Research in Life Sciences Directory 2025

UKRI BBSRC EastBio Partnership

Biotechnology and Biological Sciences Research Council

eastBIO
East of Scotland Bioscience Doctoral Training Partnership

Introduction

Since its first inception, in 2012, the UKRI BBSRC-funded EastBio partnership has been delivering excellence in bioscience research provision via a comprehensive and forward-thinking training programme. Through consecutive funding and support from BBSRV, EastBio has continued to evolve with a third award in 2020 and a fourth in 2024 through innovative collaboration across our current nine hosting partners -- the universities of Aberdeen, Dundee, Edinburgh, St Andrews, Stirling, SRUC, James Hutton Institute, Moredun Research Institute, IBioIC, as well as training partners SULSA, Cool Farm Alliance and new partners Scottish Policy and Research Exchange (SPRE) and In2ScienceUK. We embark upon a further 5 years of cohort-building and researcher development programme with five intakes of 38 co-funded students per annum. The EastBio programme continues to generate impacts in research and the broader society thanks to our collaborative governance approach that is based on co-creation, transparency, critical evaluation and input by students, supervisors, partner institutions and the funder.

In this context, the updated 2025 Research Directory features individual academic profiles contributed by our supervisors and collaborative partners; the brochure is aimed to serve as a dynamic resource for the use and benefit of both our supervisors, current or prospective, and industrial shareholders by facilitating efficient, creative and open networking and enabling the shaping of research connections and relationship across the partnership. The initiative was speared in 2023 by input from current supervisors and is corroborated by formal and anecdotal input on our programme from supervisors and students alike. We are committed to principles of excellent practice in research provision and support underpinned by our Equality, Diversity and Inclusion vision and we hope that this evolving resource will benefit especially early career researchers to establish networks of collaborators and allies and assist, alongside other forms of support provided by the partnership, in the removal of barriers to their professional development.

The EastBio Research Directory, first publicised in June 2024, is maintained as a digital resource published on the new EastBio website at https://biology.ed.ac.uk/eastbio/about-eastbio/collaboration-with-industry, where the 2024 Directory can be downloaded too. Each brochure provides a snapshot of the broad – transdisciplinary and collaborative - research conducted any given year across the partnership. Each profile features research keywords and a brief research and collaborative statement. We hope that you will find the resource helpful and enjoyable and you will reach out to these individuals attending an EastBio symposium or induction event!

EastBio team and the EastBio Management Group
Edinburgh, May 2025

Dr Paolo Annibale

University of St Andrews

technologies and methodological developments; health and wellbeing

I am a biophysicist with experience as a research microscopist, using scanning probe methods, then fluorescence fluctuations and super-resolution techniques. This expertise builds on top of training in solid-state physics, molecular electronics and semiconducting thin films matured working in Italy, Switzerland, the US, Germany and now the UK. Our team researches fundamental molecular mechanisms modulating cellular signalling using biophotonics and nanotechnology approaches.

We work in collaboration with pharmaceutical companies to screen fluorescent drug analogues.

https://www.researchgate.net/lab/Quantitative-Bioimaging-of-Cellular-Signaling-Paolo-Annibale-Paolo-Annibale

Dr Martin Balcerowicz

University of Dundee

plant temperature response; abiotic stress; gene expression; climate-ready crops

Ambient temperatures have profound effects on plant development and physiology, thereby strongly affecting crop quality and yield. As climate change emerges as a critical threat to global food security, these effects have garnered substantial attention from scientists, farmers, agricultural companies, policymakers, and politicians alike, yet our understanding of the underlying molecular processes remains limited. My lab studies the molecular mechanisms that plants employ to alter gene expression in response to high ambient temperature, using Arabidopsis thaliana and barley as our model systems. Ultimately, we hope to harness these mechanisms to enhance plants' resilience to a changing climate.

I would be interested in developing a project focusing on improving climate resilience in barley or Brassicaceae crops, e.g. by leveraging existing genetic variation or using gene editing to enhance thermotolerance.

https://sites.dundee.ac.uk/balcerowicz-lab/

Professor Scott L. Cockroft

University of Edinburgh CSE

technologies and methodological development; molecules, cells and industrial biotechnology

We are chemists working at the interface of biology through collaborations in the biological and medical sciences. We have interests in molecular recognition processes, molecular folding, lipid membranes, vesicles, transmembrane pores, membrane disruption, and protein/nucleic acid bioconjugation. We employ the tools of synthetic organic chemistry, patch clamp electrophysiology, fluorescence microscopy, and computational chemistry to tackle challenges related to understanding, disrupting, or exploiting biological interactions at a molecular level. Examples of these challenges include tackling antimicrobial resistance and the

chemical tagging of biomolecules to gain insight into biological function.

I have worked with Syngenta to understand the conformational properties of small molecules, and hence how this relates to their physiochemical properties and biological activity.

https://chem.ed.ac.uk/cockroft-group/research

Dr Rafael Guimaraes da Silva

University of St Andrews

enzymology, catalysis, antibiotics, biotechnology

Enzymes catalyse virtually all chemical reactions in living organisms, making their rates compatible with life. These proteins have evolved to utilize a range of strategies to achieve incredible rate enhancements in comparison with the corresponding non-catalysed reactions. The study of enzymatic mechanisms is fundamental to elucidate how enzymes work in physical and chemical terms, and how their activity is regulated. In the da Silva Lab, we apply techniques of molecular biology, biochemistry, structural biology and physical organic chemistry to unravel the mechanisms of enzymatic reactions catalysed by multi-protein allosteric complexes, tRNA methyltranferases, NADH-dependent oxidoreductases, and nucleotide hydrolases. Particular attention is given to transition-state structure, inhibitor design, and fast protein dynamics. We use the uncovered information to design inhibitors and biocatalytic routes.

I have been a consultant for companies in the USA and UK, and have active collaborations with drug companies in the UK (NuCana) and biocatalysis companies in India (Kcat Enzymatic).

https://dasilva.wp.st-andrews.ac.uk/

Professor Owen Davies

University of Edinburgh CSE

meiosis, cell division, recombination, protein self-assembly, structural biology

Meiotic cell division is defined by a unique and highly dynamic programme of events that results in homologous chromosome segregation following crossover formation. In mammals, the telomeric ends of chromosomes become tethered to the nuclear envelope by the meiotic telomere complex, where they undergo rapid movements, driven by microtubule forces transmitted by the LINC complex, that facilitate the identification and alignment of homologous chromosome pairs through recombination. Once established, homologue chromosome pairs become synapsed along their length by the zipper-like assembly of the synaptonemal complex, which provides the unique three-dimensional architecture necessary for recombination intermediate resolution and crossover formation. Our research aims to uncover the structure, assembly mechanism and recombination function of the synaptonemal complex, the mechanistic basis of nuclear envelope tethering by the meiotic telomere complex and the mechanism of force transduction by the LINC complex. To achieve this, we adopt a structural biology approach of biophysics, crystallography and cryo-EM, coupled with collaborative structure-directed mutation in mouse meiosis. Ultimately,

we aim to uncover how the mammalian synaptonemal complex, meiotic telomere complex and LINC complex operate together as an integrated molecular machine to achieve their essential functions of mammalian meiosis, and crucially how their dysfunction leads to human infertility, miscarriage and aneuploidy.

https://edwebprofiles.ed.ac.uk/profile/dr-owen-davies

Dr Andrew Desbois

University of Stirling

aquaculture; antimicrobial resistance; microbiology

My research concerns the microbiology of aquaculture systems with a key aim to characterise, prevent and control bacterial infections in aquatic animals. Antimicrobial resistance provides a special focus, including describing the scale of this problem to identifying and evaluating possible interventions. I apply a range of methods to address my research questions, from bacterial culture and molecular microbiology through to systems thinking and participatory approaches. Study host species range from temperate salmonids and marine shellfish to warmwater shrimp, tilapia and catfish, all cultured in diverse production systems from open ponds and pens through to sophisticated closed recirculation systems. I work regularly in collaboration with aquatic animal producers, vaccine manufacturers, and animal health product suppliers.

https://www.stir.ac.uk/people/256149

Dr Elaine Emmerson

University of Edinburgh CMVM

health and wellbeing; cells; technologies and methodological development

Therapeutic radiation is a life-saving treatment for those with head and neck cancer. However, tissues that lie in the radiation field also receive high doses of radiation, leading to cellular damage and irreversible organ dysfunction. The salivary glands are often inadvertently irradiated, leading to significant oral health problems, and difficulties in speaking, eating and sleeping, which together severely affect quality-of-life. Patients rely solely on short-term solutions which alleviate the symptoms, and while considerable effort has been invested in understanding the side effects of radiation injury on the SGs, there is no permanent cure for this debilitating condition. While the SGs go through an initial period of regeneration, this ultimately fails over time and the tissue degenerates. However, why this occurs and which cells are involved is unknown. Our research aims to characterise the cellular response to radiation injury, understand the kinetics of crucial ligand-cell interactions, and ultimately test whether regeneration can be rescued by replacing injured cells or restoring cell-niche crosstalk. A regenerative approach could eliminate the need for lifelong salivary replacements for people experiencing *xerostomia* (chronic dry mouth). This has the potential to save over £1 billion/year within the UK, and to lead to vast improvements in patient quality of life after cancer treatment.

https://edwebprofiles.ed.ac.uk/profile/elaine-emmerson

Dr William Farnaby

University of Dundee

technologies and methodological development, molecules, cells

Diseases of the Central Nervous System (CNS) affect millions of people globally. In the UK alone, neurodegenerative diseases will affect 2 million people by 2051 and have very limited effective treatments. We seek to discover a new generation of chemical tools to better understand and address CNS diseases.

Currently, molecules used to treat and understand CNS diseases typically act by binding to critical sites on target proteins to block or inhibit their function. In contrast, small molecules that can induce proximity of target proteins to other 'effector' proteins are able to regulate target proteins in many other ways beyond just inhibition. This concept has revolutionised drug discovery and chemical biology and offers new paradigms for understanding and treating disease.

We identify new induced proximity approaches such as molecular glues and bifunctional molecules, as well as developing new chemical genetics systems. This includes, but is not limited to, the use of high-throughput chemistry and allied cellular assays, novel electrophilic probes, chemoproteomics, biophysics and cellular mechanism of action studies in the most disease-relevant models possible. Our group is based within the University of Dundee Centre for Targeted Protein Degradation, a world-class research centre for multi-disciplinary translational chemical biology. We collaborate with experts in academia and industry to ensure our research and the approaches we discover can have maximal impact and meaning for the life science community. We use our creative freedom, curiosity and our passion for scientific discovery to generate new knowledge to benefit society.

The Farnaby group has developed a number of collaborations with industry and seeks to further develop those opportunities to help translate our science and make the tools we develop as widely available as possible for the research community. Current collaborations include projects with Tocris Biotechne and BioAscent with further collaborations due to start imminently. Dr Farnaby is also a co-PI on the Michael J Fox Foundation LITE consortia initiative.

https://sites.dundee.ac.uk/farnaby-group/

Professor Gregor Gorjanc

University of Edinburgh
CMVM

genetics, breeding, statistics, genomics, data science

We focus on populations used for food, feed and fibre production with some spillover into other populations. We are particularly interested in: (i) methods for genetics and breeding, (ii) design and optimisation of breeding programmes, and (iii) analysis of data to unravel biology and find new ways of improving populations

We have experience working with a range of academic and non-academic partners, including for profit and non-profit non-organisations.

https://vet.ed.ac.uk/roslin/research/divisions/quantitative-biology/highlander-lab

Adam Hayward

Moredun Research Institute

parasitology, livestock, immunity, parasite control, agriculture

Animals in any population, wild or domesticated, vary enormously in their responses to infection. Some mount effective immune responses that clear the infection (resistance), some appear to continue to thrive in spite of infection (tolerance), others deal poorly with the infection and succumb to its effects (susceptible). My interest is in asking how individuals vary in these traits, identifying the mechanisms underpinning this variation, and working out how we can exploit this variation to devise strategies to reduce the impact of disease on the productivity and sustainability of the livestock industry, including breeding and management of the environment.

My main focus is on helminth parasites of sheep (gastro-intestinal nematodes), and I collaborate with colleagues who are experts in immunology, parasitology and genetics, as well as producers and commercial companies with more knowledge of animal production. I mainly use data collected from large-scale field trials but also use data from abattoirs and I have worked on a wild population of Soay sheep for over 15 years. I also use meta-analysis to synthesise the results of past studies on important topics in livestock disease, summarise past findings and identify areas in need of research.

I developed a collaboration with a farm in Cornwall on resilience to nematode infection in sheep. Together we worked on an Innovate UK-funded project on tolerance of nematode infection and how it varied between individual lambs and breeding sires.

https://moredun.org.uk/people/staff-directory/adam-hayward

Dr Emilie Hollville

University of Aberdeen

neuronal morphogenesis, neurodegeneration, ubiquitin signalling, programmed cell death, membrane trafficking

Genetic risk factors encoding ubiquitin ligases are increasingly found associated with neurodevelopmental and neurodegenerative disorders. Their function in the brain is however not always fully understood. Our lab investigates how these ubiquitin ligases and their substrates cooperate to control the maturation and maintenance of neuronal architecture and structure which is systematically found affected in neurological diseases. We use complementary approaches, including biochemistry and proteomics, to identify and validate ubiquitin ligases/substrates pairs. We also employ fluorescent reporters and confocal imaging of mouse primary neurons and brain tissue to study the functional impact of the ubiquitin signalling pathways on neuronal architecture. Our goal is to identify critical ubiquitin signalling hubs controlling neuronal morphology and help identify future therapeutical targets.

https://www.abdn.ac.uk/people/emilie.hollville

Professor Louise Horsfall

University of Edinburgh
CSE

sustainable biotechnology; engineering biology; microbes

Metals have a finite supply, thus metal scarcity and supply security have become worldwide issues. We have to ensure that we do not drain important resources by prioritising the desires of the present over the needs of the future. To solve such a global challenge, we need to move to a circular, more sustainable economy where we use the resources we have more wisely. One of the founding principles of a circular economy is that waste is an unused feedstock, that organic and inorganic components can be engineered to fit within a materials cycle by the design, engineering and re-purposing of waste streams.

Certain bacteria have the ability to reduce metal cations and form precipitates of zero-valence, pure metals, as part of their survival mechanism to defend against toxic levels of metal cations. Using Synthetic Biology tools and techniques, alongside iterative design, build and test cycles, we aim to enhance, manipulate and standardise the bio-manufacture of these nanosize precipitates as high value products - ultimately producing engineered microbes with the ability to upcycle critical metal ions from waste streams into high value nanoparticles with a range of exciting applications.

To date, I have interacted with over a hundred companies interested in sustainable technologies. My past collaborative projects with industry have included companies from large multi-nationals through to local SMEs, from sectors that include pharma, industrial biotech, food & drink, personal care, waste and remediation.

https://horsfall.bio.ed.ac.uk

Professor Alison Hulme

University of Edinburgh
CSE

biomolecular imaging; Raman microscopy; chemical biology; protein labelling; health and wellbeing

Imagine being able to image a cell, purely on the basis of the vibrations of its different molecular components (proteins, lipids, etc.). Over the past ten years we have shown that you can do exactly that, with exquisite sub-cellular resolution and near video-rate acquisition speeds, by using coherent Raman microscopy. We can even visualise small molecules, such as drugs or metabolites within the cell, by using bioorthogonal vibrations to detect their presence. Thus, coherent Raman microscopy provides a label-free platform for quantifying small molecule uptake by cells and in tissue models, and for studying phenotypic responses to a range of stimuli. We collaborate with biologists and biomedical scientists to aid understanding of the basic rules of life and to underpin projects focussed on healthy (and diseased) ageing processes. Alongside this imaging work, the Hulme group also develops new tools to probe protein-protein interactions, from stapled peptides, PROTACs, DUBTACs and molecular glues, to the synthesis of bespoke time-resolved proximity labelling probes.

We have extensive experience of developing collaborative CASE

awards across the pharmaceutical industry (AZ, GSK, UCB, Eli Lilly), funded through UKRI and charities. We are happy to partner in areas of commercial interest, particularly where a project can have dual aspects (public, alongside more commercially-sensitive) to ensure freedom to publish.

https://edwebprofiles.ed.ac.uk/profile/alison-hulme

Professor Marcel Jaspars

University of Aberdeen

chemical ecology, marine biodiscovery, method developme, industrial biotechnology, drug discovery

Marcel Jaspars is professor of organic chemistry at the University of Aberdeen, researching the functions and applications of marine and extremophile natural products. Marcel is co-author of the textbook *Organic Structure Analysis* (OUP 2010). Marcel has authored over 250 research papers and reviews. He founded the Marine Biodiscovery Centre in 2010. His main expertise is in the discovery, characterisation, utilisation and biosynthesis of marine natural products. This forms the core of the marine biodiscovery pipeline, and Marcel has frequent contact with people operating at all stages of this pipeline, from the collection and identification of the organisms to their testing in whole animal models. Marcel has been active at national and international levels to develop the science, its applications/industrial uptake and associated policy involved in marine biodiscovery and biotechnology.

Marcel provided scientific leadership for a large EU FP7 consortium 'PharmaSea', running from 2012-2017 with the contributions of 24 partners from 14 countries. Part of this project was to engage with stakeholders, NGOs and policy makers to provide sound scientific advice on major issues affecting the conservation and sustainable use of marine biodiversity. His major role was to translate scientific information and provide options on this topic to senior policy makers at the EU and UN, making visits to Brussels and New York to present information in a digestible format and answer questions, paying particular attention to legal and policy requirements.

Marcel has worked with the pharmaceutical industry, agrochemical industry and policy makers in this area.

https://www.abdn.ac.uk/ncs/departments/chemistry/research/marine-biodiscovery/

and
https://www.abdn.ac.uk/people/m.jaspars

Dr Farina Khattak

SRUC

poultry nutrition, poultry production, gut health, Avian disease challenge models, meat meopathies and welfare

Farina Khattak earned her PhD from the University of Aberdeen, in 1997 and has since dedicated her career to advancing Poultry Science through research, teaching, and industry collaboration. Based at the Scottish Rural College (SRUC) in Edinburgh, she leads poultry nutrition research

and manages the state-of-the-art poultry research facility, in Allermuir.

Her research focuses on innovative nutritional strategies to enhance poultry health, performance, and sustainability. Key areas of interest include feedstuff evaluation, exogenous feed additives, nutritional interventions, and host-pathogen interactions. Her work aims to optimize poultry production, improve gut health, strengthen disease resistance, and enhance food safety.

Farina collaborates closely with national and international poultry industry partners, bridging academic research with industry needs to drive innovation and efficiency. As the holder of a UK Home Office ASPeL project license (Poultry Nutrition), she conducts regulated studies to evaluate novel feed additives and unregistered products, ensuring scientific rigor and compliance. Through her contributions, she plays a pivotal role in shaping sustainable and science-driven advancements in poultry nutrition and production.

Farina has extensive experience in developing and managing research projects in collaboration with non-academic partners, particularly within the poultry industry. Since 2009, she has led 86 different industry-funded projects, fostering strong partnerships with 15 national and 16 international companies, many of whom are repeat collaborators.

https://pure.sruc.ac.uk/en/persons/farina-khattak

Professor Marcus Lee

University of Dundee

Malaria; drug resistance; genome editing

We are interested in the molecular basis of drug resistance in the human malaria parasite *Plasmodium falciparum*, and in developing molecular genetics approaches to interrogate gene function.

One of our longstanding research interests has been to understand the mechanisms available to the parasite to develop resistance, which often comes at a cost in terms of fitness in the absence of drug pressure. We use in vitro evolution of resistance, genome sequencing and CRISPR-based engineering to understand drug mode-of-action and parasite adaption.

https://www.dundee.ac.uk/people/marcus-lee

Dr Craig Lewis (Genetic Services)

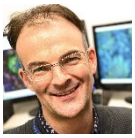
PIC Europe; University of Edinburgh/SRUC

genetics, welfare, behaviour

Making a better pig.

www.pic.com

Professor Neil A Mabbott



University of Edinburgh CMVM

immunology, host-pathogen interactions, bioimaging, infectious diseases, aging

My research aims to understand the interactions of infectious diseases within the immune system. Particular interests include understanding host-

pathogen interactions within the mucosal immune system, especially prion diseases and other gastrointestinal pathogens, such as Salmonella.

My research is also aimed at understanding how parasites such as African trypanosomes and nematodes manipulate the body's immune system to establish chronic infections. A systems biology approach is also being used to compare the transcriptomic profiles of distinct immune cell populations in the steady-state and during ageing.

https://edwebprofiles.ed.ac.uk/profile/neil-mabbott

Dr Tom MacGillivray

University of Edinburgh
CMVM

health and wellbeing; imaging and image analysis; clinical research; retina

I work in clinical research that features medical imaging and computational analysis. This includes the application of retinal imaging and analysis to conditions such as stroke, diabetes, MS, and Alzheimer's disease. My research group in the Centre for Clinical Brain Sciences at the University of Edinburgh sees PhD students and postdocs develop novel software methodologies for detecting and quantifying features in retinal imaging, as well as contributing to the standardization of acquisition and analysis protocols. My team at the Edinburgh Clinical Research Facility jointly with Edinburgh Imaging staff a computer laboratory and retinal imaging suite in the Queens Medical Research Institute and provide specialist support to investigators working with data from a variety of medical imaging modalities across the Little France BioQuarter campus.

I have previously collaborated with Optos and Heidelberg Engineering on PhD projects and Innovate UK KTPs.

https://edwebprofiles.ed.ac.uk/profile/dr-tom-macgillivray

Dr Stuart MacNeill

University of St Andrews

molecules, cells and industrial biotechnology; microbes, food and sustainability; bacteriophage; archaea

Research in the MacNeill lab is focused on using bacteriophage genome engineering to investigate the biology of lytic coliphage, primarily using bacteriophage T5 as a model. Current projects include attempting to understand the function of single-stranded DNA nicks found in packaged phage genomes, as well as the molecular mechanisms underlying phage-induced cell lysis. In addition, we are also studying selected carbohydrate-active enzymes (CAZymes) in haloarchaea with a focus on understanding fructan metabolism in these organisms. We use a variety of methods, including genetics, genome engineering, cell and molecular biology, biochemistry, structural biology and bioinformatics.

https://macneill.wp.st-andrews.ac.uk

Professor Peter Mccaffery

University of Aberdeen

communication and signalling, receptors, biomedical neuroscience, medical science and disease, biochemistry and physiology

Our research is focused on the function of the retinoic acid receptors (RARs) in the brain. The work initially explored the role of RARs to guide development of the CNS, demonstrating their capacity to regulate patterning of neurons in eye, spinal cord and brain. This work has extended to the adult CNS, developing the idea of RARs control of CNS development to their role in regulating neuronal plasticity. These studies point to the action of RARs to control adult neurogenesis in the hippocampus where they influence learning and memory and, also, how RARs control hypothalamic homeostatic functions and seasonal plasticity in the neural stem cells present in the hypothalamus. With collaborators at Durham University, we have demonstrated the neuroprotective actions of RARs in neuronal cell lines and cultured primary neurons and that the actions of the RAR ligands to promote both genomic and non-genomic activity is vital to this protective action. This collaboration has resulted in novel approaches to develop these ligands into therapeutics for neurodegenerative disease and led to the start-up company at Durham, Nevrargenics Ltd.

Our work on retinoic acid contributed to the founding of Nevrargenics Ltd., a UK drug discovery and development company focused on innovative and novel retinoids for neurodegenerative disease. The company is based in Durham with Professor Andy Whiting as CEO, who was the chemist who designed and synthesised new retinoic acid receptor agonists. I am on the scientific leadership team.

https://www.abdn.ac.uk/people/peter.mccaffery

Professor Alistair McCormick

University of Edinburgh CSE

plants, algae, cyanobacteria, engineering biology, biotechnology

Alistair McCormick studies photosynthesis in cyanobacteria, algae and plants using a cross-disciplinary, engineering biology approach. His lab focuses on developing fundamental understanding to progress applied research goals, including yield improvements in biomass, the production of high value products and/or carbon sequestration potential through rationally designed modifications of photosynthesis and primary metabolism. His lab is world-leading in efforts to engineering pyrenoid-based CO2-concentrating mechanism (pCCM) components into land plants to enhance photosynthetic efficiencies. Work to develop cyanobacteria as bio-platforms has been funded by the UKRI, the Scottish IBioIC, the CTRF, Innovate UK and supported by several UK industrial partners.

The McCormick lab's focus on engineering biology lends itself to collaborative research activities with academics and industrial partners, often working with labs from different disciplines. Their research work with industrial partner ScotBio led to an award for Best Innovative Collaboration at the Scotland's Life Sciences Awards in 2019. McCormick

currently serves on the Scientific Advisory Board for industrial partner CyanoCapture (since 2022), with which he collaborates on an Innovate UK award. He is also on the Scientific Advisory Board of the start-up Deep Blue Biotech, for which he provides consultation support.

http://mccormick.bio.ed.ac.uk

Dr Laura McCulloch

University of Edinburgh CMVM

health and wellbeing; neuroimmunology; stroke; ageing

Recent research has highlighted the increasing importance of cross-talk betwen the immune and central nervous systems in both homeostasis and disease. We investigate the impact of stroke on the systemic immune system and how this may contribute to complications of stroke recovery, including infection vulnerability, gastrointestinal dysfunction and cognitive decline. We hope to find new strategies for therapeutic intervention to improve recovery in patients. Additionally, we hope that understanding the fundamentals of these signals in the context of stroke will allow further investigation of the role of neuroimmune communication in homeostasis, stress and age.

We receive funding from the company Biotest, to investigate antibody replacement therapy in post-stroke infection.

https://inflammation-research.ed.ac.uk/research/research-groups/dr-laura-mcculloch

Professor Damian Mole

University of Edinburgh CMVM

inflammation, immunity, metabolism, drug discovery and development, translational clinical medicine, entrepreneurship

Damian is a surgeon, translational clinician scientist and recently-exited biotech founder. He leads scientific, clinical, corporate and academic teams to ask ambitious, exciting, and translationally important research questions, enabling discovery through first class science and critical investigation of disease mechanisms. His translational research programme incepted a prestigious GSK-University of Edinburgh DPAc Collaboration that was followed by the spin-out and licensing of Kynos Therapeutics Ltd from the University of Edinburgh, through venture capital equity and non-dilutive funding. Damian built the senior leadership and executive team and successfully navigated the company through preclinical and Phase 1 clinical trials, prior to acquisition by Dr Falk Pharma GmbH in October 2024. Jointly trained in the UK and USA in translational science and business leadership, and as a surgeon in liver and pancreas disease, Damian holds the 1777 Chair of Surgery at the University of Edinburgh and recently completed a MRC Senior Clinical Fellowship. Key strengths include leveraging deep experience of bridging academic, industry and pharma to deliver scientific innovations through a first-hand understanding of the critical path, and a clear line of sight to clinic to achieve maximum impact for patients.

GSK-University of Edinburgh DPAc Collaboration - PI; led the spin-out and licensing of Kynos Therapeutics Ltd from the University of Edinburgh, raising £12 million in equity and non-dilutive funding; built a senior leadership and executive team and successfully navigated the company through preclinical and Phase 1 clinical trials, prior to acquisition by Dr Falk Pharma GmbH in October 2024; Non-executive Director to Nami Surgical Ltd; provides clinical translational expertise to colleagues in Biomedical Engineering (Yunjie Yang, MRC Impact Accelerator Award), who have developed a smart E-Skin for high-performance 3D shape sensing in a soft robotic system

https://surgery.ed.ac.uk/staff/profiles/damian-mole

www.ed.ac.uk/surgery/damian-mole

Professor Matthew Nolan

University of Edinburgh
CMVM

animal systems, health and wellbeing, fundamental bioscience, neuroscience, neurotechnology

My research addresses four themes:

(a) Circuit organisation. We are investigating the local and long-range organisation of circuits in the entorhinal cortex. We want to understand how molecular level organisation within the entorhinal cortex leads to architectural principles that are critical for memory storage and retrieval.
(b) Circuit computations. We are using high density neural recordings and neural network models to investigate how entorhinal cortex circuits implement computations important for spatial memory.
(c) Technology development. With collaborators in the Institute for Integrated and Nano Systems, we are developing kilohertz frame rate cameras for imaging neural activity, and, with collaborators in the School of Informatics and the Centre for Statistics, we are developing new tools for analysing the organisation and activation of neural circuits.
(d) Circuit disorders. Many disorders of the brain appear to result from circuit level deficits. We believe that understanding the fundamental principles for neural circuit computation will be essential for understanding and treating disorders. We are addressing this by focusing on models of autism spectrum disorders and Alzheimer's disease.

We've previously collaborated with Biotech partners, Synpromics/Askbio. We're interested in similar future collaborations.

https://nolansurmelilab.github.io/

Dr Mattie Christine Pawlowic

University of Dundee

parasitology, Cryptosporidium, drug discovery, One Health

The Pawlowic lab studies Cryptosporidium, an apicomplexan parasite that causes diarrheal disease in both humans and livestock. We are primarily interested in parasite transmission. We have an emerging research focus in animal health. We collaborate with drug discovery scientists to develop new medicines and understand their mode of action.

https://pawlowiclab.org/

Dr Stefan Pulver

University of St Andrews

neuroethology, invertebrates, environmental science, sustainability accounting

I study the neuroethology of movement in small animals. I am particulraly interested in understanding how the brains of insects control complex physical plants to solve problems associated with moving over different types of terrain. Work in the lab is highly integrative, involving everything from genetics to anatomy to electrophyisology and live imaging to biomechanics and animal behaviour in the field. We work with multiple species including flies, beetles, and aquatic invertebrates. Our research is well positioned to inform work in vertebrates and influence development of biologically inspired machines. Lab members weave research, teaching and outreach together and we invest in developing environmentallly sustainable, accessible ways of doing science.

I work with a variety of for-profit and non-profit partners. Current collaborators are Buglife Scotland and Cairn Research Ltd.

https://www.st-andrews.ac.uk/psychology-neuroscience/people/sp96/

Dr Takanobu Tagawa

University of Edinburgh CSE

molecular virology, RNA biology, non-coding RNA, oncovirus, immune evasion

Herpesviruses persist in hosts in a latent programme during which viral protein levels are low and non-coding RNAs are the most abundant transcripts. We have conducted our research to understand how non-coding RNAs impact infection during latency in particular. We identified virus-encoded microRNAs that protect an oncogenic herpesvirus, Epstein-Barr virus (EBV), from host immunity. Using another oncogenic herpesvirus Kaposi sarcoma herpesvirus (KSHV), we showed how circular RNAs, a novel RNA species, manipulate the host to maintain infection. We are also among the first to identify virus-encoded circular RNA. Our current research focuses on understanding how circular RNAs control herpesvirus-host interactions. We aim to obtain mechanistic insights into how circular RNAs regulate the viral life cycle, antiviral immunity, and the tumour microenvironment. Using EBV and KSHV infection models and cutting-edge RNA-RNA and RNA-protein interaction analyses, we will identify and functionally characterise the host and viral circular RNAs that play key roles during infection and pathogenesis. In long-term, this foundational study to discover infection-regulating circRNAs may present novel biomarkers or druggable targets.

https://tagawa-lab.org/

Professor Neil Vargesson

University of Aberdeen

health and wellbeing, developmental biology, drug safety

My group is recognised for determining the mechanism by which thalidomide caused damage to the embryo. Thalidomide was used to treat morning sickness. Now its used to treat cancer and inflammatory disorders. We have also identified modified forms of thalidomide that no longer harm the embryo but which retain the clinically relevant benefits of the drug. We are also recognised for studying Primodos, which used to be a hormone pregnancy test, and has since been linked with causing birth differences. Our research in these areas has led to providing advice to governments and regulatory authorities around the world and has led to the establishment of compensation schemes in several countries. Current work in the lab is looking at limb development and outgrowth and the role of the forming vascular system in this process.

https://www.abdn.ac.uk/people/n.vargesson

Dr Mike Webster

University of St Andrews

animal behaviour, behavioural ecology

Our research has two strands. The first focusses on the social behaviour of animals. My group takes an experimental approach, using laboratory experiments and field studies to address questions in this area. We are interested in how and why animals form groups, taking in research into recognition, competition, social organisation, social learning and responses to environmental change. The second area is focussed upon how sampling biases and experimental design decisions affect experimental outcomes in animal behaviour. We study this experimentally and through meta-analysis, and advocate for clearer discussion of how sampling biases might have influenced findings in published research. We have produced a reporting framework, STRANGE, to guide these efforts.

https://sites.google.com/view/big-lab-webster/home?authuser=0

Dr Marcus Wilson

University of Edinburgh CSE

health and wellbeing, molecules, cells

We are interested in understanding how epigenetic marks are placed, read and interpreted on chromatin. Chromatin becomes decorated with post-translational modifications to control the myriad of DNA-related processes in the cell. We create modified chromatin using chemical biology and biochemical methods. We then use our defined modified chromatin to study individual nucleosome-chromatin protein complexes using single-particle cryo-electron microscopy (cryo-EM), Biochemical, Biophysical and Cell Biology approaches to investigate histone marks and DNA methylation.

Recently we have become particularly interested in how diverse eukaryotes, such as parasitic causative agents of neglected tropical diseases, use unconventional chromatin for unique and targetable cellular biology.

Open to developing projects with non-academic partners.

www.mdwilsonlab.com

Dr Ewelina Wójcik (Chief Scientific Officer)

Proteon Pharmaceuticals

bacteriophages, bacterial resistance, animal model

The research is focused on development of a pig model of urinary tract infection for phage therapy. This project aims to characterise the dynamics of the infection following phage delivery, including dissemination of phage and co-ordination with the inflammatory response. The major focus is on bacterial resistance to the phage treatment, which is investigated by sequencing isolates and studying their gene expression profile by RNAseq. The results are compared with data acquired on resistance mechanisms for the same strains under laboratory conditions. The results from this project should improve selection of phage for cocktails of treating multiple bacterial infections. This project will benefit from on-campus world-class facilities, including the Large Animal Research and Imaging Facility (LARIF) and the knowledge and resources provided by Proteon Pharmaceuticals, which has a platform to develop and commercialize phage-based products for animal and human health.

https://www.proteonpharma.com/

Dr Dewei Yi

University of Aberdeen

health and wellbeing; food and sustainability; technologies and methodological development

My research lies at the intersection of trustworthy artificial intelligence (AI), robotics, and intelligent systems, with a focus on addressing real-world challenges through technological innovation. As an Associate Professor at the University of Aberdeen, my work integrates cutting-edge AI techniques with embedded systems to create impactful solutions across healthcare, sustainable agriculture, and autonomous systems.

A central theme of my research is the development of lightweight AI models for embedded systems and robotics, funded by organizations such as the Petroleum Technology Development Fund and the UKRI BBSRC. My leadership in projects like Smartrawl, funded by Fisheries Innovation & Sustainability, has contributed to sustainable fishing by reducing bycatch using AI-driven monitoring systems. Similarly, my involvement in ASICA projects, funded by Cancer Research UK, has advanced digital healthcare interventions for melanoma survivors.

My research outputs, published in high-impact journals like IEEE Transactions on Industrial Informatics and Neurocomputing, span from underwater instance segmentation frameworks to AI-powered personalized healthcare systems. These contributions have direct societal impacts, evidenced by their inclusion in impact case studies in areas such as smart farming and remote healthcare solutions.

I am dedicated to fostering future talent, supervising PhD research in areas like federated learning for IoT cybersecurity and neuro-symbolic learning for autonomous grasping. Additionally, my collaborative efforts with leading institutions and industry partners enhance the practical applications of my research, bridging the gap between academia and industry.

My vision is to continue advancing AI technologies for societal good, focusing on sustainable systems, personalized healthcare, and intelligent autonomous solutions that address global challenges.

https://www.abdn.ac.uk/people/dewei.yi/

Dr Lida Zoupi

University of Edinburgh
CMVM

health and wellbeing, animal systems, neuroscience, neurodevelopment

We are interested in the fundamental cellular mechanisms that underly the establishment and regulation of neuronal networks in the brain during typical development and in the context of neurodevelopmental disorders. We focus on the communication between neurons and oligodendrocytes, a type of glia cell in the brain that wraps neurons with myelin, a specialised membrane that insulates the axons of neurons enabling fast and efficient signal transmission. We use genetic, environmental and pharmacological approaches to manipulate myelination during postnatal development and we study the effect on neuronal function. The nature and the outcomes of our work provide new conceptual insights into how myelinated neuronal networks regulate signal transmission and by extension influence information processing in the brain. In addition, we establish versatile and cutting-edge genetic approaches, protocols and analysis pipelines that we openly share with the broader scientific community to be used a wide range of researchers within the life sciences.

https://zoupilab.com/

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