



The
University
Of
Sheffield.

Faculty of Medicine Dentistry and Health.

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“Together, we offer the potential to develop new interdisciplinary approaches to teaching and research in response to national and global health questions and needs.”

2011
THE AWARDS
AWARD WINNER
UNIVERSITY OF THE YEAR

Welcome to the Faculty of Medicine, Dentistry and Health

It is my great pleasure to introduce you to the Faculty of Medicine, Dentistry and Health at the University of Sheffield. Formed in 2008, the Faculty brings together clinical and health-related subjects across a broad combination of disciplines and expertise. Together, our Faculty includes:

- The School of Clinical Dentistry
- The School of Health and Related Research (ScHARR)
- The Department of Human Communication Sciences
- The Medical School
- The Department of Cardiovascular Science
- The Department of Human Metabolism
- The Department of Infection and Immunity
- The Department of Neuroscience
- The Department of Oncology
- The School of Nursing and Midwifery.

We have developed an exciting environment of learning, research and clinical activity to tackle some of the major diseases and problems facing society today. Our collaborations in teaching and research span the continents and staff and students travel far around the world, applying and expanding their knowledge. We are committed to an ethos of excellence – in learning and in patient care – and we contribute comprehensively and wholeheartedly to the University's guiding principles: achieving excellence; cultivating ambition; working together; protecting the future; making a difference and leading the way.

Our schools and departments encompass a broad spectrum of expertise, enabling us to examine problems in new ways and to tackle important societal questions from a strong position. By bringing our research experts and acclaimed educators together, we offer the potential to develop new interdisciplinary approaches to teaching and research in response to national and global health questions and needs. The breadth of our expertise also enables us to look holistically at health conditions and find new answers to these problems.

We are intrinsically linked to the NHS and are proud of our extensive collaborations with health partners, providers and policy-makers regionally and nationally. We are committed to ever-stronger partnerships with organisations at the forefront of health research and policy to extend the reach of our life-changing work.

The Faculty's work makes a positive impact on people's lives by addressing the biggest health challenges facing our country, our health service and our world today. I hope that you enjoy reading about our work and that you will feel inspired to work with us on these major challenges.

Our mission is to be a health sciences faculty distinguished by excellence in:

- **learning, teaching and the student experience;**
- **internationally leading research and its translation into practice;**
- **regional and global impact on human health and patient care.**

Faculty Director of Operations,
Mrs Susan Bridgeford MA Hons, MBA
s.bridgeford@sheffield.ac.uk



A handwritten signature in black ink, which appears to read 'A Weetman'.

Faculty Pro-Vice-Chancellor, Professor Tony Weetman

About the University of Sheffield



The University's purpose has long been to improve the world by seeking to better understand it. Our motto – Rerum Cognoscere Causas – comes from Virgil's Georgics and means 'to know the causes of things'. We now define the University's mission in more contemporary language as 'to discover and understand'.

We remain committed today to the goal of changing the world for the better through the power and application of ideas and knowledge. The University received its royal charter in 1905. Today it employs over 5,000 staff and delivers programmes to more than 20,000 students from 130 different countries.

“Sheffield is one of the UK’s leading universities. International, world-class research underpins teaching excellence delivering a student experience ranked top 5 in the UK.”

Times Higher Education Supplement, 2010.



With five faculties covering *Arts and Humanities*, *Social Sciences*, *Science*, *Engineering* and *Medicine*, *Dentistry* and *Health*, the University’s knowledge spans a vast array of disciplines, making it one of the leading centres of research and education in the UK today.

In 2011 we were named University of the Year at the Time Higher Education Awards for our many imaginative and innovative initiatives as well as our exceptional performance in research, teaching, access and business performance. The recent National Student Survey placed us top 10 in the UK for student satisfaction and first for library facilities. We are a university that is focused on discovery and innovation in a world-class, supportive and friendly environment. In the 2008 National Research Assessment Exercise, 93 percent of the University’s research was regarded as internationally significant or world leading.

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Learning and Teaching in Faculty of Medicine, Dentistry and Health

Learning, teaching and the student experience

Delivering world-class graduates with the knowledge society needs is central to our collective mission of excellence in learning and teaching. With first-class facilities and researchers who are leading the world, students in each of our programmes enjoy a dynamic and stimulating learning environment.

Students can be confident in developing the knowledge, skills and expertise which will make them excellent health practitioners and citizens. The opportunity to study with staff at the cutting edge of research and our close collaboration with the NHS provide students with outstanding clinical and practice-based learning opportunities. In addition, a number of staff hold national and senate learning and teaching awards. Almost 2,000 undergraduate and 800 postgraduate students study in the Faculty on over 50 different programmes.

All our students are encouraged to develop skills in: the effective use of evidence; inter-professional collaboration and teamwork; adaptability to uncertainty; preparation for employment; personal responsibility; and continuing development of professional knowledge and skills. Opportunities for study abroad, student volunteering and student societies ensure a rich learning experience.

Our undergraduate degrees and diplomas cover the following subjects:

- Dental Hygiene and Therapy*
- Dental Surgery*
- Health and Human Sciences
- Health and Social Care Studies (Acute High Dependency and Critical Care)
- Health and Social Care Studies (Neonatal Intensive Care)
- Health and Social Care Studies (Ongoing and Supportive Care)
- Health and Social Care Studies (Primary Care and Public Health)
- Health and Social Care Studies (Sexual Health)
- Human Communication Sciences
- Language and Communication Impairment in Children
- Medicine*
- Orthoptics*
- Speech Science.*

*Leads to professional registration

For further information see:

www.sheffield.ac.uk/undergraduate/

Postgraduate study is available in four principal areas: clinical and professional; medical science; public health; and health economics, informatics and research.

Clinical and Professional Programmes:

- Acute Care (Nursing)
- Advanced Nursing Studies
- Advancing Practice (Nursing)
- Cleft Palate Studies
- Clinical Communication Studies*
- Clinical Neurology
- Dental Implantology
- Dental Materials Science
- Dental Public Health
- Diagnostic Oral Pathology
- Emergency Medicine
- Health Care Studies
- Integrated Academic Training Programme
- Language and Communication Impairment in Children
- Long Term Conditions (Nursing)
- Maternity Care
- Medical Education
- Midwifery
- Neonatal Intensive Care
- Nursing Studies*
- Orthodontics
- Paediatric Dentistry
- Periodontology
- Restorative Dentistry
- Speech and Cleft
- Speech Difficulties
- Vision and Strabismus

Medical Science Programmes:

- Human Nutrition
- Molecular Medicine (pathways in Cancer, Cardiovascular Science, Genetics, Experimental Medicine and Neurosciences)
- Translational Neuroscience

Public Health Programmes:

- Dental Public Health
- European Public Health
- Public Health
- Public Health and International Development
- Public Health, Management and Leadership
- Public Health (Health Services Research)
- Social Science and Oral Health
- Social Science and Health

We have around

2,000

undergraduate students, and approximately

800

postgraduate students



Health Economics, Informatics and Research Programmes:

- Clinical Research
- Economics and Health Economics
- Health Economics and Decision Modelling
- Health Informatics
- Health and Social Care Research
- Human Communication Sciences
- International Health Technology Assessment, Pricing and Reimbursement
- Statistics with Applications in Medicine.

**Leads to professional registration*

For further information see:

www.sheffield.ac.uk/faculty/medicine-dentistry-health/postgraduate

Faculty Director of Learning and Teaching
Mrs Margaret Freeman, MPhil, MEd, MRCSLT (Reg)
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Additionally, research programmes leading to PhD, MPhil or MD are available across the Faculty. Around 250 research students study with us each year.

Scholarships, advice and a tailored skills development programme are available through the Faculty Graduate School.

For further information:

www.sheffield.ac.uk/faculty/medicine-dentistry-health/graduateschool/prospectivpeg

Head of the Graduate School
Professor Ian Douglas, BSc, PhD, ILIM
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Widening participation

Cultivating ambition

For over 10 years **Sheffield's Outreach and Access to Medicine Scheme (SOAMS)** has encouraged young people from non-traditional backgrounds to pursue a career in medicine. With over 300 young people participating each year, the scheme has demonstrated outstanding success. More than 60 percent of participants have progressed to a higher education course (26 percent of these onto medicine programmes).

The **Access to Dental Occupations: Practice and Tutoring Scheme (ADOPT)** was launched in 2007 to encourage post-16 students to consider a career in dentistry or associated disciplines. ADOPT is yielding encouraging early results and shows every sign of being as successful as SOAMS in stimulating progress into professional higher education courses by non-traditional participants.

Students at the School of Nursing and Midwifery are from widely diverse backgrounds and bring an impressive range of experience and life skills to their studies. The School has recently signed progression agreements with seven local Further Education Colleges to enable students from vocational education backgrounds and under-represented groups to enter a programme in health and human sciences, leading to careers in health and social care services.

Working with our NHS partners, we are committed to maintaining and expanding access to healthcare study and work, regardless of background.

More than

60%

of participants have progressed to a higher education course



Our research

Leading the way

Internationally excellent research is conducted across all areas of the Faculty. Our research sponsors include UK Research Councils, International and UK Charities, UK Government, the European Union, International and UK industry and research agencies, the NHS and many others.

Our annual research portfolio is in excess of £30 million. A recent key development was the opening by Her Majesty The Queen in 2010 of a new state-of-the-art £18 million research institute in translational neuroscience (SITraN) set to make Sheffield a world leader for research into motor neurone disease.

The excellence of our translational research agenda was recognised in 2008 when the Sheffield Teaching Hospitals NHS Foundation Trust, in partnership with the University, was awarded funding of over £7 million by the National Institute for Health Research (NIHR) to create two Biomedical Research Units in Cardiovascular and Musculoskeletal disease. Led by Faculty clinical professors, each of the units has driven forward translational and clinical research for patient benefit. Key research programmes are in coronary artery disease, pulmonary vascular disease, osteoporosis and metabolic bone disorders.

Through the Collaboration for Leadership for Applied Health Research and Care (CLAHRC) South Yorkshire, Faculty staff are making a major

contribution as directors and leaders of research themes in: tele-health and care technologies (TACT); stroke; obesity; diabetes; chronic depression; and health inequalities. This is an ambitious five-year programme involving partnership between universities and a wide range of NHS and health organisations in the region.

We are also home to the National Institute of Health and Clinical Excellence (NICE) Public Health Collaborating Centre, based in the School of Health and Related Research (ScHARR). This multi-disciplinary group is one of two centres nationally, providing the evidence reviews and cost-effectiveness modelling to support the development of national public health guidance for implementation by NHS commissioners and providers.

In 2011 in partnership with Sheffield Teaching Hospitals and Yorkshire Cancer Research we were designated a centre of excellence for cancer research by Cancer Research UK. The Sheffield Cancer Research Centre, jointly funded by CRUK and Yorkshire Cancer Research, is one of an elite network of cancer centres across the UK, specialising in breast, lung and bone cancers and fundamental cancer biology. In collaboration with the Universities of Liverpool and Newcastle, we are also establishing a Medical Research Council and Arthritis Research UK Centre for Integrative Musculoskeletal Ageing.

Faculty Director of Research and Innovation
Professor Paul Hellewell BSc, PhD
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NIHR Clinical Fellow Dr Johnathan Cooper-Knock introduces his work to The Queen and Professor Pamela Shaw.



Training the next generation: The Think Ahead programme

Protecting the future

We are committed to developing all our staff. The Faculty Early Career Group has pioneered a tailored training programme for early career researchers to provide them with specific skills to meet future employers' needs. Known as 'Think Ahead', the programme includes employer-led career days, workshops on working-based learning opportunities and tailored support to prepare for the end of a contract. Shortlisted for a Times Higher Education award in 2011, this programme has been at the forefront of developing research staff for careers in academia, industry and beyond.

Find out more at:

www.sheffield.ac.uk/faculty/medicine-dentistry-health/thinkahead

Think
Ahead



Innovation

Making a difference to human health and patient care

The Faculty's healthcare research and innovation translates into real impact on patient care and policy. Our researchers and academics work closely with clinical partners, patients, industry and government agencies to ensure that research is mapped against societal need and answers questions that help our hospitals and our governments deliver genuine improvements to health and care.

We use a range of methods to ensure our research outputs make a real difference. Clinical trials, spin-out companies, knowledge transfer partnerships, licences and patents are all used to translate research into useable outputs so that findings get beyond the lab and seminar room into people's lives.

To make these processes as easy as possible we have developed a gateway for collaboration and innovation management between healthcare researchers, practitioners, policy makers and industry:

The Sheffield Healthcare Gateway puts researchers in touch with industrial and clinical partners, identifies funding and potential investors and acts as a one-stop shop for managing commercial opportunities arising from research.

Sheffield Healthcare Gateway.

See: <http://shg.sheffield.ac.uk>

With Fusion IP, the University's commercialisation partner, spin-out companies and licences produced by the Faculty include:

Asterion

Developing long-acting biopharmaceutical products for the treatment of serious and chronic growth hormone disorders.

Zilico

Developing a real-time cervical cancer detection device.

SWORD

The first and only worldwide evidence-based speech therapy software for the treatment of apraxia of speech following stroke.

Adjuvantix

Enhanced vaccine adjuvant system for the treatment of cancer and infectious disease.

Diurnal

Creating replacement hormone products that mimic the body's natural hormone rhythms, used in the treatment of adrenal insufficiency (cortisol deficiency).

Medella Therapeutics

Developing new monoclonal antibody drugs that stop cancerous tumours growing and have fewer side effects than currently available therapies.

Faculty Innovation Lead:

Professor Richard Ross, MD FRCP

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Working together

Education and training

Partnership and collaboration with the NHS is fundamental to all that we do. Our teaching and translational research agenda – leading to innovations in care – depend on the links we have with hospitals, practitioners, health agencies, policy makers and patients across the region and the country.

We are proud to work in partnership with Sheffield Teaching Hospitals NHS Foundation Trust (STHFT) – the second largest NHS Trust in England and one of the best performing NHS organisations in the country in the last five years. The Trust was recently awarded the accolade of Dr Foster Trust of the Year (North) – the third time in five years it has won this distinction. Over 100 of our staff are clinicians, delivering medical and dental services in our partner hospitals. Being located right next door to STHFT, our medical and dental students have easy access to clinical medicine and dentistry in an ideal setting, supported by a large number of experienced and committed clinical staff, many of whom have national and international profiles. All consultant staff in the Trust have an honorary senior academic position within the University.

STHFT staff, working with academic staff in the Medical and Dental Schools contribute to all aspects of undergraduate education. They are key to the design, delivery and quality assurance of the curriculum and their involvement helps ensure that graduates are well prepared for clinical practice.

In the allied health professions, we provide NHS-commissioned training in speech and language therapy, dental hygiene and orthoptics. We also provide continuing professional development for healthcare professionals across our region. Through these contracts we train over 200 NHS staff per year. In addition, we provide a wide range of training, professional development and support to NHS colleagues. Specific roles include: provision of expertise and support to South Yorkshire Primary Care Trusts through honorary contracts; support for Public Health trainees on both the Yorkshire & Humber and East Midlands training schemes; secondments for NHS staff, either to facilitate training and career development or for the duration of a research project; and provision of CPD and training through Masters-level modules or tailored short courses.

Research

A new Clinical Research Office in partnership with STHFT has recently opened to assist researchers conducting clinical research in both the University and STHFT. The office provides a comprehensive one-stop-shop service for clinical research, offering a streamlined approach to the stimulation, training, support, governance and costing of clinical research in Sheffield. This follows on from the success of our Clinical Research Facility, in partnership with STHFT, which offers purpose built, state-of-the-art, dedicated research facilities and a specialist environment for high-quality clinical research.

www.sheffieldclinicalresearch.org

Together with Sheffield Health and Social Care Trust we have set up joint academic initiatives for the treatment of patients with psychosis that includes community care, intensive care and rehabilitation services. Through our research based in SCANlab in Academic Clinical Psychiatry we are applying novel treatments to help reverse hallucinations and neurocognitive deficits in those who suffer from schizophrenia.

We are also proud to work with Sheffield Children's Hospital NHS Foundation Trust, one of four independent children's trusts in England, and we are partners in the creation and continuing development of the first Children's Clinical Research Facility in the UK, part of the UK Medicines for Children Research Network. Faculty staff in Academic Child Health direct research programmes in paediatric bone metabolism, endocrinology, diabetes and radiology.

Our School of Health and Related Research (ScHARR), works with numerous NHS organisations across the country including NHS Direct, the East Midlands Ambulance Service and many other NHS Trusts, on national programmes and multi-centre trials and collaborations. Its clinical and health services research is embedded in the NHS nationwide. A very important link to the NHS is via ScHARR's involvement and contribution to the work of the National Institute for Health and Clinical Excellence (NICE). ScHARR has more involvement with NICE than any other organisation in the country.

“As a result of our research we hope to improve treatment, reduce NHS costs and improve quality of life for UK citizens across a variety of medical conditions.”



Faculty departments and schools

Achieving Excellence

Faculty staff and students are organised into departments and schools, described in the pages that follow.

School of Clinical Dentistry

The School of Clinical Dentistry is one of the top dentistry schools in the UK. We admit over 100 undergraduate students each year to study on our five-year BDS programme or our 27-month Diploma in Dental Hygiene and Dental Therapy. We welcome postgraduate students to a wide range of taught courses and research degrees. We also run the largest widening participation programme in the UK for encouraging young people to enter careers in dentistry.

We achieved an 'excellent' (23/24) rating in the most recent QAA Subject Review exercise and in a recent independent review of teaching we were described as 'an excellent school of international calibre'. The School was ranked No.1 for dentistry in the Independent's Complete University Guide 2010 and our students are amongst the most satisfied in the UK – the 2009 National Student Satisfaction Survey placed us first in the UK for student satisfaction in dentistry. In the recent Research Assessment Exercise, 70 percent of our research was graded as 'world leading' or 'internationally excellent'.

Our students and staff benefit from first-class facilities. The School of Clinical Dentistry and the Charles Clifford Dental Hospital have recently completed a £14.5 million redevelopment, opened in 2008, with state-of-the-art core research facilities, seminar rooms and offices.

We collaborate widely with a number of industrial partners (eg Dentaplex, Ondine Pharma, GSK, Renovo Group plc), and with international universities including San Paulo, Stockholm, Toronto, Yale and Rice (USA).

Life-time achievement awards in dentistry have been awarded to two members of our staff: Professor Richard van Noort and Professor Geoffrey Craig were both awarded the John Tomes Medal of the British Dental Association in 2009.

Our research

The aim of our research is to enhance oral health through improved disease prevention and treatments. To achieve this, our focus is to develop a better understanding of the mechanisms of oral disease and its social context and methods and to translate this understanding to the clinic. We have a strong base of non-clinical scientists and key senior clinical staff. We work closely with industry to encourage knowledge transfer and have developed a network of collaboration with other centres of excellence. This strategy has led to recognition of a number of areas of work as world class or internationally excellent.

Our research is organised into four thematic groups, each involving interdisciplinary research: Oral Biomaterials; Oral Neuroscience; Oral Disease; and Dental Public Health. The key areas of focus of the groups are:

Oral Disease

- Infection and disease
- Oral Cancer

Oral Neuroscience

- Pain mechanisms
- Nerve injury

Oral Biomaterials

- Biocompatibility and tissue engineering
- Custom prostheses for surgery

Dental Public Health

- Oral health and quality of life
- Children's and young people's oral health
- Evaluation of health-care objectives.

Improving people's oral health outcomes is at the heart of our research. Our work has resulted in improved techniques for cost-effective production of stronger denture material, thereby reducing the substantial cost of repairing dentures, and in safer glass and ceramics for use in surgery. In addition we are developing customised maxillofacial prostheses for patients suffering from facial deformities. Our research has shown how to enhance recovery and reduce the pain associated with common trigeminal nerve injuries and laboratory studies have advanced our understanding of mechanisms underlying other types of chronic pain.

Our work on oral cancer has informed Department of Health work on the feasibility of cancer screening. Researchers from the School have prepared the UK National Screening Committee and British Dental Association guidelines on prevention and early detection of oral cancer in primary care. Laboratory research has led to a greater understanding of the cell biology of oral cancer and the role of innate immunity in cancer and oral mucosal diseases.

Our dental public health research is wide-ranging and life-changing. An outstanding example is our research into children and young people's oral health using a combination of clinical and social research strategies to give children an active voice on oral health, to develop a full understanding of the impact of oral health and related conditions on children and their families, and to measure the impact of oral health on children's quality of life.

Our partners

Our research is funded by the major UK research councils and charities including the MRC, BBSRC, EPSRC, Yorkshire Cancer Research and Wellcome Trust, as well as by NIHR and NIH (USA). There is a seamless collaboration between the University and hospital research programmes with a co-ordinated programme of clinical research into oral health. This includes research into community, individual and disease factors with evaluation of diagnostics and outcomes of new interventions (a 'community to clinical' concept).

Across the University, we work with SchARR, Medicine, Chemistry, Chemical and Process Engineering, Molecular Biology and Biotechnology, the Tissue Engineering Research cluster and the Yorkshire Biomaterials Network. Work includes development of new synthetic materials, biosensors to detect infection and the improvement of community dental health.

For more information about our research:
www.sheffield.ac.uk/dentalschool/research

In the recent Research Assessment Exercise

70%

of our research was graded as 'world leading' or 'internationally excellent'

SPOTLIGHT ON

*Professor
Fiona Boissonade*



Chronic pain, including that from the orofacial region, represents a major public health problem, impacting on health, quality of life and the economy. With the lack of reliable treatment, this is an area of high unmet clinical need.

Professor Boissonade's group has a major research interest in the mechanisms of altered neuronal excitability that occur under the pathological conditions of nerve injury and inflammation, and which contribute to the development of chronic pain.

Much of this work has been done at the academic-industrial interface. Professor Boissonade's collaborations with GlaxoSmithKline, Pfizer and Eli Lilly focus on the development of novel analgesics based on the identification of a range of regulators of neuronal excitability. In addition, ongoing projects with Renovo plc are directed towards improvement of nerve regeneration following injury.

School of Health and Related Research (ScHARR)

Regional and global impact

Our approach is to study and evaluate health, healthcare, health services and health policy from the broadest possible range of clinical, economic and social perspectives. We attract more than £6 million per year in external research funding.

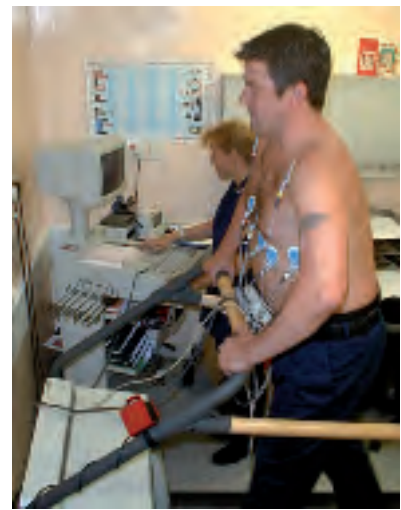
ScHARR brings together health-related expertise in three sections: Health Economics and Decision Science; Health Services Research (HSR); and Public Health. We also house the NIHR Research Design Service for Yorkshire and the Humber, a White Rose collaboration with the Universities of Leeds and York, and the Clinical Trials Research Unit.

ScHARR is one of the eight members of the National NIHR School of Public Health Research. Led by Professor Jon Nicholl, Dean of ScHARR, the new school will deliver a national research strategy to build a strong evidence base for public health practice.

We have 300 multidisciplinary staff from disciplines such as Health Economics, Operational Research, Sociology, Medical Statistics, Nursing, Psychology, and Information Science. There are also clinical skills in Public Health, Emergency and Vascular Medicine, Rehabilitation and Mental Health. Our postgraduate community includes around 90 research students and over 350 masters students.

ScHARR provides an extensive range of continuing professional development courses for NHS staff under the Learning Beyond Registration scheme. These include masters courses in Public Health, Management, Economics, and Informatics.

We are also one of the largest recipients in the UK of funding from the NIHR Health Technology Assessment, Service Delivery Organisation, and Invention for Innovation programmes. We are the largest UK contractor for NICE (National Institute for Health and Clinical Excellence) research, and the major partner in the South Yorkshire Collaboration for Leadership in Applied Health Research and Care (CLAHRC), awarded NIHR funding of £10 million over five years.



Our research

Our research programmes are based on world-class strengths in health economic modelling, decision science, outcome measurement, medical statistics and study design.

Our main research topics are:

Emergency care

Public health trials and research

Assistive Technologies R&D

Psychological services research

Health Technology Appraisals

Methods:

- Decision science focused on cost-effectiveness modelling and the identification, acquisition and synthesis of evidence
- Outcome measurement and evaluation
- Trials methods and statistics.

The main priorities of our empirical health services research are evaluations involving both primary research, especially trials, and secondary research using reviews, evidence syntheses and modelling. Trials are developed and supported through the Clinical Trials Research Unit, which is becoming a pivotal focus for the development of trials within the South Yorkshire research community.

Our research demonstrates a major impact on practice and policy, particularly through our work for NICE, the Department of Health, and other collaborations and consultancy work with the NHS. Our knowledge transfer work with the pharmaceutical and technical device industries is helping us develop new industry-supported CASE studentship opportunities. Across the University we also work with Social Sciences and Science on health-related questions and evaluations.

The 2008 Research Assessment Exercise ranked SchARR as the UK's most powerful department for Health Services Research. The majority of our research was ranked world-leading or internationally excellent.

Our partnerships and collaborations

One of SchARR's highest profile research activities over recent years involves a series of policy evaluations on alcohol pricing and its relation to health (Department of Health) and to crime (Home Office) and the impact of lowering the blood alcohol concentration limit on drink-driving and associated effects (NICE).

In collaboration with Loughborough Business School and the London School of Economics and Political Science, SchARR has been awarded £1 million funding for a project to explore policy interventions to reduce alcohol-related harm. This consolidates and greatly expands an already significant portfolio of alcohol-related research activity.

We are also leading the development of a £1million Centre for Assistive Technology and Digital Healthcare which will be a focus for research into technology for people with disabilities, older people and people with long-term conditions.

Our Department of Health-funded Policy Research Programme Unit in Economic Evaluation in Health and Care Interventions reflects our interest in policy directed research.

Much of our research has international impact, focusing on health services which are not unique to the UK, and conducting trials of international relevance in fields such as rehabilitation, technology evaluation, and public health. At present we have more than fifty international collaborations including academic partners in Australia, Hong Kong and the USA. European research and development projects involve collaboration with universities in Holland, France, Spain, Poland, Lithuania, Czech Republic, Hungary, Romania and Macedonia. SchARR is an active collaborator in the Cochrane Collaboration, Health Technology Assessment International and the WHO Europe Health Evidence Network.

For more information, please go to www.sheffield.ac.uk/scharr

SPOTLIGHT ON

*Professor
Petra Meier*



Risky alcohol consumption causes major medical, social and economic problems both in the UK and worldwide and can have devastating effects on individuals and families.

Professor Petra Meier led a multidisciplinary SchARR team on research for the UK Department of Health that demonstrated that policies which lead to price increases reduce alcohol consumption and can have significant effects on reducing alcohol-related harm.

This was the first study to integrate data on alcohol pricing and purchasing patterns, consumption and harm to answer the question 'What would happen if government were to introduce different alcohol pricing policies?'

Results suggest that policies which increase the price of alcohol can bring significant health and social benefits and lead to considerable financial savings in the health service, criminal justice system and in the workplace. This work has led to a £1 million international collaboration funded by the Medical Research Council (MRC) to explore policy interventions to reduce alcohol-related harm, which aims to drive a step-change in assessment of new and existing alcohol policies, especially in the areas of affordability and licensing.

The UK Government has now introduced plans within its Alcohol Strategy to set a new minimum price per unit of alcohol sold.



“The MAAVIS project, designed within SchARR, gives elderly users easy access to the internet”





Department of Human Communication Sciences (HCS)

Making a difference

The Department of Human Communication Sciences has an international reputation for high-quality research and teaching in human communication and its disorders. With over 350 students on undergraduate, postgraduate, research and diploma programmes, we specialise in the education and training of speech and language therapists and deliver postgraduate courses for a range of professionals working with children and adults with communication difficulties. The Quality Assurance Agency for Higher Education awarded our teaching the highest grade possible in all the assessed categories. The most recent Research Assessment Exercise confirms our status as world-class. We rank as one of the UK's top two HCS research departments.

We house our own speech and language therapy clinic, the Philippa Cottam Communication Clinic, which offers services to adults and children and conducts research in a range of areas, in particular, neurological disorders of communication.

Our research

Our research focuses on theoretical questions about speech, language and communication and the application of research to practice in health and educational settings. Research is funded by

government, research councils and charities.

Research and teaching are conducted in collaboration with the NHS. Our multidisciplinary approach draws on linguistics, phonetics, speech and language pathology, psychology, education, cognitive neuroscience, medicine and computer science.

Research in the department helps improve the speech and language ability of children and adults, and people with acquired brain lesions and developmental disorders. We have produced software programmes that allow people with post-stroke speech impairments to self-administer therapy. Research into the relationship between language and thought has revealed evidence of sophisticated intellectual abilities in people with profound language impairment and has indicated that such individuals should be seen as competent to make decisions about their lives.

Our main research clusters are:

Speech, Language and Literacy: Development, Difficulties and Intervention

This group's research combines theoretical investigations into the nature of spoken and written language difficulties with the application to practice in home, school and clinic settings. Participants include children with speech difficulties including: dyspraxia and stammering; dyslexia; auditory processing difficulties; Down Syndrome; Cleft Palate and associated Syndromes; autism; learning difficulties; and behaviour problems. Studies also include typically developing children, adolescents and

parents from socially disadvantaged backgrounds. Themes in the group include the relationship between spoken and written language difficulties; cross-linguistic issues; spelling and writing development; evaluation of intervention programmes; training school staff and supporting parents; and the spoken and written language skills of young offenders.

Clinical Linguistics

Clinical linguistics plays a key role in the description, analysis and remediation of communication impairment. Our research encompasses various communication impairments, including autism, cleft palate, developmental speech and language disorders and traumatic brain injury. We have developed computer-based technologies to assist speech-impaired people and interactional skills training for teaching assistants and speech and language therapy assistants, who work with children who have speech and language difficulties. We also carry out fundamental research in human communication with a view to its eventual application in clinical and related fields. This includes the study of children's speech development in naturalistic contexts and the cross-linguistic phonetic analysis of naturalistic conversational speech.

Cognitive Neuroscience of Speech and Language

Research within this theme focuses on developing biologically plausible accounts of speech and language processing across the lifespan and in accounting for the behavioural impairments observed following brain injury.

The group has developed new therapies for post-stroke speech disorders and technology to assist speech-impaired people. The relationship between language and other forms of cognition has been explored by examining the capacities of people with severe language impairment to sustain other forms of thinking and reasoning.

Our partnerships

We collaborate with partner universities across the UK and Europe and with a range of universities in the USA and Australia. Within the university, we also work with Computer Science and SchARR on a range of multidisciplinary projects.

For more information see:

www.sheffield.ac.uk/hcs

SPOTLIGHT ON

*Professor
Sara Howard*



Human Communication Sciences

Research carried out by Sara Howard, Professor of Clinical Phonetics, and colleagues in the Department of Human Communication Sciences, is investigating the speech production and speech difficulties of children with a cleft palate.

A recent ESRC Research Fellowship has permitted Professor Howard to explore conversational speech in both typically-developing children and children with speech production difficulties associated with a cleft palate. Using a combination of detailed perceptual and instrumental phonetic analysis, speech production in single words and in longer utterances is compared.

Looking at the phonetics of longer utterances in different languages is also important and current work in the department is exploring speech production associated with cleft palate in a range of languages.

The Medical School

With origins stretching back to 1828, the Medical School is one of the foremost centres for medical education in the UK.

Over 1,500 students study on undergraduate and postgraduate programmes in the Medical School each year. Of these, around 1,300 are undergraduates studying on the Medicine (MBChB) or Orthoptics (BMedSci) programmes. Another 150 are engaged in postgraduate Masters programmes while a further 100 postgraduate research students and over 100 post-doctoral researchers undertake research across the School and its five academic departments.

The Medical School works closely with Sheffield Teaching Hospitals Foundation Trust and associate teaching hospitals across the region to ensure high quality provision for all students. The MBChB and Orthoptics programmes are very highly rated each year by the UK National Student Survey.

Students undertake clinical placements throughout the region and also benefit from an innovative 'Patients as Educators' programme – the largest of its kind in Europe. From the very start of their studies, students have contact with patients who are trained to support learning and provide feedback. All students undertake a research attachment which, for many, leads to them undertaking an intercalated

degree in Medical Sciences, Law or Public Health. The school has particular strengths in assessment practice, design and innovation.

Within the Medical School, the **Academic Unit of Primary Medical Care** provides a well-established multi-disciplinary programme of academic training for community-based clinical staff. A Postgraduate Certificate in Medical Education for newly qualified and established GPs is also offered.

Research is focused on translational research with direct impact on patient care. Current research topics are:

- Shared decision making in the management of long-term conditions (e.g. pre-diabetes mellitus).
- Meeting the health needs of different socioeconomic communities (e.g. referral for cardiovascular disease in deprived communities).
- Management and follow up of breast cancer in the community (e.g. interventions to facilitate discharge from hospital care to general practice and the communication of risks of recurrence to discharged patients).

Further medical research is driven through academic departments, organised around core strengths: Developmental and Biomedical Genetics; Cardiovascular Science; Human Metabolism; Infection and Immunity; Neuroscience; and Oncology.



The Medical School is one of the foremost centres for medical education in the UK.

MRC Centre for Developmental and Biomedical Genetics

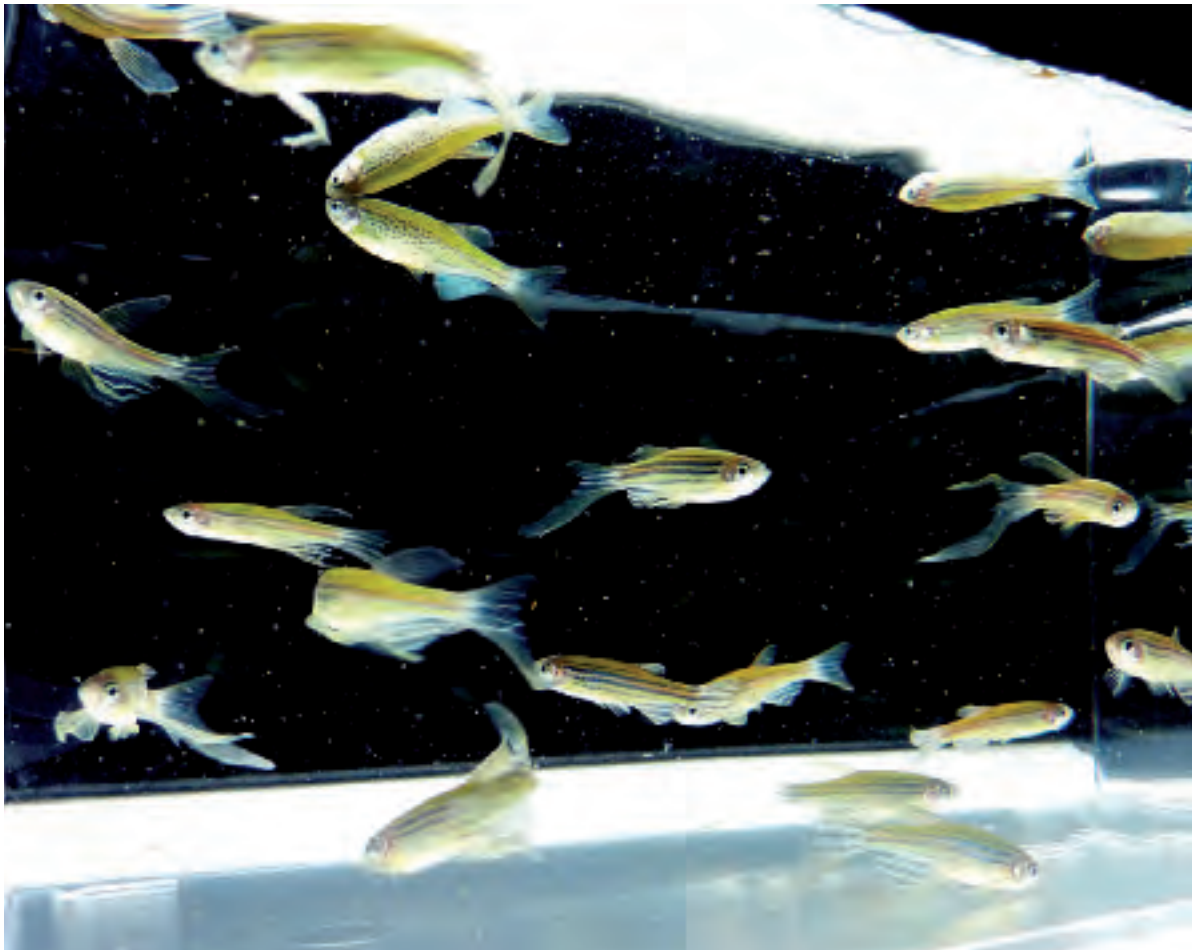
The MRC Centre for Developmental and Biomedical Genetics (CDBG) is a flagship partnership between the Faculties of Science and Medicine, Dentistry and Health. Internationally-recognised as a leading centre for Biomedical research, the CDBG combines expertise from both Faculties to create a unique, critical mass of investigators addressing major health burdens such as chronic inflammatory disease, cancer, dementia and heart disease. Its key strategy is to bring together developmental geneticists with clinician scientists, creating a focus of expertise in the generation of animal models of human disease, with the goal of promoting the translation of findings from model systems to clinical practice through the identification and development of novel therapeutics. Led by Professor Philip Ingham, FRS, the CDBG is a key driving force in the delivery of translational research for both Faculties and boasts some of the finest research facilities in the UK. It currently attracts annual grant income in excess of £2 million.

Non-mammalian model organisms, such as the fruit fly, *Drosophila*, and the tropical zebrafish, *Danio rerio*, have emerged as powerful systems for the *in vivo* analysis of developmental and pathological processes, offering a level of subcellular resolution and genetic manipulation not possible in more traditional mammalian organisms. The CDBG's research is focused on using these organisms to develop novel models of inflammatory, neurodegenerative, cardiovascular, musculo-skeletal disease and cancer.

In conjunction with the MRC, the CDBG offers training and employment to talented individuals who want to pursue a career in the developmental and biomedical sciences. There are more than 100 post-doctoral researchers, PhD students and technical staff currently employed.

Core funding for the CDBG is provided by the Medical Research Council (MRC) while individual research projects are supported by a number of agencies including the BBSRC, British Heart Foundation, Cancer Research UK, Parkinson's UK, The Wellcome Trust and the European Union.

Tropical zebrafish in the MRC Centre for Developmental and Biomedical Genetics



Department of Cardiovascular Science

The Department of Cardiovascular Science performs research into coronary artery disease, pulmonary hypertension and bleeding disorders. Working closely with clinicians, much of our research involves use of patient samples to translate discovery science from basic programmes. The Medical Research Council (MRC) Centre for Developmental and Biomedical Genetics is a key discovery engine in the science of the group.

Our funding sources include the National Institute for Health Research, the Medical Research Council, BBSRC, EPSRC, the European Union and the British Heart Foundation.

Our research

Our research makes demonstrable impact in clinical medicine. Examples include:

- The development of new antiplatelet regimens in coronary artery disease.
- The development of informatics systems for the collection of routine clinical data for research.
- The integration of routine patient follow-up visits into research protocols which have ensured that follow-up occurs in a timely manner.

Our research groups benefit from access to the Clinical Research Facility (CRF), a purpose-built unit which provides a specialist and dedicated environment for the conduct of high-quality clinical research.

“Our work addresses the biggest health challenges facing our country, our health services and our world today.”



Credits : AZ / IS /
S. Kaulitzki, M.
Abildgaard, V.
Yakochuk

Our main research areas are:

Cell biology

Regulation of inflammatory responses, specifically on events related to receptor function and cell signalling.

Coronary artery disease

Biology of coronary artery disease, both its aetiology and mechanism of presentation.

Haemostasis research

Concentration on the biology of unexplained bleeding in patients.

Inflammatory signalling

Molecular and cellular regulatory mechanisms of inflammatory signal transduction networks, with a special focus on vascular cell types.

Medical Physics

Research focuses on modelling and simulation in medicine and the group is a core contributor to the Virtual Physiological Human programme. We are developing predictive tools that will be used to improve clinical diagnosis and interventional planning.

SPOTLIGHT ON

Professor Rob Storey



Professor Storey has worked for eight years in Sheffield on new drugs for reducing the risk of clotting in the heart blood vessels for people who have had a heart attack or a stent inserted.

He has led UK investigations of a new antiplatelet drug, ticagrelor, showing how this has a more consistent effect compared to the standard drug clopidogrel as well as a more rapidly reversible action.

He served on the executive committee of the PLATO study which has shown that ticagrelor can prevent one in five deaths in the year following heart attack compared to clopidogrel, which is an important breakthrough for heart attack victims.

Non-mammalian models

Non-mammalian systems (zebrafish) are used to model biological processes relevant to cardiovascular diseases. We have established models of collateral vessel development and macrophage behaviour.

Platelet Group

The group has a major interest in development and assessment of new antiplatelet agents for use in coronary artery disease.

Pulmonary Vascular Group

This group studies molecular mechanisms underlying pulmonary arterial hypertension (PAH) involving the tumour necrosis factor (TNF) superfamily e.g. osteoprotegerin (OPG, TNFRSF11B), Tumour necrosis factor-Related Apoptosis Inducing Ligand (TRAIL, TNFSF10) and Receptor Activator of Nuclear Factor- κ B Ligand (RANKL, TNFSF11).

Vascular Biology Group

The overall research theme focuses on mechanisms by which leukocytes and platelets are recruited to sites of injury and inflammation in cardiovascular diseases.

Virtual Physiological Human Modelling

The Department and Faculty has embarked on an exciting new venture, with the Faculty of Engineering and Sheffield Teaching Hospitals Foundation Trust to set up an institute known as Insigneo devoted to Virtual Physiological Human modelling. Supported by EU funding, the VPH develops and implements personalised computer models, based on patient data, to predict how individuals will respond to diseases and to evaluate potential treatments.

Our partnerships

International collaborations include our participation in the Zimmerman program on the molecular and clinical biology of VWD (ZPMCB-VWD), with North American collaborators in Milwaukee and Kingston, Ontario. The Platelet Group, led by Professor Robert Storey, was a major contributor to the PLATO study, published in the New England Journal of Medicine, on the effectiveness of the new drug ticagrelor at the time of heart attack. Further work will help to define the ideal treatment for patients with unstable and stable coronary disease.

Department of Human Metabolism

The Department of Human Metabolism, brings together 31 academics across five locations. We include the Mellanby Centre for Bone Research, the World Health Organisation Collaborating Centre for Metabolic Bone Disease and the Sheffield Institute for Foetal and Neonatal Imaging.

Our research

We combine strong basic and clinical science groups to create a major focus on translational research. Research is taking place on a variety of medical conditions of key importance in the UK.

- One in six couples suffer infertility at some point in their lives and now one percent of all UK births are born through the use of assisted reproduction.
- 2.6 million people in the UK are diagnosed with diabetes and providing treatment and dealing with associated complications costs the NHS approximately £1 million per hour.
- One in two women and one in five men above the age of 50 will fracture a bone as a result of osteoporosis.
- Autoimmune thyroid disease affects approximately one percent of the population and is the most common form of organ-specific autoimmunity.
- Care of premature babies costs the NHS almost £1 billion per year more than if they were born full-term.

As a result of our research we hope to improve treatment, reduce NHS costs and improve quality of life for UK citizens across a variety of medical conditions.

State-of-the-art molecular biology laboratories, tissue culture facilities, dedicated clinical research facilities and access to the latest imaging technology including MR, NMR and PET scanning support our research activity.

Our research units

Bone biology

The principal interests are in understanding the normal regulation of skeletal development and homeostasis, how these processes are disturbed in disease and how identifying specific molecules can provide new therapeutic targets.

Bone metabolism

Pathophysiology, diagnosis, screening strategies and treatment of osteoporosis. The unit's work also involves a better understanding of the causes of bone loss around hip prostheses.

Child health

Determining fracture risk through novel imaging of bone architecture in children with both healthy and fragile bones and experimental medicine in the bone and endocrine fields.

Clinical pharmacology

The major interests are in the biochemical pharmacology of drugs and the variability in human drug metabolism with an emphasis on the role of pharmacogenomics in the clinical response to drugs.

Diabetes, endocrinology and metabolism

Investigates the regulation, structure and physiology of hormones and applies this knowledge to the treatment of diabetes and the development of novel treatments for both inherited and acquired endocrine disorders.

Radiology

Performs the majority of its research using magnetic resonance techniques, with particular emphasis on neuro imaging, fetal imaging and the use of hyperpolarised agents.

Reproductive and developmental medicine

Investigating the biology of gametes and embryos, male and female fertility, pregnancy and the molecular basis of human parturition and pre-term birth.

The Mellanby Centre for Bone Research

The Mellanby Centre for Bone Research was opened in June 2009 as an inter disciplinary centre for bone research and draws together principal investigators from Medicine, Biological Sciences and the Centre for Engineering and Materials Science. The centre boasts the Bone Analysis Laboratory which provides researchers with access to contemporary approaches to the analysis of bone and the Bone Biochemistry Laboratory which offers a wide range of measurements of bone turnover markers and

The Department of Human Metabolism brings together

31

academics across five locations

hormones related to bone. The centre is named after Sir Edward Mellanby, a British born physician and pharmacologist whose seminal work led to the discovery of the role of Vitamin D in rickets and who was appointed to the foundation chair of pharmacology at the University of Sheffield in 1920.

Centre for Integrated Research into Musculoskeletal Ageing (CIMA)

CIMA was established in January 2012 with a £2.5m investment by the Medical Research Council and Arthritis Research UK to bring together world renowned researchers to investigate why musculoskeletal tissue function and structure declines with age.

Working with partners at the Universities of Liverpool and Newcastle, our researchers are investigating whether age-related decline in bone density and the degeneration of articular cartilage are due to ageing alone or whether the risk increases with specific diseases. The collaboration across three major universities enables a whole system approach to be pursued, combining complementary expertise, to drive rapid progress in basic and translational research.

Our partnerships

We have project and programme grant support from major funding councils including the Medical Research Council (MRC), the Biotechnology and Biological Sciences Research Council (BBSRC), the National Institute for Health Research and the European Commission as well as funding from charities such as Arthritis UK, Cancer Research UK, Diabetes UK, the Infertility Research Trust and Leukaemia and Lymphoma Research. We also work closely with the pharmaceutical industry, including Amgen UK, AstraZeneca, Roche, Lilly, Warner Chilcott, Unilever, Hologic, and IDS.

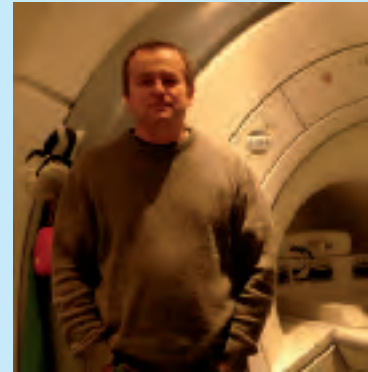
We are involved in international collaborations with Erasmus Medical Centre (Rotterdam), Harvard Medical School (USA), the Mayo Clinic (USA), University of California (USA), University of Kiel (Germany), University of Kuwait (Kuwait), University of Queensland (Australia) and Wright State University (USA). The WHO Collaborating Centre for Osteoporosis is based within the Department and an EU funded COST Action Programme – Maternal Interaction with Gametes and Embryos – currently has 85 academic partners from 23 countries.

For more information see:

www.sheffield.ac.uk/humanmetabolism

SPOTLIGHT ON

Professor Jim Wild



Lung diseases are the fourth biggest killer in the UK. Currently the only way to get medical images of the lungs is to use Xrays and CT scans.

These are fine for looking at the structure of the lungs but have a harmful radiation dose. More to the point, CT tells us very little about how the lung is functioning and so has limited sensitivity to picking up early signs of lung diseases such as cystic fibrosis, asthma and emphysema.

The polarised lung and respiratory imaging group led by Jim Wild has developed novel magnetic resonance imaging technology for imaging the lungs. The group is internationally recognised in this field.

By inhaling small amounts of the inert gases helium-3 and xenon-129, whose signal has been laser boosted or “hyperpolarised” with our custom equipment, we get very high resolution lung images with direct access to the lung’s physiological workface – the small airways. Thus we have sensitivity to pick up early signs of lung disease and changes in physiology and have the potential to treat patients when they can benefit most.



Department of Infection and Immunity

The Department of Infection and Immunity combines clinical and basic science research in molecular cell biology with a particular focus on innate immunity in respiratory medicine, infectious diseases, renal medicine, cancer, rheumatology and dermatology. Our research has a direct impact on people's lives. We are developing a smaller and lighter haemodialysis machine that could save patients three trips a week to hospital by providing treatment which can be more easily carried out in their homes.

We conduct clinical trials of novel meningococcal and influenza vaccines, as well as clinical trials of novel treatments for HIV. We also conduct research to optimise uptake and monitoring of highly active antiretroviral therapy to patients with HIV infection in resource-poor settings. There is access to core facilities in proteomics and genomics, high quality cell biology, containment level 2 and containment level 3 laboratories.

We have a substantial base of Wellcome Trust, MRC and AMRC grant funding. Notably, the department includes one MRC and one Wellcome Trust Senior Clinical Fellow and one Wellcome Intermediate Clinical Fellow. There are also a number of Clinical and Non-Clinical Research Fellows funded by MRC, Wellcome Trust, ARC and Kidney Research UK.



Our research

Research in respiratory medicine is focused on understanding mechanisms of inflammation in the context of lung diseases such as COPD, pulmonary hypertension, asthma, and interstitial lung disease. The University of Sheffield has the largest national centre for pulmonary vascular disease. The Academic Unit of Immunology and Infectious Disease has interests in bacterial pathogenicity and viral infections, and in macrophage responses to bacterial pathogens. Shared interests in the hypoxic regulation of innate immune mechanisms link the work of the Academic Units of Immunology and Infectious Diseases, Rheumatology, and Inflammation and Tumour Targeting. The Academic Unit of Dermatology Research has a major interest in inflammatory skin disorders, eczema and psoriasis. Nephrology research is focused in two main areas: polycystic kidney disease and chronic kidney disease. There is extensive expertise in vertebrate and mammalian models of chronic inflammatory and infectious diseases.

Our partnerships

We have a strong track record of high quality clinical and translational research and close collaborations with major industrial partners like AstraZeneca and GSK. There are strategic links to the MRC Centre for Developmental and Biomedical Genetics, an outstanding international centre for use of non-mammalian (zebrafish) models of human disease.

We host a Specialist Clinical Dermatology MD and Clinical Fellowship Scheme for the Kuwait and Libyan governments and have links to tropical medicine departments in Malawi and other African countries. We have strong links with the Department of Molecular Biology and Biotechnology within the University of Sheffield, working on microbial pathogenesis of major infections such as MRSA and meningococcal meningitis. Professor David Fishwick is Clinical Director of the Centre for Workplace Health, a novel partnership between University of Sheffield, STHT and the national Health and Safety Laboratories. This work covers clinical aspects of occupational asthma, including diagnostic criteria and a scientific focus on the role of biological agents, particularly LPS, in triggering allergic disease.



SPOTLIGHT ON

Dr Stephen Renshaw



The cells of our immune system are powerful allies in the fight against infection, but in the modern world they can cause damage when inappropriately activated.

The resulting inflammation is a key component of many disease processes, and is a major cause of illness and death in the developed world. A particularly important cell type, called neutrophils, has proved difficult to understand because unlike many other cell types they cannot be genetically manipulated.

Dr Renshaw has developed a model system in zebrafish, where neutrophil behaviour can be seen during inflammation inside a living organism. These zebrafish larvae can be genetically manipulated, to help us understand how neutrophils are controlled normally, and how this goes wrong in inflammatory disease.

The small size of these larvae also means that they can be used to look for new drugs that might be used to treat inflammatory diseases, and we are currently looking through large libraries of compounds to try and find ones that might one day help treat our patients.

For more information see:
www.sheffield.ac.uk/medicine/infectionandimmunity

Department of Neuroscience

The Department of Neuroscience comprises multidisciplinary groups from Neurology, Neuropathology and Biological Psychiatry working in both basic and clinical neuroscience.

Our research focus is strongly translational. A new research facility, the Sheffield Institute of Translational Neuroscience (SITraN), was opened by Her Majesty Queen Elizabeth II in 2010. This £18 million state-of-the-art research facility will bring together scientists and medical specialists from around the globe, dedicated to finding the causes and a cure for MND, as well as other degenerative conditions such as Parkinson's, Alzheimer's, spinal muscular atrophy and multiple sclerosis (MS).

Neuroscience is also home to SCANlab, a dedicated neuroimaging laboratory that offers state-of-the-art computing facilities for the analysis of structural and functional MR imaging data. The multidisciplinary research team's overall aim is to determine mechanisms and aetiological factors that lead to psychosis using neuroimaging, neuropsychology and transcranial magnetic stimulation (TMS) in healthy and clinical populations to define key brain processes, how their alteration leads to psychosis and how their modification by treatment may lead to recovery.

Our research activity is funded through a broad portfolio of funding. This includes support from major UK funding organisations such as the Wellcome Trust, Medical Research Council, NIHR, EU and multiple neurological and psychiatric disease-related charities. Substantial funding from biotechnology and pharmaceutical companies supports our translational and clinical research programmes.

Our research

Clinical and non-clinical researchers combine to investigate the pathogenesis of neurodegenerative disease and major psychoses, with the goal of translating novel insights into new therapeutic approaches. Our major areas of research interest are in neurodegenerative diseases (diseases of the motor system, basal ganglia and dementia); neuropsychiatric disorders (psychosis and major affective disorders) and neuroimaging. The neurodegenerative disease group's research portfolio includes genetic, cellular, molecular and clinical research into common disorders including motor neuron diseases, Parkinson's disease, Huntington's disease and the

ageing brain and dementia. The biological psychiatry group has major research programmes investigating auditory function, time perception and processing, social cognition and executive function in health and neuropsychiatric disease.

Research includes studies to delay the onset of symptoms and prolong survival and quality of life of our patients. However, to conquer these diseases we need a more complete understanding of their underlying mechanisms, which we hope to gain through long-term laboratory-based research in our new Sheffield Institute for Translational Neuroscience (SITraN). We take a multidisciplinary approach to our research, encompassing pathological investigation of human tissue, genetics, disease modelling, gene therapy, cellular/molecular biology allowing target identification and drug screening for novel neuroprotective agents.

An important project is our work on novel gene replacement therapy for children with spinal muscular atrophy, to restore survival motor neuron protein to normal levels. This would ease stress on child patients by delivering treatment in a single injection.

Our partnerships

We have strong collaborative links with other neuroscience groups within the University of Sheffield, including the MRC Centre for Developmental and Biomedical Genetics, which has major strengths in developmental neuroscience and in model systems for neurodegenerative disease; the Cognitive Neuroscience and Neuroimaging groups in the Department of Psychology; and with tissue engineering and nanotechnology groups within the Kroto Institute.

For more information see:

www.sheffield.ac.uk/medicine/neuroscience



SPOTLIGHT ON

*Professor
Mimoun Azzouz*



Spinal muscular atrophy (SMA) is one of the most common genetic causes of death in childhood. The disease is currently incurable.

Professor Mimoun Azzouz's research team has demonstrated significant increase in survival in experimental models of SMA.

This key proof-of-principle experiment has prompted Professor Azzouz and his team to progress this strategy towards obtaining a biologic license application to initiate a phase I clinical trial in SMA patients with funding from the MRC and European Research Council.

Department of Oncology

The Department of Oncology is a large department with over 40 academic staff. We have recently been awarded prestigious Cancer Research UK Centre Status, in partnership with Yorkshire Cancer Research, to create the Sheffield Cancer Research Centre. Our strengths lie in our multidisciplinary portfolio of basic, clinical and translational research, all of which are integrated into a coherent programme which is aimed at better predicting, identifying and treating cancer. Research and teaching are undertaken by seven academic units and the department works closely with academic departments across the Faculty and University, notably Biomedical Sciences, the MRC Centre for Developmental and Biomedical Genetics and the Centre for Stem Cell Biology. Sixty percent of cancer research within the Faculty of Medicine was judged as internationally excellent in the most recent Research Assessment Exercise.

Our research

The major research strengths of the Department cover the following areas. Our research has been translated into a number of new treatments for patients with cancer.

Bone oncology research focuses on improving our understanding of the 'bone metastatic niche' and the fundamental interactions between cancer cells, bone cells and stem cells, as well as the clinical development of new bone targeted agents. Recent results from a £6 million international clinical trial (AZURE) have produced potentially practice-changing results in the management of early breast cancer.

Tumour microenvironment research forms a major national focus, with specialised expertise in the use of experimental models for better understanding the nature of the tumour microenvironment, the imaging of the tumour microvasculature and the development of biomarkers for use in clinical trials. Specifically, work focuses on the further development of tumour vascular disrupting agents (VDAs) and is investigating fundamental processes that are associated with tumour angiogenesis (blood vessel development), vascular function and tumour-mediated orchestration of protective anti-tumour immunity.

Genomic instability studies are undertaken within the **Institute for Cancer Studies** which receives core funding from Yorkshire Cancer Research. Current research concentrates on genetic instability

in cancer and the identification of key genes that determine the fate of tumour cells in response to chemo/radio-therapy. Translational research determines the influence of inherited alterations of damage response pathways on cancer risk and outcome, and the consequences of acquired alterations on tumour development and therapy.

The **Human Nutrition Unit** has an international reputation for basic and applied research relevant to understanding the role of nutrients in the prevention of disease and for healthy ageing. The Unit uses cell culture systems, nutritional genomics, dietary assessments and randomised controlled trials to study the role of diet in the prevention of cancers at various sites. Disease-focused and ageing-focused research is complemented by studies into socio-cultural determinants of food choices.

The **Academic Unit of Ophthalmology and Orthoptics** undertakes clinical and laboratory-based research on the cytogenetics and cell biology of uveal melanomas, eye movement, binocular vision and non-accidental injury in infants.

The **Academic Unit of Supportive Care** undertakes clinical trials of pain and other symptoms, needs assessment and service evaluations, narrative methods, methodological development of quality of life instruments, and information services.

Clinical studies in the **Academic Unit of Surgical Oncology** relate to the management of breast cancer in older women and how health-care professionals' communication skills influence patients' decision-making in choosing their breast cancer surgery and the management of breast cancer in older people.

The **Academic Unit of Clinical Oncology** comprises an experienced and flourishing multi disciplinary research team which to date has entered more than 10,000 patients into a broad range of nationally approved clinical trials. The Unit is located in purpose-built facilities in the Cancer Research Centre which hosts the joint Cancer Research UK and Department of Health-funded Experimental Cancer Medicine Centre. This undertakes dose-finding phase I studies through to post-marketing phase IV trials. Major areas of interest include phase III clinical trials, drug development programmes, radiotherapy developments, gestational trophoblastic disease, lung cancer biology and late-effects of treatment.

The **Academic Unit of Urology** is a lead centre for the NIHR Health Technology Assessment programme ProtecT (Prostate testing for cancer and treatment)

study and has a number of national and international collaborations. Research within recent years has also focused upon the biology of bladder cancer and the clinical application of this knowledge. The Unit has developed a track record in the application of artificial intelligence to clinical data. Fuzzy logic-based models are being used to analyse clinical case data and produce accurate predictions of disease outcome. The unit also carries out clinical studies aimed at improving outcomes post-surgery for thyroid and parathyroid neoplasia.

Much of our research translates directly into the clinic, for example our work in:

- Biological importance of RANKL/RANK/OPG signalling and early development of denosumab.
- Sequence-dependent synergy between cytotoxic agents and the bisphosphonate zoledronic acid in vitro, in vivo and in the clinic, with completed randomised phase II trial (ANZAC) with biomarkers endpoint.
- First evaluation of novel bone biomarkers in oncology, resulting in routine inclusion in development of bone targeted treatments and providing powerful prognostic and predictive information in clinical practice.
- First description of the importance of PARP inhibition in BRCA deficient tumours. This has led to a global programme which is focussed on the development of drugs that can inhibit PARP and be used for the treatment of breast, ovarian and other cancers for which DNA repair is an important therapeutic target.

Our partnerships

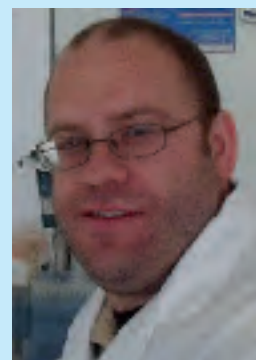
We have major partnerships with Yorkshire Cancer Research, the UK's largest regional medical research charity, Cancer Research UK, the UK's leading cancer charity, the Breast Cancer Campaign, Western Park Hospital, the Department of Health, the Biotechnology and Biological Sciences Research Council and the NHS.

We have flourishing research links with laboratory-based research teams both in Sheffield and beyond, all of which provide opportunities for translational research in bone oncology, biomarker development, lung cancer and immunotherapies. We also have a number of strong national and international links, including the National Cancer Research Institute and the European Organisation for Research and Treatment in Cancer.

For more information please go to www.sheffield.ac.uk/medicine/oncology

SPOTLIGHT ON

Dr. Spencer Collis



Dr Collis was recruited to the Institute for Cancer Studies within the Department of Oncology in October 2009 to establish an independent research programme focusing on DNA repair pathways, which are often dysregulated in cancer.

The work of his lab aims to understand the complex mechanisms of DNA repair pathways in order to expand our knowledge of cancer development and progression. The lab focuses its efforts on the discovery and characterisation of new proteins that are involved in the detection, signalling and subsequent repair of DNA damage.

The lab also aims to determine if mutations in these proteins leads to the development of genetically unstable human diseases such as cancer. It is hoped that this work could eventually lead to the development of new or improved anti-cancer treatments and clinically useful biomarkers.

In September 2010, Dr. Collis was awarded a prestigious CRUK Senior Cancer Research Fellowship worth £1.2 million over the next six years to enable his lab to carry out this work. Additional support for research in the lab is provided by Yorkshire Cancer Research.

School of Nursing and Midwifery

The School of Nursing and Midwifery was established in 1995 and has a reputation for providing high-quality education in support of service and practice development. We offer a wide range of undergraduate and postgraduate programmes in a varied and flexible portfolio. The 2008 Research Assessment Exercise ranked us among the top ten in the UK for research that is world leading.

We are committed to expanding educational opportunities through e-learning and flexible learning as well as traditional face-to-face methods. We pioneered the development of entirely online masters-level education with the Master of Midwifery/MedSci Maternity Care programme launched in 2004 and later joined by its sister programme the MMedSci Advanced Nursing Studies.

We are also a major provider of Continuing Professional Development (CPD) for practitioners, constantly adding to our portfolio of courses. We deliver education and training to approximately 1500 students annually, ranging from local health practitioners who attend individual study days to international students registered on full-time doctoral programmes. As well as offering a wide range of timetabled modules and study days (over 90 different units), we also deliver bespoke and work-based programmes on NHS Trust premises and a growing portfolio of postgraduate courses.



We have a long-standing interest in midwifery practice around the world and have fostered many international links and contacts. The Master of Midwifery/MedSci Maternity Care programme provides opportunities for midwives and other practitioners working with women during childbirth to compare their own experiences with those in different cultural settings and reflect on the implications for perceived best practice. Students from a range of countries have studied on the programme.

Our research

We have key research strengths in: supportive care in later life; children, young people and families; and workforce and practice development. We also have an active Visiting International Student Scheme aimed at international PhD students wishing to gain research experience.

Supportive care in later life

This research theme explores ways in which partnerships can be formed between older people, people with palliative care needs, families and professional carers to generate knowledge that contributes to theoretical understanding and enhanced service delivery. We explore ways to enhance the quality of life of older people and their family carers, and the job satisfaction of caring staff.

Children, young people and families

Obesity and sexual health are major issues for society. This group performs life-enhancing research in understanding identity and arising risks which impact on these society problems. Key issues in the health and wellbeing of children, young people and families are investigated to inform providers of health and social care. The research aims to understand the perspectives of children and young people, and those of adults and other family members, to further the understanding of health-related issues.

Workforce and practice development

Within this theme, we investigate the effect on staff of delivering healthcare, and how new methods of delivery are put into operation. This research informs the UK Department of Health on how their policy initiatives have been implemented and informs professional nursing bodies about issues relevant to their work. The work ensures a nursing and midwifery voice within the growing body of knowledge on healthcare workforce issues.

We deliver education and training to around
1500
students annually

Our partnerships

We work collaboratively with many departments and research centres in the University, and in partnership with health and social care service providers and the independent and voluntary sectors. Dr Penny Curtis is Co-Director of The Centre for the Study of Childhood and Youth and works with the Centre in exploring issues relevant to the health and wellbeing of children and families and disseminating evidence to providers of health and social care. Dr Elaine Whitton is leading a community-based project funded by NHS Yorkshire and the Humber to investigate the induction and preceptorship of newly appointed practice nurses.

Our international links include projects with colleagues in Sweden and Canada, working with older people, their families, practitioners and policy-makers to improve the quality of life for older people and their carers. We also have strong academic links with Norway, Hong Kong, Taiwan and New Zealand.

We work closely with SchARR, and the Academic Unit of Palliative Medicine. Dr Tony Ryan is Principal Investigator on the National Institute for Health Research Collaboration for Leadership in Applied Health and Care Research for South Yorkshire (SY-CLAHRC) Stroke Theme in collaboration with SchARR.

For more information see:
www.sheffield.ac.uk/snm

The 2008 Research Assessment Exercise ranked us among the top ten in the UK for research that is world leading.

SPOTLIGHT ON

Dr Tony Ryan



Stroke is the largest single cause of disability and the third major cause of death in the UK.

The recent National Stroke Strategy has initiated significant work in the development and improvement of acute and community-based services.

There is, however, considerable work to be done in developing the evidence base and assisting the translation of empirical knowledge into practice. Dr Tony Ryan is Lead for the Stroke Theme of the South Yorkshire Collaborations for Leadership in Applied Health and Care Research (SY-CLAHRC).

The theme, one of the largest within the SY-CLAHRC programme, will support South Yorkshire's strategic commissioning of stroke services and the implementation of the National Stroke Strategy in order to reduce the incidence of stroke within South Yorkshire, improve the long-term provision and effectiveness of rehabilitation within the community and improve self management, independence, recreation and employment of people living with the effects of stroke.

Dr Ryan collaborates with a number of key academics from around the Faculty in the development of this work.



Peace gardens,
city centre.

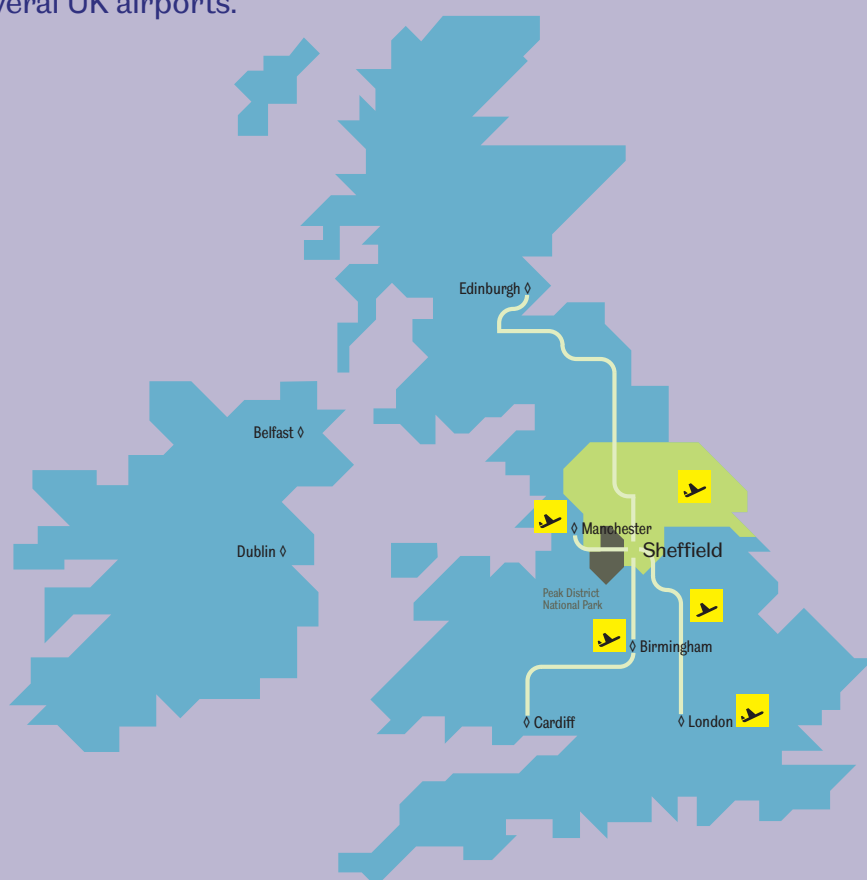


The Peak District
National Park.

About Sheffield

Sheffield is England's fourth-largest city. It has the wealth of facilities you would expect to find in a major city, yet it is compact, friendly and rich in culture. As well as having nationally important theatres, museums, and galleries, we are also home to a vibrant music, art and cinema scene. The Peak District National Park, just a short drive from the city, provides a wealth of outdoor activities in beautiful, natural surroundings. The University plays a major role in the city. We are one of its largest employers and we attract talented academics and students from more than a hundred different countries worldwide.

Sheffield's central location means it is within easy reach of many parts of the UK. The city is well served by national road and rail networks and is within short travelling distance of several UK airports.





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