet@ebnet.ac.uk

Building 178 Boldrewood Campus
University of Southampton SO16 7QF

Cite as: EBNet, 2025. ECR WG and ECR Events Report.
Environmental Biotechnology Network.
<https://ebnet.ac.uk/resources/>.

