



Aquaculture:
Fish Health
and
Disease
18 – 19 March 2014





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INFORMATION FOR DELEGATES

Registration

Elsa Quinn looks forward to welcoming you at Registration in the Library Foyer area of the meeting room suites. She will be on hand throughout the day to assist with any administrative queries.

Main meeting room

The main meeting will be held in the Oxford – Cambridge Suite, situated on the ground floor. There are two breakout rooms which are the Sunningdale and the Ascot Rooms. Refreshments and lunch will be served in the London Room.



BBSRC

The Biotechnology and Biological Sciences Research Council (BBSRC) is the UK's leading funder of academic research and training in the non-clinical life sciences in universities, institutes and centres.

We fund internationally competitive research to improve the fundamental understanding of the biological systems upon which all human life depends. Our research spans the microbial, plant and animal kingdoms, from molecules to whole organisms and populations.

Excellent bioscience underpins and drives advances in medicine and health, 'green materials' new pharmaceuticals, and safe nutritious food; it leads to more sustainable agriculture, helps to combat infectious diseases and underpins responses to climate change.

In the coming decades our research will be at the heart of providing solutions to major challenges facing humankind such as:

- Feeding nine billion people sustainably by 2050
- Developing renewable 'low carbon' sources of energy, transport fuels and chemicals to reduce dependence on fossil fuels
- Staying healthier for longer as lifespans increase and society ages

We also provide training in the biosciences, drive knowledge exchange and innovation, and enable public engagement around issues and societal importance.

Contact: Merewyn Loder

Email: merewyn.loder@bbsrc.ac.uk

Website: www.bbsrc.ac.uk



NERC

The Natural Environment Research Council (NERC) is the largest funder of environmental science in the UK. We invest £300 million each year in research, training and innovation through UK universities and research centres. Our scientists study and monitor the whole planet, from pole to pole, and from the deep Earth and oceans to the upper atmosphere and space. We address and respond to critical issues such as environmental hazards, resource security and environmental change. Through collaboration with scientific partners, business and policy-makers, our science supports sustainable economic growth and improves public wellbeing – reducing risks to health, infrastructure, supply chains and our changing environment.

Contact: Murray Gardner

Email: murd@nerc.ac.uk

Website: www.nerc.ac.uk

Background

BBSRC and NERC have recognised the need to build capacity in basic research on fish health and disease. Aquaculture is a rapidly growing area component of global food supplies and an improved understanding of the basic biology and health of farmed fish and shellfish is needed to support the continued development of sustainable production. Multidisciplinary expertise from a diverse range of scientific areas may provide insight into some of the problems. This workshop aims to bring together those working on the health of farmed fish with experts in basic fish biology, animal health, epidemiology, immunology, genetics, novel tools and technologies, industry representatives and a range of other disciplines to prioritise research needs in the area in order to inform future activities and develop new collaborations.

Aims:

The workshop will **aim** to:

- Prioritise the research gaps in fish and shellfish health and disease, including environmental interactions.
- Promote collaboration between the BBSRC, NERC and other relevant research communities
- Provide a focus for discussion on novel technologies/technology development
- Facilitate new multidisciplinary research partnerships that could lead to collaborative bids for funding
- Encourage the development of a strong UK wide research community

AGENDA

Day 1 – 18 th March 2014		
Research gaps and priorities – Chaired by Professor Randolph Richards		
Time	Programme	Speaker
10:00 – 11:00	Registration and Tea and Coffee	
11:00 – 11:05	Welcome and BBSRC Aquaculture strategy	Paul Burrows – BBSRC Director
11:05 – 11:20	Fish Health Research gaps – Consultation	Dr Merewyn Loder – BBSRC Programme Manager
11:20 – 11:40	Aims of the workshop	Chair Prof Randolph Richards – University of Stirling
11:40 – 12:00	Aquaculture research in the UK placing basic science in context of current activities	Prof Patrick Smith – Tethys Aquaculture
12:00 – 13:00	Short presentations from selected attendees	
13:00 – 13:45	Lunch with Tea and Coffee	
13:45 – 16:30	Breakout groups Aims: Identifying and prioritizing research gaps including: <ul style="list-style-type: none"> • Ways to address the issues • Technology and expertise needs 	
16:30 – 17:00	Tea and Coffee	
17:00 – 17:45	Report back from the groups	
17:45 – 18:15	Group discussion of prioritisation	
18:15 – 19:30	Networking Drinks	
19:30	Dinner	

Day 2 – 19 March 2014		
Multidisciplinary Working		
Time	Programme	Speaker
09:00 – 09:45	Research Council funding – ‘hints and tips’ and funding schemes including training and international;	Dr Merewyn Loder
	What does a committee look for in a proposal?	Dr Tracey Coffey – University of Nottingham and BBSRC committee A
09:45 – 10:30	Scene setting talks – Multidisciplinary and multinational research examples and available technologies	Dr Iain Young – University of Liverpool, Prof Peter van West – University of Aberdeen Dr Herve Migaud – University of Sterling
10:30 – 12:30	Breakout groups including Tea and Coffee Aims: Consideration of mechanisms to address priorities/gaps identified on day 1	
12:30 – 13:00	Report back from Groups	
13:00 – 14:00	Lunch	
14:00 – 16:00	Breakout groups including Tea and Coffee Aims: Opportunity for groups to network to consider specific research opportunities and proposals Concurrent BBSRC and other funders ‘grants and funding’ surgery	
16:00	Close and thanks	Lesley Heppell BBSRC – Head of Animal Health and Welfare sector

LIST OF DELEGATES

NAME	ORGANISATION	EMAIL	EXPERTISE
Alexandra (Sandra) Adams	University of Stirling	alexandra.adams@stir.ac.uk	Fish vaccinology, fish diagnostics, host pathogen interactions
Karen Alexander	Scottish Association for Marine Science (SAMS)	Karen.Alexander@sams.ac.uk	NERC/BBSRC KE Fellow in Sustainable Aquaculture
Neil Auchterlonie	Cefas	neil.auchterlonie@cefas.co.uk	Aquaculture; science management
Mick Bailey	University of Bristol	Mick.bailey@bristol.ac.uk	Mucosal immunology, evolution of immune systems.
Iain Barber	University of Leicester	ib50@le.ac.uk	Host-parasite-environment interactions in fish Effects of parasites on fish behaviour, ecology and evolution Reproductive development and behaviour in fish Stickleback parasitology, behaviour, ecology and evolution
David Bass	University of Oxford	david.bass@zoo.ox.ac.uk	1) Protist phylogeny and biodiversity; 2) Environmental DNA (and RNA) sequencing (eDNA) approaches for assessing and discovering protist diversity and function, and community structure; 3) Taxonomy and systematics of protists.
Steve Bishop	The Roslin Institute, University of Edinburgh	Stephen.Bishop@roslin.ed.ac.uk	Genetics and health
Alan S. Bowman	University of Aberdeen	a.bowman@abdn.ac.uk	Ectoparasites, including sea lice, ticks, varroa mites and cat fleas
Adam Brooker	Institute of Aquaculture	Ajb3@stir.ac.uk	Fish parasitology, parasitic crustacean, monogeneans
Philip Brown	Aqualife Services Ltd	phil@aqualifeservices.co.uk	Fish Vaccination, Fish Welfare, Practical fish Farming
Jo Cable	Cardiff University	cablej@cardiff.ac.uk	Infectious diseases of fish and invasive species.
Yin Chen	University of Warwick	y.chen.25@warwick.ac.uk	Microbiology, functional metagenomics, biogeochemical cycles, trimethylamine (TMA) and trimethylamine oxide (TMAO) metabolism

Edward Codling	University of Essex	ecodling@essex.ac.uk	Mathematical modeling, theoretical ecology, movement analysis, behavior analysis, fisheries
Tracey Coffey	University of Nottingham	Tracey.coffey@nottingham.ac.uk	Molecular immunology, host:pathogen interaction, bovine immune response, bovine mastitis/tuberculosis, molecular typing, MLST development
Sonia Consuegra	Swansea University	s.consuegra@swansea.ac.uk	Fish genetics, Evolutionary Ecology
Jon Cooper	University of Glasgow	Jon.cooper@glasgow.ac.uk	Sensors, diagnostics, fluid dynamics, rheology
Simon Davies	Plymouth University (Editor-in-Chief of International Aquafeed)	sdavies@plymouth.ac.uk	Aquaculture Health and Nutrition/feed formulation of aquafeeds
Simeon Deguara	AquaBioTech Group	dsd@aquabt.com	Biosecurity, animal welfare, land-based and offshore aquaculture, recirculating aquaculture systems.
Andrew Desbois	University of Stirling	Ad54@stir.ac.uk	Microbiology; antimicrobial agents; alternative infection models; host-pathogen interactions
Marc S Dionne	King's College London	marc.dionne@kcl.ac.uk	Bacterial disease models, especially Mycobacterium marinum
Elisabeth Dyrinda	Heriot Watt University	e.a.dyrinda@hw.ac.uk	Shellfish immunology, in particular adult and juvenile bivalves. Immunotoxicology of marine shellfish
David Eckersall	University of Glasgow	David.eckersall@glasgow.ac.uk	Proteomics, biomarker discovery & validation, serum protein in diagnosis, acute phase protein
Sharon Egan	The University of Nottingham	sharon.egan@nottingham.ac.uk	Genomic analysis of host/pathogen interactions, vaccine development
Christophe Eizaguirre	Queen Mary, University of London	c.eizaguirre@qmul.ac.uk	Immunogenetics, host-parasite interactions, conservation biology
Lauren Ferrari	Marine Scotland Aquaculture Scottish Government	lauren.ferrari@scotland.gsi.gov.uk	Policy and legislation development and delivery. Salmonid aquaculture, shellfish aquaculture, non-native species. notifiable and emerging diseases – in particular Oyster Herpes Virus. Sea lice and the biological control of sea lice.
Clive Fox	Scottish Association for Marine Science	Clive.fox@sams.ac.uk	Jellyfish impacts on caged finfish culture
Naomi Fox	SRUC	naomi.fox@sruc.ac.uk	Disease ecology and epidemiological modelling

Darren Green	University of Stirling	darren.green@stir.ac.uk	Epidemiology, modelling, theoretical ecology.
Lauren Hall	University of Southampton	lsh203@soton.ac.uk	Host immune mechanisms in shellfish.
Alastair Hamilton	Landcatch Natural Selection	Alastair.Hamilton@Hendrix-Genetics.com	Fish and shellfish genetics, fish pathology, microbiology, molecular diagnostics Genetics of resistance / susceptibility of Atlantic salmon to IPN, sea lice, AGD, PD
David Hoole	Keele University	d.hoole@keele.ac.uk	Fish Immunity and Disease
Ross Houston	The Roslin Institute, University of Edinburgh	Ross.houston@roslin.ed.ac.uk	Genomics of aquaculture species QTL mapping and marker-assisted selection in breeding programs Genetics of disease resistance Genotyping by sequencing
Adam Hurlstone	University of Manchester	Adam.hurlstone@manchester.ac.uk	Genetic modification/engineering of zebrafish. Production of transgenic animals including BAC transgenesis.
Christos Ioannou	University of Bristol	bzcci@bris.ac.uk	Social behavior, Fish behavior, Predator behaviour
Joseph Jackson	IBERS, Aberystwyth University	Jaj11@aber.ac.uk	Ecological immunology, immunoepidemiology, parasitology
Art R.T. Jonkers	University of Muenster, Germany (formerly University of Liverpool, UK)	jonkers@earth.uni-muenster.de	Statistics, complex systems, network simulation & analysis, modelling, parallel & high-throughput computing, programming
Angray Kang	Queen Mary University of London	a.s.kang@qmul.ac.uk	Recombinant antibody engineering, paratransgenesis http://aquaculturesolutionsinc.com/
Jim Kaufman	University of Cambridge	Jfk31@cam.ac.uk	An understanding of antigen presentation to T lymphocytes (essentially, how MHC molecules work in fish) and T cell epitope identification
Rachel A. Lawrence	Royal Veterinary College	rlawrence@rvc.ac.uk	Immunology, Infectious Disease, Microbiome
George Lomonosoff	John Innes Centre	George.lomonosoff@jic.ac.uk	Plant-based expression systems
Ingrid Lupatsch	Swansea University	i.lupatsch@swansea.ac.uk	Aquaculture of fish and shrimps, nutritional requirements, bioenergetics, feed ingredient evaluation, formulating well balanced feeds designed for optimal growth, health and product quality
Andrew MacColl	University of Nottingham	andrew.maccoll@nottingham.ac.uk	Host-parasite interactions and disease resistance in wild fish, especially their

			ecological and evolutionary significance.
Shelagh Malham	Bangor University	s.malham@bangor.ac.uk	Environmental effects on Shellfish. Shellfish immunology. Sustainable shellfish and climate change. Shellfish and human pathogens. Food Security and Water quality are key drivers of my work
John Marshall	Fish Vet Group Ltd	john.marshall@fishvetgroup.com	Medicine and Vaccine Development, Sales and Marketing
Samuel A M Martin	University of Aberdeen	Sam.martin@abdn.ac.uk	Fish health and nutrition in aquaculture. Interactions between health and physiological performance. Genomics / transcriptomics
Brendan McAndrew	University of Stirling	Bjm1@stir.ac.uk	Genetics and Genomics of farmed aquatic organisms
Imelda McGonnell	Royal Veterinary College	imcgonnell@rvc.ac.uk	Zebrafish as a model of disease.
Herve Migaud	University of Stirling	herve.migaud@stir.ac.uk	
Kenton Lloyd Morgan	University of Liverpool	k.l.morgan@liv.ac.uk	Aquatic Epidemiology; Chair of International Society of Aquatic Animal Epidemiology ISAAE 2006-12; Chaired review of Scottish Sea Lice Research
Julia Mullins	Skretting ARC (Aquaculture Research Centre)	Julia.mullins@skretting.com	Use of diet to mitigate the impacts of various pathogens upon fish health. For example in Amoebic gill disease, sea lice infestation, HSMI etc. The effects of hydrogen peroxide on fish skin and gills. Sea lice medicines. I have worked as an aquaculture veterinarian on both coasts of Canada.
Arjan Narbad	IFR (Institute of Food Research)	arjan.narbad@ifr.ac.uk	Gut microbiology
Arun Ninawe	DBT, Delhi		Aquaculture & Marine Biotechnology
Beth Okamura	Natural History Museum	b.okamura@nhm.ac.uk	1) Parasite life cycles, invertebrate hosts, ecology and risk of salmonid disease (proliferative kidney disease), implications for wild and farmed fish health. 2) eDNA approaches for assessing microbial endoparasites and disease risk, especially in shellfish (molluscs and crustaceans).
Giuseppe Paladini	University of Stirling	gp14@stir.ac.uk	Aquatic Parasitology

Richard Paley	Centre for Environment Fisheries and Aquaculture Science (Cefas)	richard.paley@cefas.co.uk	Fish and Shellfish Health and Disease: Virology; molecular biology; cell culture; in vitro culture of pathogens and bio-assays; in vivo disease challenge development; diagnostics; oomycete, mesomycetozoon and amoebae culture.
Lloyd Samuel Peck	British Antarctic Survey	l.peck@bas.ac.uk	Marine ecology/physiology, especially polar
Devika Pillai	Kerala University of Fisheries and Ocean Studies, Kochi	devikamanoj.pillai@gmail.com	Fish health (Molecular diagnosis and Stress management in aquaculture)
K V Rajendran	Central Institute of Fisheries Education, Mumbai	kvrajendran@cife.edu.in	Crustacean Viral Diseases and Molecular Diagnostics. Crustacean immune genes and understanding shrimp innate immune response by RNA interference. Myxozoan parasites of fish. Toll-like receptors in aquatic animals
Mark Rawling	University of Plymouth	Mark.rawling@plymouth.ac.uk	Fish Nutrition, Immunology, Hematology, Transcriptomics
Rob Raynard	Marine Scotland Science	Rob.Raynard@scotland.gov.uk	Fish and shellfish disease diagnostics, epidemiology, notifiable and emerging diseases. Sea lice and amoebic gill disease. Salmonid aquaculture.
Randolph Richards	University of Stirling	rhr2@stir.ac.uk	Fish disease diagnosis, prevention and epidemiology
Hamish Rodger	Vet-Aqua International	hamishrodger@eircom.net	Aquatic animal (fish & shellfish) veterinary medicine
Ana Rodiles Guerrero	University of Plymouth	Ana.rodiles@plymouth.ac.uk	Genetics: DGGE, Next Generation Sequencing in 16S rRNA. Stress and digestive physiology in fish.
Jeanette Rotchell	University of Hull	J.Rotchell@hull.ac.uk	Aquatic Toxicology
Pramoda Kumar Sahoo	Central Institute of Freshwater Aquaculture	pksahoo1@hotmail.com	Nineteen years of research experience in fish disease diagnosis and health management through application of immunological, pathological and molecular tools
Swati Saxena	RCUK India	Swati.Saxena@fco.gov.uk	Deputy Director RCUK India
Kieran Sharkey	University of Liverpool	kjs@liv.ac.uk	Mathematical Modelling
Holly Shiels	University of Manchester	Holly.shiels@manchester.ac.uk	Fish cardiology and swimming kinematics and respirometry
Nathalie Simard	FishVet Group	Nathalie.simard@fishvetgroup.com	Vaccines (primarily biotechnology derived)

Richard John Slaski	Scottish Aquaculture Research Forum	r.slaski@sarf.org.uk	Commissioning aquaculture research
Valerie J Smith	University of St Andrews	vjs1@st-andrews.ac.uk	Shellfish immunology and pathology. Fish immunology and related areas pertinent to disease control in aquaculture.
Patrick Smith	Tethys Aquaculture Ltd	patrick.tethysaquaculture@gmail.com	Fish health/Fish pathology in general, fish vaccines/fish immunology in particular
Adam Stevens	University of Manchester	Adam.stevens@manchester.ac.uk	Genomics of growth and metabolism, gene: environment interaction, Developmental systems biology.
David Stone	Cefas	david.stone@cefas.co.uk	Molecular virology / molecular biology
Kim Thompson	University of Stirling	kdt1@stir.ac.uk	fish immunology; diagnostics; vaccine development;
John Tinsley	BioMar Ltd	jtinsley@biomar.co.uk	Fish nutrition, raw materials, functional feed, immunology
Tardi Tjahjadi	University of Warwick	T.Tjahjadi@warwick.ac.uk	Image processing, pattern recognition and real-time computer vision.
Charles R. Tyler	University of Exeter	c.r.tyler@ex.ac.uk	Fish - Physiology, Reproduction and Ecotoxicology
Pieter van West	University of Aberdeen	p.vanwest@abdn.ac.uk	Oomycete plant and animal diseases (eukaryotic microbiology)
David Verner-Jeffreys	Cefas	David.verner-jeffreys@cefas.co.uk	I am an aquaculture health expert with particular expertise in bacterial diseases of fish and shellfish. I am also involved in the development and testing of therapeutants for the control of diseases of aquatic animals.
Robin Wardle	MSD Animal Health- Global Aquaculture Business	Robin.wardle@merck.com	Aquaculture pharmaceuticals
John Webster	Scottish Salmon Producers' Organisation	JWebster@scottishsalmon.co.uk	
Manfred Weidmann	Institute of Aquaculture	m.w.weidmann@stir.ac.uk	Virology, Molecular Diagnostics
Phillip Whitfield	University of the Highlands and the Islands	phil.whitfield@uhi.ac.uk	Proteomic and lipidomic analysis of fish and fish feed.
John Whittall	Sustainable Agriculture and Food Technology Strategy Board	John.whittall@tsb.gov.uk	
Kezia Williamson	Biosciences KTN	Kezia.williamson@biosciencektn.com	Funding and industry needs in the UK and beyond

Iain Young	University of Liverpool	isyoun@liv.ac.uk	Aquaculture, Fish biology, Fish physiology, Proteomic approaches to fish biology, Added value production, sustainable approaches
Ruth N. Zadoks	University of Glasgow	Ruth.zadoks@glasgow.ac.uk	Molecular epidemiology, infectious diseases

BREAKOUT GROUP 1



David Bass

Yin Chen

Lauren Hall

Art R.T. Jonkers

Arjan Narbad

Richard Paley

Rob Raynard

P K Sahoo

Phillip Whitfield



BREAKOUT GROUP 2



Alastair Hamilton

Angray Kang

Herve Migaud

Arun Ninawe

Beth Okamura

Lloyd Samuel Peck

Kim Thompson

Iain Young

BREAKOUT GROUP 3



Alexandra (Sandra) Adams

Karen Alexander

Sonia Consuegra

Sharon Egan

Shelagh Malham

Holly Sheils

Tardi Tjahjadi

Charles R. Tyler

Ruth N. Zadoks



BREAKOUT GROUP 4



Simeon Deguara

Elisabeth Dyrinda

Lauren Ferrari

Mark Rawling

Jeanette Rotchell

Patrick Smith

Adam Stevens

John Tinsley

BREAKOUT GROUP 5



Neil Auchterlonie

Alan S. Bowman

Jo Cable

Edward Codling

Joseph Jackson

Ingrid Lupatsch

John Marshall

K V Rajendran

Nathalie Simard



BREAKOUT GROUP 6



Iain Barber

Jon Cooper

Darren Green

Kenton Lloyd Morgan

Giuseppe Paladini

Devika Pillai

Valerie J Smith

Pieter van West

John Whittall

BREAKOUT GROUP 7



Mick Bailey

Steve Bishop

Jim Kauffman

Rachel A. Lawrence

George Lomonosoff

Randolph Richards

Ana Rodiles Guerrero

David Stone

Manfred Weidmann



BREAKOUT GROUP 8



Tracey Coffey

Andrew Desbois

David Hoole

Adam Hurlstone

Christos Ioannou

Julia Mullins

Kieran Sharkey

Richard John Slaski

Robin Wardle

BREAKOUT GROUP 9



Philip Brown

Simon Davies

Marc S Dionne

David Eckersall

Naomi Fox

Imelda McGonnell

Hamish Rodger

David Verner-Jeffreys



BREAKOUT GROUP 10



Adam Brooker

Christophe Eizaguirre

Clive Fox

Ross Houston

Andrew MacColl

Samuel A M Martin

Brendan McAndrew

John Webster

Kezia Williamson



A list of BBSRC Funding schemes

Responsive Mode

Open to applications across the BBSRC remit. This is our main funding mechanism with three application deadlines a year. January, April and September.

Initiatives

These are specific topic based schemes usually in an area of strategic interest. Some are joint with other funders either in the UK or abroad. Most will be one off calls but there are some which are annual or have several rounds. All open special initiatives can be found at <http://www.bbsrc.ac.uk/funding/opportunities/opportunities-index.aspx>. Closed initiatives (after the date for application has passed) are listed by year.

Annual Initiatives

Bioinformatics and Biological Resources Fund

To provide proper support for resources such as databases, genetic resources and culture collections which require long term maintenance and curation. **Launches around March**

Tools and Resources Development Fund- 1

To pump prime the next generation of tools, technologies and resources that will be required by bioscience researchers in scientific areas within our remit applications that develop novel tools, technologies and methods spanning the breadth of BBSRC research and underpin in the long-run all of our strategic priorities and the wider biosciences. **Launches June /July**

Tools and Resources Development Fund- 2

To encourage the development of novel software tools, technologies and computational methods for research challenges within our remit. **Launches June/July**

Current/ Upcoming Initiatives and clubs

ERA-Net Industrial Biotechnology

This is the fifth call within ERA-Net Industrial Biotechnology (ERA-IB) for multilateral research projects addressing "Industrial biotechnology for Europe: an integrated approach". BBSRC has allocated up to £4M to support this call. **Pre-proposal application deadline 31 March 2014**

ERA-Net Bioenergy

This is the eighth call within ERA-Net Bioenergy (ERA-Bioenergy) for research projects addressing Integrated Biorefining. BBSRC has allocated up to £3M to support this call. **Pre-proposals 28th April 2014**

Advanced Life Sciences Research Technology Initiative

For the purchase items of advanced research equipment and the development of capability in its creative use in order to maintain the competitiveness of the UK research base. The focus is on for multi-use, mid-range equipment acquisitions **Launch March 2014**

Diet and Health Research Industry Club (DRINC)

The club supports **high quality research into diet and health** within UK universities and research institutes that **underpins the needs of the food industry**. **The next round will launch spring 2014**

Agri-tech catalyst

The Agri-Tech Catalyst has been set up by the Technology Strategy Board and BBSRC with £70M investment to help make the UK a world leader in agricultural technology, innovation and sustainability. The Department for International Development is contributing £10M to the Catalyst, to support the transfer of technology and new products to developing countries. **Registration deadline June 4th 2014**

IB catalyst

Together with the Engineering and Physical Sciences Research Council (EPSRC) and the Technology Strategy Board (TSB) we are committed to supporting the development and commercialisation of innovative Industrial Biotechnology (IB) processes. **Round 1 registration deadline: 7 May 2014 Round 2 call opens: 15 May 2014**

International

The following International schemes are open to BBSRC funded researchers (BBSRC research or initiative grant holders; project leaders at institutes that receive strategic funding from BBSRC; recipients of fellowship awards from BBSRC or from RCUK).

BBSRC International Scientific Interchange Scheme (ISIS)

Funding of up to £5,000 is available for travel and subsistence costs to visit scientists in any country. The scheme is open to applications all year round and applicants are to apply at least 6 weeks before travel.

BBSRC International Partnering Awards

BBSRC publishes annual calls for proposals to foster development of long-term partnerships with scientists in Europe, Brazil, Japan, China, India, Taiwan, United States and other countries. Funding of up to £50,000 for up to 4 years is available to support the following collaborative activities:

- Travel for one or more investigators in either direction
- Visits/access to facilities
- Scoping studies
- Workshops and networking
- Researcher exchanges
- Other collaborative activities

BBSRC International Workshops

Annual call for proposals to hold workshops with any other country to stimulate joint working in BBSRC's strategic priority areas. Funding of up to £10,000 is available and these Workshops can be held in the UK or overseas.

FAPESP Pump-Priming Awards (FAPPA)

Funding is available to leading funded research groups to pump-prime interactions with top FAPESP scientists in Brazil. This award is run jointly with Brazil's Sao Paulo Research Foundation (FAPESP). Funding of up to £35,000 over 2 years available for the UK partners and FAPESP will provide a similar funding to Brazilian scientists.

The scheme is open to applications all year round and applicants are to apply at least 12 weeks in advance.

Joint funding of research with overseas agencies:

BBSRC-Brazil (FAPESP) joint funding of research

Collaborative research proposals may be submitted in any area of science that is within the remit of both BBSRC and FAPESP. Proposals approved for funding will be jointly supported by BBSRC and FAPESP.

Deadlines are the same as for standard responsive mode proposals.

UK BBSRC-US NSF/BIO Lead Agency Pilot Opportunity

Pilot to allow US and UK researchers to submit a collaborative proposal in the following areas of intersection between NSF/BIO and BBSRC:

- **BBSRC Strategic Research Priorities, Responsive Mode**
 - Data Driven Bioscience
 - Systems Approaches to the Biosciences
 - Synthetic Biology (September 2015 submissions only)
- **NSF/BIO Solicitations**
 - Division of Molecular and Cellular Biosciences Solicitation NSF 13-510
 - Division of Biological Infrastructure Solicitation NSF 12-567

The intersection areas include systems biology, computational biology, bioinformatics and synthetic biology (Autumn 2015 only).

This pilot will operate for Autumn 2014 and Autumn 2015 responsive mode rounds. Proposals approved for funding will be supported by BBSRC and NSF/BIO.

Academic – Industry Collaborative Research:

Industrial Partnership awards (IPAs)



Science-led, responsive mode grants where an industrial partner contributes in cash at least 10% of the full economic cost of the project. In-kind contributions from industry are welcome but do not count against the industry contribution or the total cost of the project. Applications assessed by BBSRC's Research Committees, alongside standard applications, using the same criteria. IPA projects are normally funded in preference to standard grants of equivalent scientific merit due to the significant user interest.

BBSRC stand-alone LINK

Collaborative research with at least one company and one science-base partner where at least 50% of the full economic cost (FEC) of the project comes from industry. Applications should be for pre-competitive research that would not be undertaken without LINK support. Applications assessed by BBSRC's Research Committees, alongside standard applications, using the same criteria. LINK projects are normally funded in preference to standard grants of equivalent scientific merit due to the significant user interest.

Technology Strategy Board (TSB)

BBSRC provides co-funding for the Technology Strategy Board collaborative research programmes to support the costs of academics carrying out BBSRC relevant research. Applications are made through the TSB and must be business-led and collaborative.

Research and Technology Clubs (RTC)



RTCs fund high quality, innovative research in areas identified as strategically important by BBSRC and industry. Supported jointly by BBSRC, other funding bodies and consortia of companies, they operate by establishing funding pots to support academic research and encourage closer links between academia and industry. Clubs: [Bioprocessing Research Industry Club \(BRIC\)](#); [Diet and Health Research Industry Club \(DRINC\)](#); [Integrated Biorefining Research and Technology Club \(IBTI Club\)](#); [Crop Improvement Research Club \(CIRC\)](#); [Animal Health Research Club \(ARC\)](#).

Collaborative programmes of research

Collaborative funding activities to address strategically important areas of research, including: [Tackling Campylobacter in the food chain](#); [Chemical biology networks](#); [Integrative mammalian biology](#); [Horticulture and potato initiative](#).

People and information exchange:

Knowledge Transfer Networks (KTNs)

UK-wide networks designed to stimulate innovation in key technology sectors by promoting collaboration, best practice and knowledge sharing between industry and academia. KTNs are funded by the Technology Strategy Board. BBSRC is involved with 2 KTNs that encourage partnerships in strategically important areas of bioscience: HealthTech and Medicines KTN; Biosciences KTN.

Knowledge Transfer Partnerships (KTP):



KTPs are a UK-wide mechanism to transfer knowledge and to develop graduate and postgraduate personnel for industrial careers. A KTP lasts between 1 and 3 years and employs 1 or more high-calibre KTP Associates to work on an innovative project within industry. Associates are jointly supervised by the participating industrial and academic partners. Support is delivered through a grant to the academic partner. In addition, a contribution from the participating company fully covers an HEI's cost of participation. Apply at: <http://www.ktponline.org.uk/>

Industry Fellowships Scheme:

To promote longer-term knowledge exchange by supporting the exchange of mid-career researchers from the science base to industry or vice versa. Administered by the Royal Society and co-sponsored by BBSRC, EPSRC, NERC and Rolls-Royce plc, they can run for 2 years full time, or up to 4 years part-time. Fellows maintain a working relationship with, and remain employed by, their home institution, with salary costs covered by the fellowship. Research expenses (up to £2000/y) may be claimed. Applications invited twice a year by the Royal Society (<http://royalsociety.org/grants/>).

Flexible Interchange Programme (FLIP):



Supports the movement of people from one environment to a different one to exchange knowledge/technology/skills, developing bioscience research/researchers and addressing our strategic priorities. They provide flexible opportunities for individuals moving between different organisations, disciplines and sectors at all career stages beyond PhD (or equivalent). Awards typically last up to 24mths; cost up to £150k at 80% FEC; undertaken on full, part or intermittent basis; cover a contribution to the salary of the interchangers, reasonable travel and subsistence and costs associated with the interchange. Applications assessed by Research Committee E.

The **Industrial Impact Fellowships Programme** and **Industry Interchange Programme** are now incorporated into FLIP.

BBSRC/NERC Policy Internships (previously known as Policy Placements):

A 3-month internship opportunity for BBSRC and NERC - funded PhD students to gain experience of working in science policy at one of eight host science policy organisations (Parliamentary and Non-parliamentary). Assessment is via a two-stage process: written application and interview. From 2013, this scheme is run collaboratively with NERC.

Professional Internships for PhD Students (PIPS):

A key component of the BBSRC Doctoral Training Partnership (DTP) programme is PIPS - a three month integrated placement that aims to provide DTP students with the opportunity to carry out a work placement unrelated to their doctoral research during their PhD. Such experience is important to help early career researchers understand the context of their research and to expose them to the range of opportunities in which they can apply their PhD skills and training after they graduate. PIPS will provide students with experiences in a wide range of workplaces, including policy, media, teaching and industry.

Collaborative training:

Industrial CASE studentships:



To provide PhD students with a first-rate research training experience within a mutually beneficial research collaboration between academic and partner organisations. Studentships principally based at the academic partner, with a mandatory placement at the non-academic partner for a minimum of 3 months and up to 18 months. Student placement expenses must be met by the non-academic partner. Applications made by the academic partner through JeS; 90 4-year studentships available; deadline July.

Industrial CASE partnerships (ICP):



The ICP competition awards to industry a block allocation of four-year studentships covering several years' intake. The competition is for a multi-year allocation made to strategic industrial partners having established track records in collaborative doctoral training with BBSRC. It is one of the main ways in which BBSRC funds collaborative training and enables companies to better integrate industrial CASE studentships into their planning. Only companies or non-academic partners who have been invited by the BBSRC may enter the competition.

Modular Training Partnerships (MTP) (previously known as Modular Training for Industry, MTI):



MTPs fund the development of industrially-relevant short training courses at Masters level. **Collaboration with industry and evidence of industrial demand is a key requirement** for funding. Awards provide pump priming for the development of individual training modules; preparation and marketing of course materials; and course launch. There are three application deadlines per year and proposals are considered at the next available Committee E meeting.

Advancing Training Partnerships (ATP):



ATPs offer **postgraduate level training** to employees working in **UK agri-food industries**. **Four partnerships worth approximately £13M have been funded (from 2011 to 2016) and will begin to deliver courses to staff from a range of companies from 2012.** Each partnership operates under the leadership of an academic institution and focuses on a particular research area, covering the full range of food production from farm to fork.

Knowledge exchange, commercialisation and development:

Knowledge exchange and commercialisation seminars:



Funding and support to help deliver events to discuss, improve awareness and enable the sharing of best practice as to how knowledge exchange and commercialisation (KEC) can deliver benefits to the economy and society from the excellent research and capabilities funded by BBSRC. Up to £2,000 in grants towards costs of external speakers, room booking, time spent in organising the event and other reasonable costs. Open to institutes strategically funded by BBSRC and HEIs.

Biotechnology YES (Young Entrepreneurs Scheme):



A competition for postgraduate and postdoctoral scientists which raises awareness of the commercialisation of ideas from the biosciences. The competition is free to enter; travel, accommodation and meals provided; £5k prize fund; apply via Biotechnology YES website.

Enterprise Fellowships:



Funded by BBSRC and delivered by the Royal Society of Edinburgh, they are designed to encourage the development of a new business, building on previously funded BBSRC research, around a technological idea developed by the Fellow and within which the Fellow would be expected to play a leading role. Particularly relevant to individuals and ideas that previously received Follow-on Funding, they provide: a year's salary to develop a full business plan and seek investment; access to mentors, business experts and professional advisors; business training to develop the required skills. Apply to: Royal Society of Edinburgh (http://www.royalsoced.org.uk/180_FundingAwards.html).

Follow-on Funding (FOF):



Designed to support the translation of fundamental research funded by BBSRC into practical application, including commercialisation. It is a proof-of-concept model where further work on an idea will take it through to the stage at which the route to application is clear, which may include a spin-out or licensing. It enables activities essential to preparing a robust business plan and secure, where appropriate, further funding and support to progress. There are 3 types: **Pathfinder Follow-on fund**, to carry out preliminary commercial activities - projects up to 6 months, under £20k; **Standard**

Follow-on fund (FOF) – projects up to 12 months, valued at under £250k; **Super Follow-on fund** – projects between 12-24 months, valued £0.25M to £2M (applications by invitation after an outline phase). Apply to: ‘BBSRC Follow-on Fund’ through Je-S (<https://je-s.rcuk.ac.uk/JeS2WebLoginSite/Login.aspx>).

NOTE:

[Information for companies participating in collaborative research and training programmes:](#)

The company partner should be registered in the UK or have a UK R&D or manufacturing site. Where a suitable company cannot be found in the UK, an overseas company may be used. However, such collaborations are judged on a case by case basis, and clear justification must be provided. We strongly encourage applicants to contact us prior to submission if they wish to have an overseas company as an industrial partner.

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