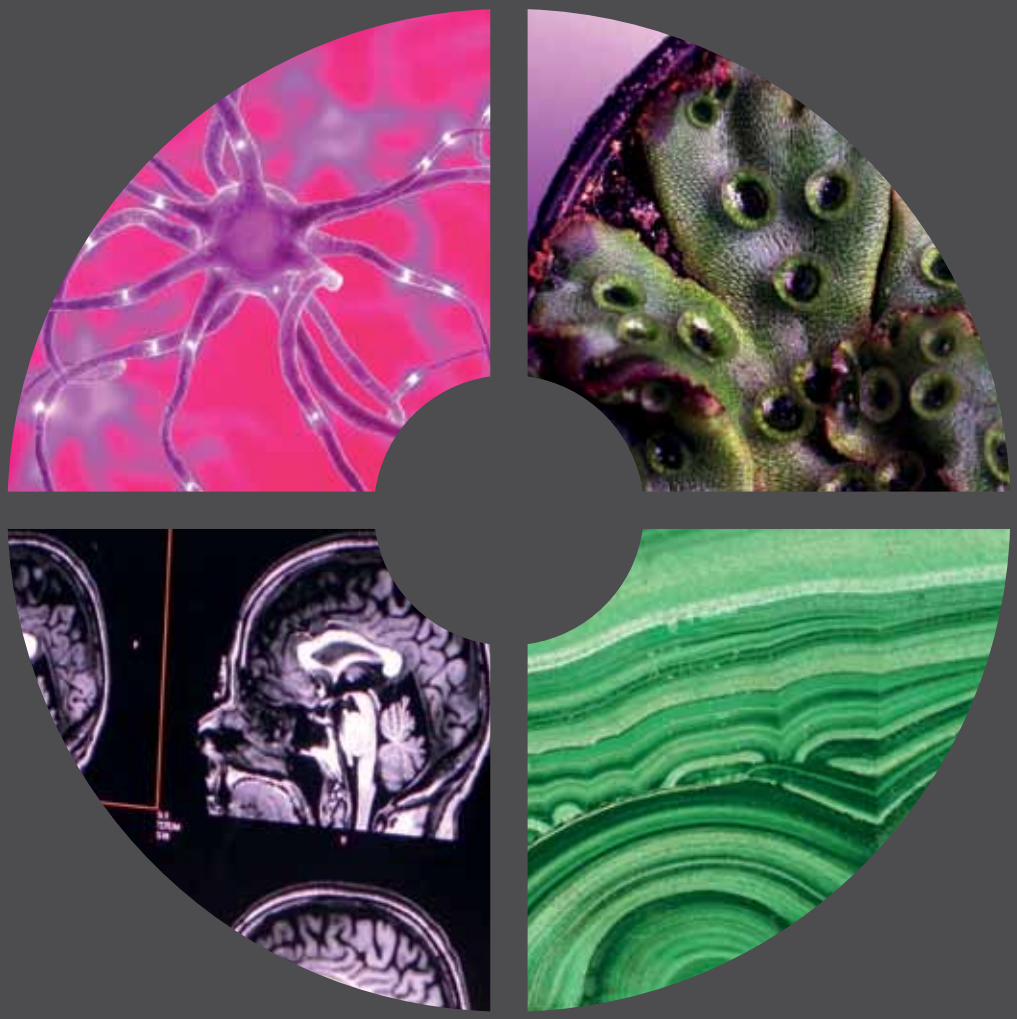
UNIVERSITY OF BIRMINGHAM

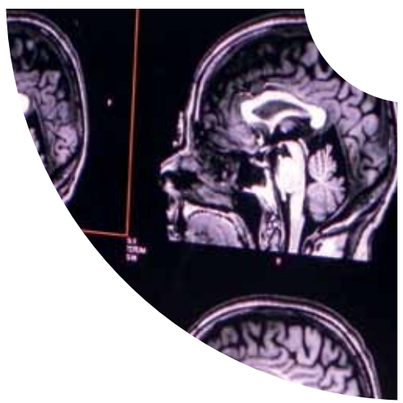
Research in the College of Life and Environmental Sciences

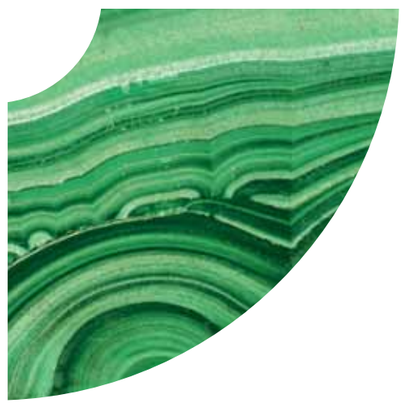


Business with Birmingham

Research in the College of Life and Environmental Sciences

The College of Life and Environmental Sciences is comprised of four Schools: Biosciences; Geography, Earth and Environmental Sciences (GEES); Sport and Exercise Sciences; and Psychology.





We span an enormous breadth of disciplines, from the biomedical to the social sciences, and our expertise aligns strongly with key international challenges, including lifelong health and well being, food security, energy security, and living with environmental change. We have a faculty of 210 academics, each with their own research group, and a total staff complement of around 600. The College is home to around 4000 full-time students studying a range of undergraduate, postgraduate and research programmes, our numbers swelled over the last year by the addition of the Centre for Urban and Regional Studies (moving from the Business School to GEES) and the Department of Sport Pedagogy (moving from the School of Education to the School of Sport and Exercise Sciences).

The 2008 Research Assessment Exercise (RAE) conducted by the Higher Education Funding Council for England (HEFCE) confirmed the pre-eminence of our School of Psychology, with 80% of our research falling in the highest two categories, 3* (internationally excellent) and 4* (world-leading), placing us in the top three nationally with Cambridge and Oxford. Sport and Exercise Sciences achieved a rating of 60% activity at 3*and 4*, placing us top with Loughborough. Biosciences and Geography, Earth and Environmental Sciences have distinctive areas in which they are internationally leading, including environmental science, molecular cell biology and molecular microbiology. With regard to the latter, we have recently formed an Institute of Microbiology and Infection, bringing together researchers from the School of Biosciences with scientists and clinicians in the College of Medical and Dental Sciences, allowing us to integrate our basic scientific and translational research in this key area.

Our strategy is to build around our strengths and to bridge these to cognate areas of activity both within the College and across the University. We have invested in new staff at both early career and professorial levels in each of our four Schools and have attracted more than fifteen independent research fellows in the last year alone. Academic staff are encouraged and supported to ensure that they can achieve their personal best, through advice and guidance from both senior academics and research support professionals.

The College has benefitted from significant University investment in key interdisciplinary research initiatives, including: Computational Neuroscience and Cognitive Robotics (in partnership with the School of Computer Science); Systems Science for Health (in partnership with the Schools of Mathematics and Computer Sciences and the College of Medical and Dental Sciences); and Resilience and Urban Living. These initiatives are not only helping to boost our research awards but are also designed to deliver new Masters level programmes, which are targeted at both UK and international students.

A new exciting development is a joint venture with the Beijing Genomics Institute (BGI), which will provide a world-class research and training centre on Birmingham's campus that integrates state-of-the-art approaches in molecular biology, including DNA sequencing, metabolomics and bioinformatics. Research will focus in three key areas: ways in which organisms respond to environmental change and the development of novel environmental diagnostic techniques; better understanding of disease susceptibility and treatment including advances in personalised health care and medicine; and advancing our understanding of the role that microbes play in infection and disease.

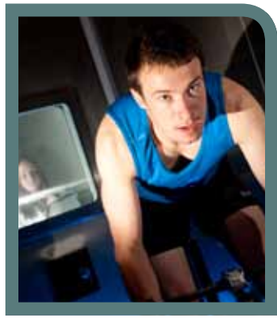
The College project portfolio reflects the breadth of funding that we attract, including links with industry, charities and policy makers, as well as research councils. For example, a Knowledge Transfer Partnership (KTP) with EON is identifying, modeling and predicting the impact of urban heat islands and climate change on the ageing rate of transformers while research on urban resilience is informing spatial planning and national security policy in both the UK and overseas (US, Russia and Israel). The outcomes of our fundamental and applied research have resulted in commercialisation activity, for example, a new clinical diagnostics system developed within the School of Biosciences resulted in the spin-out company Linear Diagnostics. Studies on stroke rehabilitation in our School of Psychology have spawned Cognition Matters. Knowledge transfer is recognised by the College as an integral part of research and has led to the establishment of a novel MSc in Entrepreneurship which will be expanded in 2013 to form a new Masters in Enterprise and Innovation in Biosciences programme.

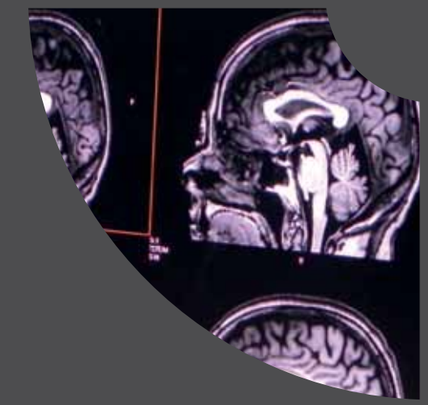
All of our research groups have international collaborators. As part of the University's international engagement strategy, we are building multi-disciplinary links with key partners across the globe and our College is at the forefront of these in USA (Chicago), India (Delhi) and China (Guangzhou). For example, our School of Psychology is conducting joint research with colleagues in the University of Chicago on social neuroscience, colleagues in GEES are working on sustainable cities with TERI University in Delhi as well as with partners in Guangzhou on environmental pollution.

It is a privilege to be leading a College with such an exciting and dynamic portfolio of research, where the combination of outstandingly able and driven colleagues, access to excellent equipment and facilities, and world leading collaborations with universities and industry both nationally and internationally, allow us to deliver paradigm shifting research with important impacts on individuals, communities and society.

Professor Malcolm Press,
Pro-Vice Chancellor and Head of College

College structure

School	Research Themes	Centre Links (internal and external to the School)
 Biosciences	■ Biosystems and Environmental Change ■ Molecular Cell Biology and Signalling ■ Microbiology and Infection ■ Plant Genetics and Cell Biology **Cross Research Themes** ■ Computational Biology ■ Structural Biology and Molecular Biophysics	■ Institute of Microbiology & Infection (Cross College) ■ Centre for Systems Biology ■ Systems Science for Health initiative (Cross College) ■ Centre for Environmental Genomics (emerging)
 Geography, Earth and Environmental Sciences	■ Environmental Health Sciences ■ Geosystems ■ Society, Economy and Environment ■ Water Sciences ■ Centre for Urban and Regional Studies (CURS)	■ Resilience and Urban Living initiative (Cross College) ■ The Service and Enterprise Research Unit
 Psychology	■ Behavioural Neuroscience ■ Developmental and Social Psychology ■ Language, Cognition and Perception ■ Applied and Health Psychology	■ Centre for Computational Neuroscience and Cognitive Robotics (Cross College) ■ Centre for Forensic and Criminological Psychology ■ Centre for Rational Emotive Behaviour Therapy ■ The Cerebra Centre for Neurodevelopmental Disorders ■ Medawar Centre for Healthy Ageing Research (Cross College) ■ Centre for Obesity Research (Cross College)
 Sport and Exercise Sciences	■ Exercise Physiology ■ Motor Control / Rehabilitation ■ Sport and Exercise Pedagogy including Sport Policy ■ Sport and Exercise Psycholoy with Behavioural ■ Medicine **Cross Research Themes** ■ Active Lifestyles ■ Effective Learning ■ Maximal performance ■ Movement Rehabilitation ■ Healthy Ageing	■ Medawar Centre for Healthy Ageing Research (Cross College) ■ Centre for Obesity Research (Cross College) ■ MRC-ARUK Centre for Musculoskeletal Ageing Research (Cross College)



Professor Kevin Chipman, Director of Research within the College

The College of Life and Environmental Sciences at the University of Birmingham encompasses four interactive Schools dedicated to fundamental research relating to human and environmental health. We are developing and promoting excellence in these research areas which feed into our related educational remit.

The research is underpinned by state-of-the-art facilities and ranges from molecular biology, imaging, remote sensing, field work and whole organism, including human, physiology and function. Through our excellent facilities and an interactive research environment, we provide defined areas of strong international research standing. We focus on studies to unlock the mysteries of life and environmental sciences and on extending knowledge of fundamental processes to areas of impact such as in agriculture, urban resilience, environmental quality, food security, human behaviour, understanding and treating disease and healthy ageing. Thus, building upon the basic sciences, there are many areas of applied research and technologies showing impact on human and environmental health.
Our activities are aided not only by effective collaborative interactions within the University, but also through strong alliances with other partners both nationally and internationally.

The College has witnessed a record research grant capture during the academic year 2011/12 and has forged ahead with a number of very high profile academic appointments with an associated expansion of the research support team. Particularly exciting is the continuing recruitment of a number of new Independent Research Fellows throughout the College funded by the Birmingham Fellowship Scheme for expansion of excellence.

This context places the College in a favourable position for a wide range of mutually beneficial interactions with industry and other users.

Research projects

Regulation of platelet and endothelial cell surface receptors by tetraspanin microdomains
British Heart Foundation

Novel methods for mapping quantitative trait loci in autotetraploid species
The Leverhulme Trust

STReP FURAN-RA: Role of genetic and non-genetic mechanisms in furan risk
Commission of the European Communities

Is oxidative stress the principal mode of toxicity for metal oxide nanoparticles?
Natural Environment Research Council

The molecular basis of latency and dissemination during cryptococcosis
Lister Institute of Preventative Medicine

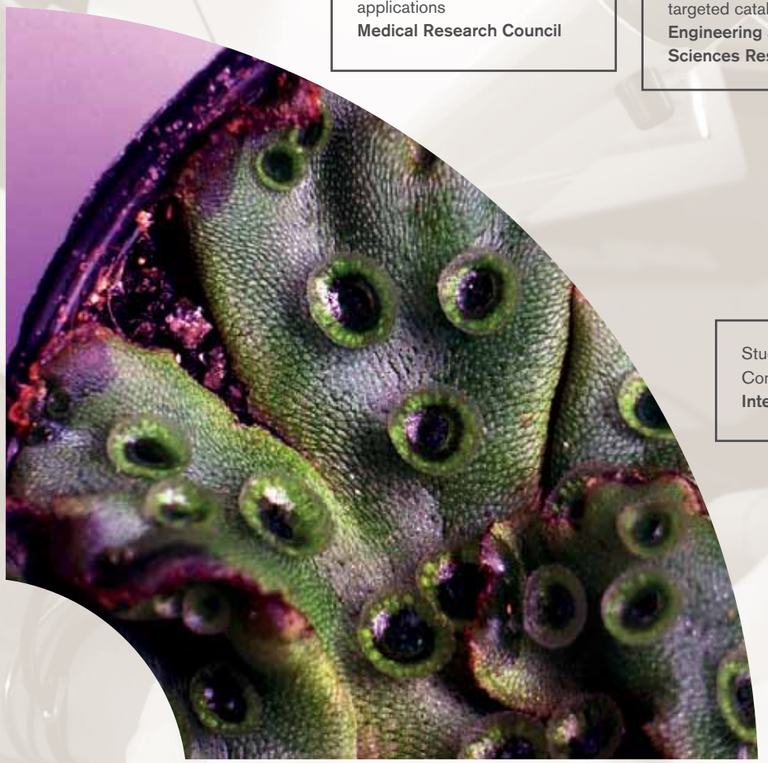
Confocal Microscopy for Time-lapse, FRET and Calcium Imaging Analysis of Cellular Processes
The Wellcome Trust

Meiosis in barley: manipulating crossover frequency and distribution (LOLA)
Biotechnology and Biological Sciences Research Council

Design, synthesis, and assessment of specific iNKT cell agonists for clinical applications
Medical Research Council

Functional bionanomaterials and novel processing for targeted catalytic applications
Engineering and Physical Sciences Research Council

Role of cytoglobin in the physiology of cellular redox disturbance in the liver
Astra Zeneca UK Ltd

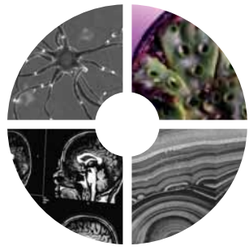


Characterisation of a Caspase-like Protein Activated by the SI Response in Papaver Rhoeas
Biotechnology and Biological Sciences Research Council

Studies on BioActive Compounds
International Paint Ltd

Analysis of Rho-ROCK signalling in human keratinocytes
Cancer Research UK

Analysis of the salivary proteome by FT-ICR-MS (Fourier Transform Ion Cyclotron Resonance Mass Spectrometry) Approach
Philip Oral Healthcare Inc



School of Biosciences

Professor Stephen Busby
Head of School

Research in the School of Biosciences ranges from work involving whole organisms and cells to atom-level studies of important molecules and macromolecules, and it aims to make big contributions to topics of current importance to society. The research is underpinned by world class support facilities such as our facilities for genomics, for metabolomics and for imaging, and a strong base in mathematical and computational biology, and in biophysics. The research benefits from strong interactions with colleagues in medical, chemical and engineering sciences in Birmingham and beyond, and also from our proximity to the new Queen Elizabeth 'superhospital' and the Royal Centre for Defence Medicine.

A major investment has recently been made to support the study of Biosystems and Environmental Change. The aim is to understand how life adapts to changes such as pollution and global warming, and to establish DNA and metabolite markers that can be used to identify risk. Hence, Biosciences is currently establishing a world-class Centre for Environmental Genomics and sponsors top class work in toxicology, host-pathogen interactions and vertebrate biology, with special emphasis on primates and ornithology.

Another area of significant strength is the newly created Institute for Microbiology and Infection which is a grouping of 20 investigators from different backgrounds. Major aims of the Institute are to develop new antibacterial reagents to tackle emerging disease such as TB, to understand host responses to bacterial infection and to exploit these to develop new types of prophylaxis, and to exploit recent advances in DNA technology to monitor and diagnose the evolution and dissemination of important bacterial pathogens and determinants for drug resistance.

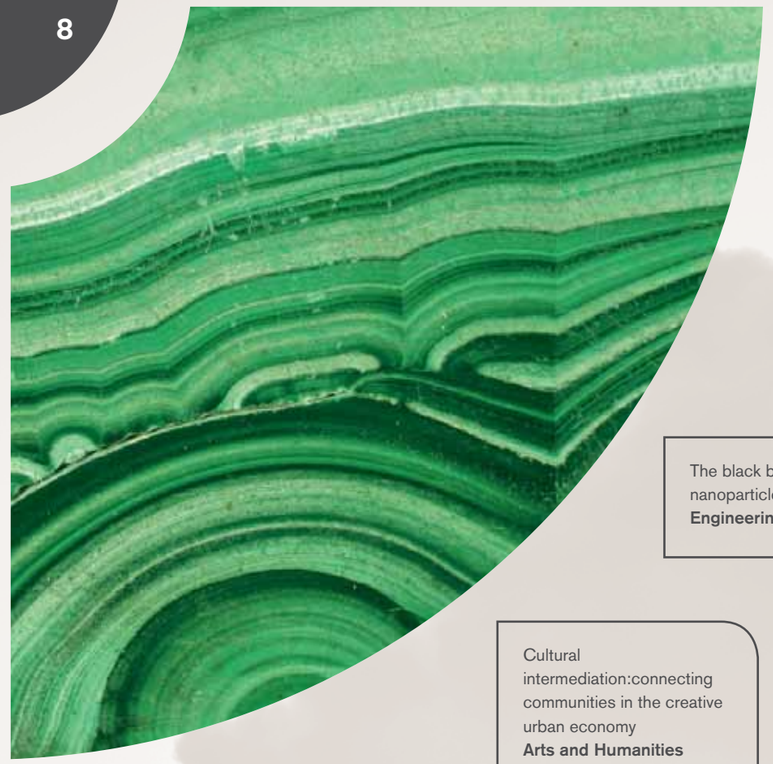
Long term research continues in Plant Genetics and Cell Biology, focussed on the genetic and cellular control of plant growth and development in model species, crops and their wild relatives. This work aims to address issues due to environmental change, and the need to improve food security and conserve plant genetic resources.

Another key research focus is in Molecular Cell Biology which centres on understanding mechanisms of fundamental cellular processes involved in organisation, signalling, growth and information transfer. This work is pursued in a range of tissue types and organisms, with a special focus on the development of nervous systems and tumour biology.

The development of whole-genome sequencing and functional genomics allows cells and organisms to be studied at unprecedented levels of detail at every level of biological organization, including quantitative measurements of gene expression, metabolite levels, protein-protein interactions and their structures.

Hence computational methods are being developed in order to organize and mine these datasets, and to generate systems-level models of biological processes and whole organisms. Studying cells, organisms, and ecosystems at a molecular level lets us elucidate fundamental principles that apply universally across all life forms, allowing us to understand the complex traits of living organisms, to devise therapeutic interventions in disease, and to limit and even reverse the environmental impact of human activity.

www.birmingham.ac.uk/biosciences



Research projects

Bioavailability and Effects in the Environment of manufactured nanomaterials (nanoBEE)
NERC, USEPA, EPSRC, DEFRA, Environment Agency

Designing Safer Urban Spaces (DESURBS)
Commission of the European Communities

The black box opened: Non-invasive observation of nanoparticle transport in rock pore systems
Engineering and Physical Sciences Research Council

Cultural intermediation:connecting communities in the creative urban economy
Arts and Humanities Research Council

Fluid dynamics across the interface in gravel-bed rivers: quantification and numerical modelling of flow in the hyporheic zone
Natural Environment Research Council

Measurement of sediment and silt flux in rivers, benefits of enhancement measures and policy implications
Environment Agency

Novel Flame Retardants in Water, Sediment and Fish from English Lakes
The Centre for Environment, Fisheries and Aquaculture Science

Women in the Russian Penal System: The role of distance in the theory and practice of imprisonment in late Soviet and post-Soviet Russia
Economic and Social Research Council

Characterising Human exposure to Organophosphorus Flame Retardants
The Food and Environment Research Agency

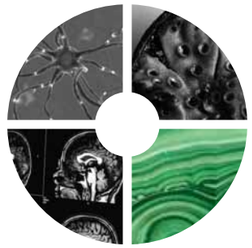
Projections and predictions of Local prEcipitation Intensities. Advanced Downscaling using Extreme value Statistics(PLEIADES)
Volkswagen Stiftung

Big Lottery Fund Grant (BLF) - Open Air Laboratories Network (OPAL)
Big Lottery Fund

Energy Vulnerability and Urban Transitions in Europe (EVALUATE)
Commission of the European Communities: European Research Council

Groundwater quality: Rigorous sampling and interpretation of long-screen well
Waterra UK Ltd

The Svalbard exemplar of Neoproterozoic glaciation
Natural Environment Research Council



School of Geography, Earth and Environmental Sciences

Professor Ian Fairchild
Head of School

The School of Geography, Earth and Environmental Sciences is renowned for international excellence in research and teaching. Our research and teaching address the key challenges of the 21st Century such as climate change, environmental stress, oil exploration, renewable energy, urbanisation, resilience and sustainability science.

Research in the School centres around five research groupings cutting across traditional discipline boundaries that respond to current international research agenda. They embrace a wide range of physical science, biological, and social sciences and humanities, linking across the College of Life and Environmental Sciences and to other colleges in the University.

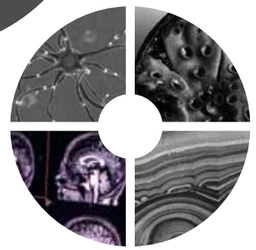
The Environmental Health Sciences Group addresses a range of research issues requiring the application of chemical and physical principles to the study of environmental processes and human health. There are three main research areas: Pollution; Climate and Atmosphere; and Environmental Nanoscience. The group has an excellent record of funding from research councils and government departments, the European Union (EU) and private industry. The Geosystems Research Group combines strong expertise in palaeobiology, geophysical and palaeoclimatic modelling, and geochemical and physical sedimentological approaches to understanding past environments to tackle a range of scientific questions concerned with the dynamic behaviour of our planet and its complex history. Research funding includes UK Research Councils, the EU, the petroleum industry and charities. We work with a wide range of collaborators in the UK and overseas, particularly Western Europe, the USA and Australia.

The Society, Economy and Environment Research Group conducts research aimed at understanding how social practices and relations are conditioned by space and place. Interests include Social and Cultural, Urban, Energy, Enterprise and Economic, and Environmental Risk geographies, with world-leading profiles in several areas. Research is funded by UK Research Councils, the EU, the UN, and a range of government bodies and charitable organisations from across the world. We engage strongly with decision-makers, especially in urban policy, renewable and low-carbon energy, nuclear waste management, fuel poverty, community resilience and climate change mitigation strategies.

The Water Sciences Group undertakes pure and applied research address questions of immediate concern to society and environment including both resources and pollution. Research includes hydrology, hydroclimatology, hydrogeology, biogeochemistry, geomorphology, ecology and modelling, and is funded by UK and overseas research organizations, industry, and international agencies. We work with other academic and industrial institutions in the UK and overseas, particularly in Europe, Asia and the USA.

The Centre for Urban and Regional Studies (CURS) is a leading international centre for research, teaching and consultancy in spatial and social planning studies, an academic and policy discipline that encompasses housing, regeneration, economic development, communities and the governance of public policy. It includes funding from UK Research Councils and Government, civil society groupings, the Joseph Rowntree Foundation, and the EU. The University has invested in the innovative research area of Resilience and Urban Living (RUL), which bridges the social and physical sciences.

www.birmingham.ac.uk/gees



School of Psychology

Professor Chris Miall
Head of School

The mission of the School of Psychology is to pursue research of international excellence. In both research and our research-led teaching the aim is to carry out work that has theoretical content and applied outcomes in practice, relevant to the broader community. The School is one of the strongest and most active psychology departments in the country.

The School is large with a majority of research active staff operating at an international level of research excellence, contributing to fundamental and applied psychological knowledge in a number of key areas. Excellent research opportunities are also provided by our links with local hospitals and clinics, local schools and nurseries, other University departments, industrial companies and departments of local and national government, both in this country and overseas. Work is supported by excellent facilities specifically equipped for work in human brain sciences (including brain imaging), psychophysiology, cognition and speech production, visual and auditory perception, food and nutritional psychology, psychopharmacology, social psychology, child development, clinical and forensic psychology. They include a 3T MRI (magnetic resonance imaging) scanner, several different EEG (electroencephalography) and TMS (transcranial magnetic stimulation) laboratories, state of art eye tracking systems, a fully equipped posture and balance lab, and the infant and child lab.

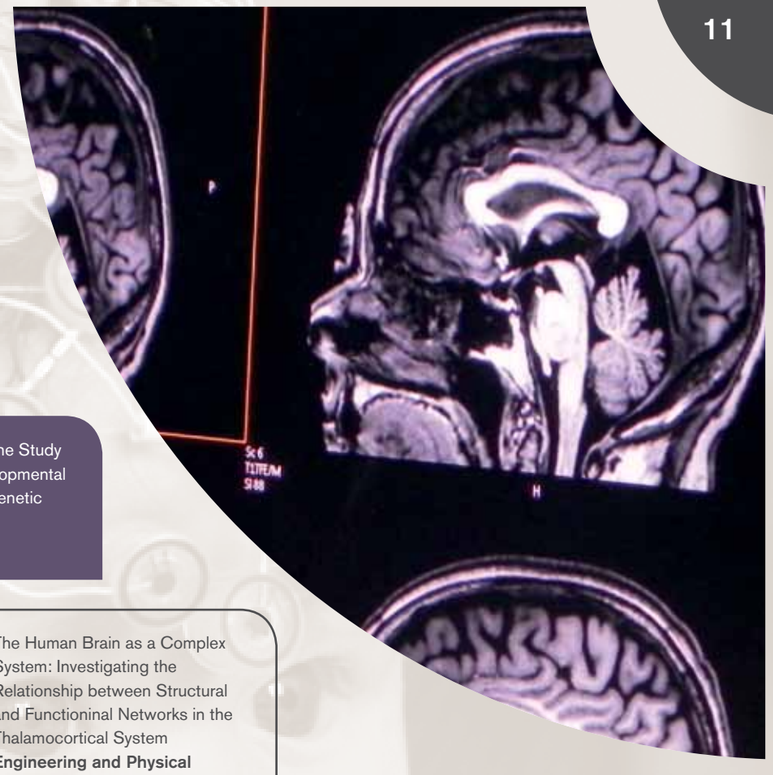
The School has a number of research strengths across many different areas of psychology – perhaps most notably in cognitive neuroscience (encompassing work on brain imaging, neuropsychology, perception, attention and sensory-motor systems), in developmental psychology and in psycholinguistics. There is also a notable gravitas in the neuroscience of memory, with links to neurophysiology within the University's College of Medical and Dental Sciences. In addition, there is excellent NHS-based research linked to the School in the field of psychosis and addiction. A relatively recent and exciting capability development is a strong core of computational neuroscientists within a new research centre, CN-CR (Centre for Computational Neuroscience and Cognitive Robotics) which is integrated with the Intelligent Robotics group in Computer Sciences at the University.

Psychology has an excellent track record of funding from a wide range of funding bodies including a number of government Research Councils (BBSRC, EPSRC, ESRC and MRC), charities (notably the Wellcome Trust, the Leverhulme Foundation, the Stroke Association and other charities dealing with developmental disorders), and from the European Commission through their Framework Programme 7 Collaboration initiative. Strong links with a variety of users and stakeholders ensures that effective knowledge exchange occurs, such as into the health service and prison services both through our applied courses and our applied research in neuropsychology.

www.birmingham.ac.uk/psychology

Research projects

A Centre for the Study of Neurodevelopmental Disability in Genetic Disorders
CEREBRA



Decoding Dorsal Depth processing in the human brain
The Wellcome Trust

The Human Brain as a Complex System: Investigating the Relationship between Structural and Functionial Networks in the Thalamocortical System
Engineering and Physical Sciences Research Council

MultSENS: Limits and pre-requisitions of information integration in the human brain; attention, awareness and vigilance
Commission of the European Communities: European Research Council

Behavioural and psychological problems in children with exaggerated adrenarche
Child Growth Foundation

Responsiveness to food cues in adolescents with type 2 diabetes
European Foundation for the Study of Diabetes

The role of group process factors in group member satfisfaction and successful completion of sex offender treatment: A multinational examination
The National Organisation for the Treatment of Abusers

Cortical hyperexcitability and the Out-of-Body Experience (OBE)
The Leverhulme Trust

Probing light touch contributions to elderly balance
Biotechnology and Biological Sciences Research Council

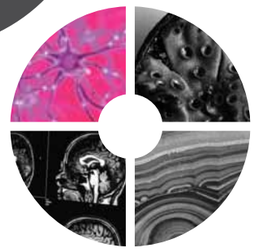
Psychological and Social Factors associated with Coeliac Disease across the lifespan in the UK: the role of self-efficacy and illness representation in understanding adjustment and adherence
Coeliac UK

When and why do humans fail to use their 'theory of mind'?
Economic and Social Research Council

A recipe for success: evaluating prompting as a strategy for successful introduction of new foods to toddlers
Nutricia Ltd

Autism and Self Injurious Behaviour
National Autistic Society

Form processing in peripheral vision
University of Southern California, USA



School of Sport and Exercise Sciences

Professor Kathleen Armour
Head of School

The School of Sport and Exercise Sciences conducts world leading research in the sciences of sport, exercise, health and rehabilitation.
The mission of the School is to address one of society's most pressing needs: increasing the quantity and quality of engagement in physical activity to enhance health and wellbeing. The School was ranked joint first in the UK for its research quality in the last research assessment exercise (RAE 2008).

The work of the School is driven by outstanding research in its core disciplines spanning the natural and social sciences. Examples include: exercise physiology, sport and exercise psychology, sport pedagogy (coaching and teaching), motor control, sport policy and management; behavioural medicine, and areas relating to sport performance. In addition, collaboration across disciplines allows the School to develop multi-disciplinary and interdisciplinary research around five major research themes:

- Active Lifestyles
- Effective learning
- Maximal performance
- Movement Rehabilitation
- Healthy Ageing

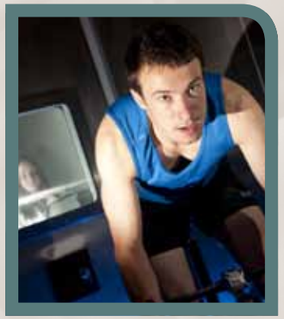
The School attracts research funding from a wide variety of funders including the MRC, ESRC, AHRC, and BBSRC, the EU, charities such as Diabetes UK, the Coca Cola Foundation, Alzheimers Research, UK, Arthritis Research UK and the British Heart Foundation, and sports bodies such as the FA and UK Athletics. In addition, the School attracts industry funding both in the form of CASE studentships, for example with GlaxoSmithkline, and in project funding, for example Unilever and Astra Zeneca.

The School boasts the largest custom-built Sport and Exercise facility in the UK, with research labs dedicated to exercise testing and sample analysis across the spectrum of sport and exercise sciences including: physiology, biochemistry, psychophysiology, biomechanics, sport psychology, motor skills, immunology, muscle mechanics and the neurophysiology of movement. In addition, the School uses a wide range of practical spaces for professional and vocational related research.

The School collaborates widely across and beyond campus to achieve its research mission. Notable collaborations include: the Medical School, University Hospitals Birmingham, Physiotherapy and the Schools of Biosciences and Psychology for health-related aspects; the Business School and School of Government and Society for sport policy and participation; the School of Education for teaching and coaching; and University of Birmingham Sport for sports participation and performance. The School also works closely with professional sports and practitioner bodies, and we have developed unique research and education partnerships with, among others, the Professional Golfers' Association and the Football Association. With this range of outstanding collaborators, on and beyond campus, the School is ideally placed to tackle some of the most challenging physical activity questions facing contemporary societies.

www.birmingham.ac.uk/sport-exercise

Research projects



CLIMBS at Work: Calorie Labelling at Intake and Modified Behaviour for Stair choice
The Bupa Medical Foundation Limited

Blunted physiological reactions to acute psychological stress: A novel marker of risky behaviour, addiction, and poor health?
AXA Research Fund

PAPA : Promoting Adolescent health through an intervention aimed at improving the quality of their participation in Physical Activity
Commission of the European Communities

Is altered respiratory-sympathetic coupling a pathogenic feature of human hypertension?
British Heart Foundation

Development of Clinical Tests of Motion Perception
US Air Force

Active Lifestyles – Physical Literacy as a way to promote physical activity in inactive groups
Coca Cola Foundation

External Evaluation of Mentoring in the National Coach Development Programme
UK Athletics

Behavioural Adjuvants: developing an acute exercise protocol to enhance influenza vaccine efficacy
Action Medical Research

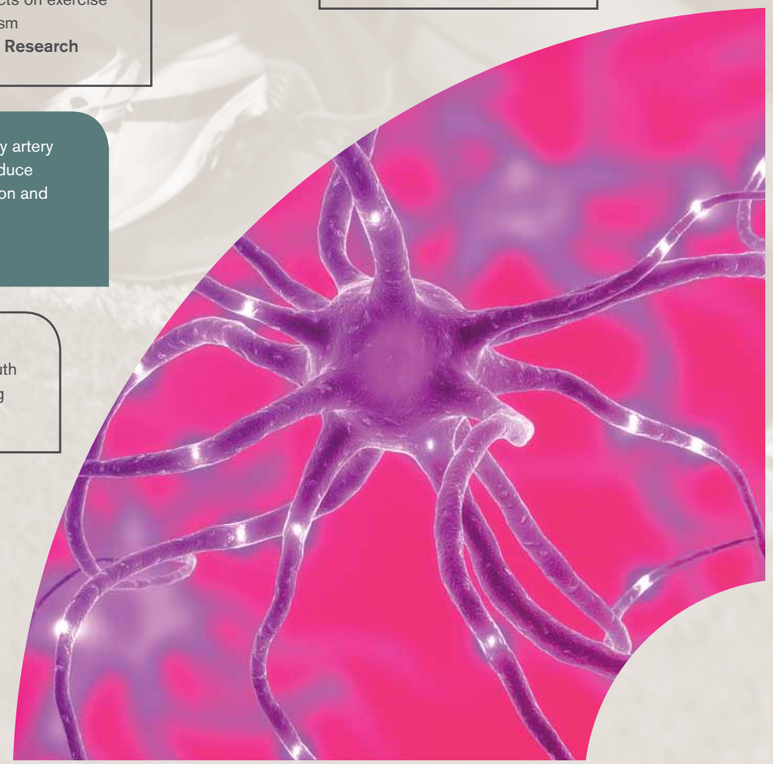
The effects of green tea extracts on exercise metabolism
Unilever Research

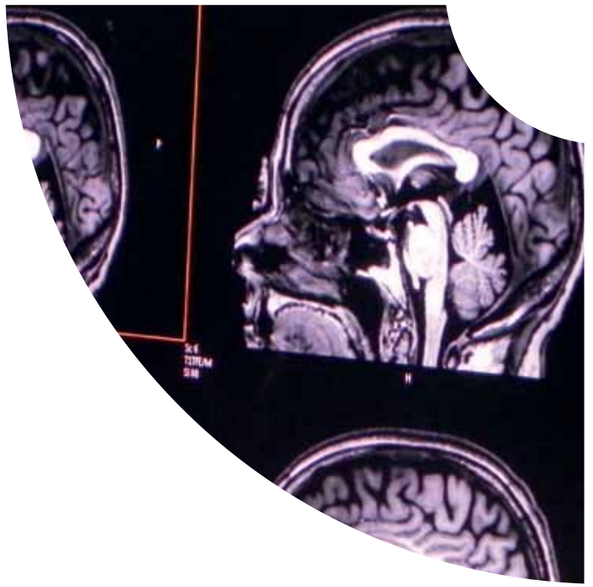
Improved diagnosis of early coronary artery disease using new technology to induce hypocapnic coronary vasoconstriction and reduced myocardial O2 availability
Department of Health

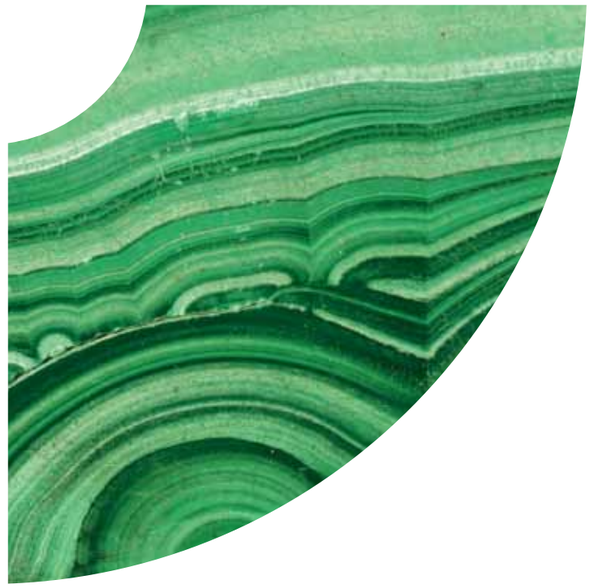
Comparing coach, parental and peer motivational climates in youth sport: Implications for well-being
The Nuffield Foundation

The Social and Cognitive Neuroscience of Performance under Pressure
Economic and Social Research Council

Revealing novel nutritional strategies to modulate fuel metabolism
GlaxoSmithKline







Links to cross-college centres and initiatives

Centre for Computational Neuroscience and Cognitive Robotics
The Centre is hosted by the School of Psychology and is served by a core MRI facility. It provides a centre of excellence for applied cognitive neuroscience and cognitive robotics, with translational applications in brain injury, ageing, developmental and adult neurological disorders, and assistive and rehabilitative robotics.

MRC-ARUK Centre for Musculoskeletal Ageing Research
This collaborative research venture between the Universities of Birmingham and Nottingham aims to understand how ageing results in loss of musculoskeletal function and to use this knowledge to intervene and minimise age-related musculoskeletal decline and disease. The major focus of the interventions is on exercise and diet, incorporating motivational psychology research to underpin improved uptake and adherence to lifestyle changes. The Centre is supported by the School of Sport and Exercise Sciences.

Institute of Microbiology and Infection
The Institute is hosted by the School of Biosciences and has a diverse research portfolio, ranging from the fundamental science of model organisms to translational research on key pathogens of medical and veterinary importance. It is supported by the establishment of the Surgical Reconstruction and Microbiology Research Centre and a high throughput screening unit for antimicrobial drug discovery.

Centre for Obesity Research
The Centre for Obesity Research at the University draws on existing research excellence across many schools and has a fundamental collaborative, multidisciplinary ethos reflecting the complex nature of obesity and metabolic disease. It co-ordinates research across the University from psychology, bioengineering, social sciences and chemical engineering through to medical science with the aim of understanding the metabolic processes that contribute to obesity and metabolic disease as well as implementing novel treatment and prevention strategies. Both the Schools of Psychology and Sports and Exercise Sciences support the Centre.

Systems Science for Health initiative
Systems Science is creating an exciting shift in translational biomedical research. Facilitated by recent technological and conceptual advances, systems science uses an integrative approach to study the complex interactions between the components of a system. The initiative is hosted by the School of Biosciences and spans three of the five Colleges at the University, with the necessary critical density and complementary expertise to focus multiple disciplines towards several linked goals:

- to better understand mechanisms of disease
- to expedite the discovery of novel biomarkers of disease
- to derive novel targets for therapy
- to characterise susceptibility and responsiveness to treatment

Based upon the University's existing internationally-recognised strengths, Systems Science for Health will target haematological malignancies and lipid-related diseases encompassing inflammation and obesity. Ultimately this initiative seeks to improve our understanding of health and disease and to facilitate improved patient care.

Medawar Centre for Healthy Ageing Research
The Centre covers broad interests in relation to ageing in the immune system, dental infection, physical activity, neurosciences, cardiovascular health, obesity and social contexts to significantly improve quality of life in old age and health and social sciences provision. Both the Schools of Psychology and Sport and Exercises Sciences support the Centre.

Resilience and Urban Living initiative
This initiative is hosted with the School of Geography, Earth and Environmental Sciences and brings together geographers, engineers and social scientists exploring the material nature of the built environment and the social, economic, cultural factors underpinning urban living, with psychologists working on cognitive, affective and social processes that influence behaviour and support adaptation to and utilization of urban environments.The research is clustered around a number of key themes;

- Enhancing the economic resilience of cities and regions
- Responding to insecurity and disaster
- Developing community and neighbourhood resilience
- Adaptive human behaviours
- Responding to demographic change
- Energy resilience and adapting to climate change.

College facilities

For further information on any of our research activity, please get in touch with one of the relevant members of staff below:

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Facilities and services

- DNA Sequencing Services
- Microarraying Facility
- Agilent Microarray Service
- Proteomics Services
- Metabolomics Service
- Real-time PCR Services
- Genotyping Service and Facility
- Flow Cytometry Facility
- Advanced Mass Spectrometry Facility
- Birmingham Biophysical Characterisation Facility (BBCF)
- Birmingham Advanced Light Microscopy facility (BALM)
- Macromolecular X-Ray Diffraction Facility
- High Throughput Gene Sequencing Facility and Service
- Birmingham University Imaging Centre (BUIC)
- Horticultural Services
- Rock Sectioning Service
- NERC Faciliy for Environmental Nanoscience Analysis and Characterisation (FENAC)
- NERC Biomolecular Analysis Facility (NBAF) for environmental metabolomics

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