Wellcome 4ward North Clinical PhD Academy

PhD Supervisor e-brochure
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Welcome to the 4ward North Clinical PhD Academy.

We have received backing from the Wellcome Trust to create 25 places on our clinical PhD programme over the next five years in addition to supporting a far larger number of fellows through applications to the MRC and other funders. This is a fantastic opportunity to launch the research careers of excellent clinicians across all specialties in northern England with the expectation of pulling through to postdoctoral research. We have assembled an array of wonderful supervisors across our four institutions in this booklet where we expect the PhD projects to be developed across sites to harness the very best opportunities. We have also established collaboration with the Francis Crick Institute in London to bring extra cutting-edge opportunities for exciting projects and career development.

Thank you for your interest so far. We look forward to working with you as you plan your career as a clinician and a scientist.

Prof Neil Hanley       Prof Phil Quirke       Prof Chris Newman       Prof Andrew Fisher
Manchester            Leeds               Sheffield               Newcastle
Endocrinology

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Faculty of Biology, Medicine & Health, University of Manchester, Oxford Road, Manchester, M13 9PT.

Research profile and key clinical specialties

My group researches human development in the embryonic and early fetal period allied to stem cell biology (e.g. the first paper below). This is the phase when all organs are put together and consequently my group cuts across virtually every clinical specialty. Even disorders as far removed from the embryo as schizophrenia actually have significant origins in development. Borne out of studies in development on the transcription factor, SOX9, I also contribute to a research programme on organ fibrosis run by Dr Karen Piper Hanley, with whom I share my group (and two children) (e.g. second paper below).

Two key publications


Possible PhD projects

Exploiting a transcriptomic and epigenomic model of human organogenesis to decipher novel causes of clinical developmental disorders.

More information

In Manchester I direct the Fellowship Academy, have had a number of MRC fellows go through the lab and I have served on MRC, Wellcome Trust and NIHR fellowship panels.
Respiratory/Transplantation

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Institute of Cellular Medicine, Faculty of Medical Sciences,
Clinical Academic Office, Medical School, Framlington
Place, Newcastle upon Tyne NE2 4HH

Research profile and key clinical specialties

Principal Investigator in the Regenerative Medicine and Transplantation Group and
Fibrosis and Repair Group, major research groups in the Institute of Cellular Medicine.
My work covers basic, translational and clinical studies into the aetiology, mechanisms,
prognosis and therapeutics of inflammatory and fibrotic diseases across a range of
organs. Major research themes within my own group include COPD, Pulmonary fibrosis,
Lung infections, Cystic Fibrosis and graft injury after lung transplantation. I have a
specific interest in the optimisation of donor organs prior to transplantation.

Roles and Responsibilities

Dean of Clinical Medicine
Honorary Consultant Chest and Transplant Physician, Newcastle Upon Tyne Hospital
NHS Foundation Trust
Academic Director, Institute of Transplantation, Freeman Hospital, Newcastle Upon Tyne.
Deputy Director, NIHR Blood and Transplantation Research Unit
Board of Directors of International Society of Heart and Lung Transplantation 2013-2016
President-elect International Society for Heart and Lung Transplantation 2016-2017

Two key publications

IL-1α released from damaged epithelial cells is sufficient and essential to trigger
inflammatory responses in human lung fibroblasts. Suwara MI, Green NJ, Borthwick LA,
Mann J, Mayer-Barber KD, Barron L, Corris PA, Farrow SN, Wynn TA, Fisher AJ, Mann
DA. Mucosal Immunology. 2014 May; 7(3): 684-93. (22 citations in 14 months)

Free radical generation induces epithelial-to-mesenchymal transition in lung epithelium
via a TGF-β1-dependent mechanism. MR Gorowiec, LA Borthwick, SM Parker, JA Kirby,
citations)

Possible PhD projects

Real time assessment of pulmonary vascular endothelial integrity using novel
imaging probes in human donor lungs during norm thermic ex-vivo perfusion.

More information

I am responsible for oversight of entire clinical academic training Pathway in
Newcastle.
I have previously been or currently am supervisor of 15 MD/PhD students.
Cardiovascular Disease

c.newman@sheffield.ac.uk

Department of Infection, Immunity and Cardiovascular Disease, Faculty of Medicine, Dentistry and Health, University of Sheffield, Medical School, Beech Hill Road, Sheffield, S10 2RX.

Research profile and key clinical specialties

Primary research interest in non-viral gene therapy, especially the use of ultrasound as a delivery technology. Interests in pulmonary hypertension and vascular biology.

Roles and Responsibilities

Faculty Director of Research & Innovation for the Faculty of Medicine, Dentistry & Health Director, NIHR Sheffield Clinical Research Facility Professor of Clinical Cardiology and Honorary Consultant Cardiologist

Two key publications


Ultrasound-mediated delivery of TIMP-3 plasmid DNA into saphenous vein leads to increased lumen size in a porcine interposition graft model. Gene Therapy (2005) 12(14):1154-7

Possible PhD projects

Ultrasound enhanced gene therapy of BMP9 to prevent and reverse experimental pulmonary arterial hypertension in rodent models

More information

Have served on NIHR Doctoral Fellowship Panel and BHF Project Grant Panel. Previous Chair of British Society for Cardiovascular Research and Secretary and Treasurer of British Atherosclerosis Society

Wellcome 4ward North Clinical PhD Academy
Histopathology/Colorectal cancer/ Digital pathology
P.Quirke@leeds.ac.uk

Section of Pathology and Tumour Biology, Leeds Institute of Cancer and Pathology, University of Leeds, Wellcome Trust Brenner Building, St James University Hospital, Leeds, LS9 7TF

Research profile and key clinical specialties
Phil leads the pathology of the NHS Bowel Cancer screening programme as well as being a NIHR Senior investigator, Fellow of the United Kingdom Academy of Medical Sciences and President of the Pathological Society of Great Britain and Ireland. Phil has is best known for his work on the importance of the circumferential resection margin and its relationship to local recurrence and survival, its association with poor surgery and the importance of total mesorectal excision in reducing incomplete excision and improving bowel cancer. Further study of abdominoperineal excisions has highlighted the need for personalised excision margins based on MRI and the need for extralevator APE in some patients. More recent work has highlighted issues with the quality of colon cancer surgery. Phil is involved in over 40 past, current or planned trials including important trials such as MRC Classicc and EME Rolarr investigating laparoscopic and robotic surgery, MRC CR07 demonstrating the importance of the quality of surgery and on molecular studies on stage II and stage IV disease (Quasar, NCRI Foxtrot, MRC Axis, MRC Focus 1-4, etc.) to name just a few.

Two key publications

Possible PhD projects
Single cell analysis of early colorectal neoplasia; towards a better understanding of its development and progression

More information
Digital pathology
http://medhealth.leeds.ac.uk/homepage/544/fmh_research-molecular_and_digital_pathology
Virtual pathology
http://www.virtualpathology.leeds.ac.uk

Wellcome 4ward North Clinical PhD Academy
Immunobiology

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Professor of Immunobiology, Division of Infection, Immunity & Respiratory Medicine, University of Manchester, AV Hill Building, Oxford Road, Manchester. M13 9PT

Research profile and key clinical specialties

The Allen laboratory investigates the host immune response to parasite infection with a particular focus on type 2 immunity, the response mammals characteristically make to large multicellular parasites (helminths). A major research theme of the lab has been to investigate the function of macrophages activated by type 2 cytokines and their role in anti-helminth immunity. Prof Allen’s research interests include the relationship of anti-helminth immunity to wound repair pathways, and understanding the challenges faced by the immune system during co-infection with both micro and macroparasites.

Two key publications

Tara E. Sutherland, Nicola Logan, Dominik Rückerl, Alison A. Humbles, Brigitta Stockinger, Rick M. Maizels & Judith E. Allen. 2014. Chitinase-like proteins promote IL-17-mediated neutrophilia in a trade-off between nematode killing and host damage. Nature Immunology. 15(12):1116-25


Possible PhD projects

Type 2 cytokines as accelerators of wound repair during helminth infection and tissue fibrosis.

More information

All PhD students have completed on time and continued to successful academic posts including 5 Wellcome Trust students. Prof Allen holds a Wellcome Trust Investigator award and programme funding from the MRC.
Cardiovascular and Disease/Diabetes

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Research profile and key clinical specialties

David Beech is Professor of Cardiovascular Science at the University of Leeds, Fellow of the Academy of Medical Sciences (FMedSci) and a Wellcome Trust Investigator. His seminal discoveries span the molecular basis and regulation of calcium channels in a range of cell types of importance in cardiovascular disease and related inflammatory conditions. He has led multiple complex research projects including collaborative partnerships with cardiologists and surgeons. He has demonstrated direct relevance of his discoveries to diseased human tissues. With his outstanding scientific and leadership capabilities in the field of biomedical sciences, David shows continuing upward trajectory with already a large volume of excellent discoveries and innovations.

Two key publications


Possible PhD projects

Mechanical force sensing in abdominal aortic aneurysms

More information

BHF 4 Year PhD programme
“Cardiovascular Disease and Diabetes”
http://www.cardiovascular.leeds.ac.uk/
Ophthalmology

paul.bishop@manchester.ac.uk

Faculty of Biology, Medicine & Health, University of Manchester, Oxford Road, Manchester, M13 9PT.

Research profile and key clinical specialties

I am Professor of Ophthalmology and Matrix Biology at the University of Manchester and an Honorary Consultant Ophthalmologist at Manchester Royal Eye Hospital, Central Manchester University Hospitals NHS Foundation Trust. During my career I have held several fellowships including a Wellcome Trust Senior Research Fellowship in Clinical Science. My laboratory works towards developing new treatments for retinal diseases. We use a combination of genomics, transcriptomics and proteomics to study the molecular basis of age-related macular degeneration. We are developing a glycoprotein we discovered in the eye, called opticin, into an anti-angiogenic therapeutic and we are developing optogenetic approaches to restore vision in the blind.

Two key publications


Possible PhD projects

Investigation into the molecular pathology of age-related macular degeneration

More information

Chair of Academic Sub-Committee and Academic Lead for the Royal College of Ophthalmologists.
Dr Nicoletta Bobola

Craniofacial Biology

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Faculty of Biology, Medical and Health, Division of Dentistry, University of Manchester, Manchester. M13 9PT

Research profile and key clinical specialties

I am Professor in Developmental Biology and Genomics at the University of Manchester. My main research interest is in the role of the non-coding genome in development and disease. The majority of disease-associated loci identified by genome-wide association studies (GWAS) lie in non-coding regions of the genome. Cis-regulatory elements (CREs), blocks of sequences embedded in the relatively uncharted non-coding genome, control the expression of genes. Variations in CREs alter gene expression, disturb development and cause congenital disease, or increase the risk of developing disease in adulthood. My research group uses the latest genomics technologies to delineate the functional non-coding genome instructing formation of the face in humans. We aim to understand the importance of non-coding genetic variants and their contribution to craniofacial malformations.

Two key publications


Possible PhD projects

Defining the role of the non-coding genome in development to improve diagnosis of clinical craniofacial malformations

More information

Supervisor/cosupervisor of 6 PhD students. Advisor to 13 PhD students. Internal and external examiner for 7 doctoral dissertations.
Medical Genetics/Molecular Medicine

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Section of Genetics, Wellcome Trust Brenner Building, University of Leeds, St James’s University Hospital, Leeds, LS9 7TF

Research profile and key clinical specialties

I am the Centenary Professor of Molecular Medicine at the University of Leeds. I am an academic medical geneticist and honorary consultant in clinical genetics at the Leeds Teaching Hospitals. In addition, I am active in implementing new sequencing and genome analytical laboratory methodologies into diagnostic use. I direct the MRC Single-Cell Genomics Centre at St James’s Hospital and I am a Senior Editor of the Journal of Pathology. My areas of research interest are: rare inherited disorders and genetic models; application of genomic technologies to diagnostics; genomic imprinting; bioinformatics; genetic and acquired disorders of fructose metabolism.

Two key publications


Possible PhD projects

An investigation of the role of the *KHDC3L* (C6orf221) gene product in regulating genomic imprinting in the female germline.

More information

Currently co-supervisor to six University of Leeds PhD students.
Professor Julia Brown

Clinical Trials/Medical Statistics

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Professor in Clinical Trials Research, Clinical Trials Research House, 71-75 Clarendon Road, University of Leeds, Leeds, LS2 9PH.

Research profile and key clinical specialties

Julia Brown is Professor of Clinical Trials Research and Director of the Leeds Institute of Clinical Trials Research which incorporates the Clinical Trials Research Unit. The CTRU is NCRI accredited and a UKCRC Registered CTU with a national and international reputation for conducting well designed and executed complex multi-centre clinical trials. A graduate in medical statistics, Professor Brown spent a number of years in the NHS and Industry before joining the CTRU in 1991. Her main research interests are in the design and analysis of complex trials and the development and incorporation and analysis of patient reported outcomes in clinical trials. She is a NIHR Senior Investigator.

Two key publications


Possible PhD projects

Biomarker Guided Adaptive Trial Designs

More information

Chair of NIHR Doctoral Fellowship Panel 2014-2016
Academic lead for Yorkshire and Humber NIHR Research Design Service 2008-2016
Deputy Chair NETSCC HTA Board.

Wellcome 4ward North Clinical PhD Academy
Professor Iain Buchan

Public Health Informatics

buchan@manchester.ac.uk

Health eResearch Centre, Division of Informatics, Imaging and Data Science, Faculty of Biology, Medicine and Health, University of Manchester.

Research profile and key clinical specialties

Iain Buchan is Professor in Public Health Informatics and leads the Centre for Health Informatics at the University of Manchester. He directs the MRC Health eResearch Centre (www.herc.ac.uk) of the UK’s Farr Institute for Health Informatics Research (www.farrinstitute.org) and originated the Connected Health Cities network of learning health systems (www.connectedhealthcities.org). He holds qualifications in clinical medicine, pharmacology, computational statistics, public health and health informatics, and leads a multi-disciplinary team developing and applying health data science methodology. He also writes software (e.g. www.statsdirect.com). Internationally, he is a Fellow of the American College of Medical Informatics and works through WHO, IMIA and other networks towards toward a future of more globally interoperable modelling with large-scale health data - for discovery science, for actionable analytics in health systems, and for citizen-driven healthcare. He applies his methodology to scientific discovery and healthcare innovations in many disease areas including obesity, diabetes, coronary heart disease, chronic kidney disease, cancer and mental health.

Two key publications

Sperrin M, Candlish J, Badrick E, Renehan A, Buchan I. Collider bias is only a Partial Explanation for the Obesity Paradox. Epidemiology 2016 Apr 5. Epub ahead of print


Possible PhD projects

Dynamic risk-stratification of non-elective hospital admission risk from longitudinal analysis of electronic health record data: better timing of drug treatment initiation in type 2 diabetes; supporting medication behaviours through 'self quantification'

More information

Supervised over 10 students through to completion funded by multiple sources including MRC, EPSRC, NIHR and Wellcome.
Two key publications


Possible PhD projects
Cognitive problems and autism spectrum disorder secondary to enhanced PI3-kinase signalling; new insights from the Activated PI3 Kinase Delta Syndrome.
Professor William Deakin

Psychiatry

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Professor of Psychiatry, Neuroscience and Psychiatry Unit, Stopford Building, University of Manchester. M13 9PT.

Research profile and key clinical specialties

Bill Deakin heads Neuroscience Research in the Division of Psychiatry. An important focus of his group is to use modern imaging techniques to directly visualise 5HT and glutamate working in the brain. Patients and volunteers lie in a magnetic resonance imaging scanner and the images show which parts of the brain respond to drugs chosen to probe 5HT or glutamate functioning and how it performs mental tasks. The group can show, for example, that a single dose of an antidepressant drug lights up areas of the brain concerned with anxiety responses and turns off other areas concerned with memory in healthy volunteers. The group can also visualise how these neurotransmitters modify how the brain processes information. For example, viewing the image of a fearful face engaged regions of the brain concerned with emotion; a pre-dose of an antidepressant specifically affects this part of the response while not affecting fear responses in other brain regions. They are now investigating these effects in patients with anxiety, depression and antisocial behaviour. Bill Deakin is the experimental medicine lead of the UK Mental Health Research Network, a NIHR Senior Investigator and a Fellow of the Academy of Medical Sciences. He has over 200 refereed publications and an H-factor of 60.

My current research funding encompasses the role of inappropriate neutrophil activation in COPD and ARDS, the impact of hypoxia on neutrophil function, and the role of PI3K delta in immune cell and airway biology.

Two key publications


Possible PhD projects

Cognitive and pharmacological remediation of anhedonia in addiction and psychosis; a transdiagnostic experimental medicine approach.

More information

Currently sits on grant awarding committees for Wellcome Trust, the Lister Foundation and the EME/NIHR. This enables Bill Deakin to provide excellent training in generic presentational and writing skills and career strategies.

Wellcome 4ward North Clinical PhD Academy
Bone Metabolism

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Department of Oncology and Metabolism, Metabolic Bone Centre, University of Sheffield, Northern General Hospital Sheffield. S5 7AU

Research profile and key clinical specialties

Richard’s research focus is osteoporosis. The University of Sheffield is well regarded for its contribution to the study of osteoporosis. According to Thomson Reuter’s Science Watch, they are ranked fourth among academic centres in the world for citations. He studies epidemiology, pathogenesis, diagnosis and treatment of the disease. This has involved developing and establishing assays for bone turnover markers and studying their clinical utility. He has developed new approaches to the definition of vertebral fracture and applied new approaches such as vertebral fracture assessment. He has developed tools to evaluate bone strength such as high-resolution quantitative computed tomography, ultrasound and finite element modelling of bone strength. He has evaluated the endocrine changes in osteoporosis to better understand its causes. He has designed and conducted clinical trials of nutrition and drugs for the prevention and treatment of osteoporosis and evaluated approaches to enhance compliance with treatment.

Two key publications


Possible PhD projects

The role of circulating bone regulatory factors and microRNA in the pathophysiology of osteoporosis.

More information

Supervision of 2 clinical and 2 non-clinical PhD students Teaches on the CIMA MRES course and provide research projects. Previously member of EME and PSCSB MRC grant boards which allows Richard to provide excellent training in grant writing skills and career advice.

Wellcome 4ward North Clinical PhD Academy
Rheumatology/Arthritis/Musculoskeletal Biomedical Research
p.emery@leeds.ac.uk

Leeds Institute of Rheumatic & Musculoskeletal Medicine,
University of Leeds, Chapel Allerton Hospital, Chapeltown Road, Leeds LS7 4SA

Research profile and key clinical specialties

**Role in Leeds:** Paul Emery is the Arthritis Research UK Professor of Rheumatology, Director of the Leeds Institute of Rheumatic and Musculoskeletal Medicine, University of Leeds and the Director of the Leeds Musculoskeletal Biomedical Research Unit, LTHT.

**International:** Paul Emery was president of EULAR from 2009-2011 and has served on the editorial boards of all the major rheumatology journals. He was inaugural President of ISEMIR (International extremity MRI society). Paul Emery is an NIHR Senior Investigator (2008- ). Paul Emery was a recipient of the Roche Biennial Award for Clinical Rheumatology; the Rheumatology Hospital Doctor of the Year award 1999; and EULAR prize 2002 for outstanding contribution to rheumatology research. 2012 was awarded the Carol Nachman Prize the top international rheumatology prize. He leads the Targeted Ultrasound Initiative (TUI) active in 45 countries.

**GRANTS AND PUBLICATIONS** Paul Emery has been awarded over £46 million in external grants, £19 million as chief investigator. He has written 7 books, 87 chapters, and >1000 peer review publications and has an h-factor of >100.

Two key publications


Possible PhD projects

Preventing autoimmune disease (RA,SLE, SSc). Understanding the pathogenic events underlying the transition from localised to systemic autoimmunity. Precision medicine for immunotherapy.

More information

PhD Project Supervisor for 7 PhD students presently. Supervised 8 PhD students that have been awarded.
Bacterial cell biology, antibiotic discovery, synthetic biology and infectious disease

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Centre for Bacterial Cell Biology, Baddiley-Clark Building, Medical School, University of Newcastle, Richardson Road, Newcastle upon Tyne. NE2 4AX

Research profile and key clinical specialties

Cell division, chromosome segregation, and the control of cell shape are some of the most fundamental problems in biology. The Errington lab uses an array of biochemical, genetic and microscopic methods to study these problems in a range of bacteria, including important pathogens.

We also collaborate with Demuris Ltd, an antibiotic discovery company, in finding inhibitors of some of the essential cell processes we study, which might be turned into novel antibiotics. The compounds we look for are made by actinomycetes, a fascinating group of bacteria that make many of our current antibiotics and other drugs, and have amazing biology and life cycles.

Finally, we study cell wall deficient or "L-form" bacteria and have described the molecular basis for their growth and proliferation. These curious organisms are interesting for three very fundamental reasons. First, they are good models for primordial cells of interest to thinking about the origins of cellular life. Second, they can be used in innovative ways as "chassis" for synthetic biology applications. Third, they are probably important in a range of chronic, persistent or recurrent infections, such as urinary tract infections.

Two key publications


Possible PhD projects

Molecular mechanisms of the L-Form (cell wall deficient) transition in chronic urinary tract infection.
Small molecule effectors made by mycetoma organisms

More information

I have successfully trained 20 (of 21) graduate students to PhD level.
Lab funded by Wellcome Trust and European Research Council.
Microbial pathogenesis, host:pathogen interaction, vaccine development

S.foster@sheffield.ac.uk

The Krebs Institute, Department of Molecular Biology and Biotechnology, University of Sheffield, Sheffield. S10 2TN

Research profile and key clinical specialties

The research in my lab encompasses microbiology from cell structure and biochemistry through to cell growth and division using a range of approaches including super resolution microscopy. This is complemented by an array of studies into host pathogen interaction using several in vivo models. In particular the research focuses on the human, antibiotic resistant, pathogen *Staphylococcus aureus*. This is taken through to translation via our work on vaccine development against *S. aureus* and other pathogens.

Two key publications


Possible PhD projects

The role of the microbiome in the potentiation of *S. aureus* infection.

*S. aureus* infection dynamics

More information

S.foster@sheffield.ac.uk

http://www.floreyinstitute.com/
http://www.imagine-imaginglife.com/
http://krebsinstitute.group.shef.ac.uk/

Wellcome 4ward North Clinical PhD Academy
Professor Richard Grencis

Immunology

Richard.k.grencis@manchester.ac.uk
Faculty of Biology, Medicine and Health, University of Manchester, Manchester, M13 9PT

Research profile and key clinical specialties

Richard’s research interests continue to be centred on immunity to gastrointestinal nematode infections, particularly Trichinella spiralis and Trichuris muris. Current research is focussed on the immunoregulatory mechanisms operating during chronic infection, in terms of suppression of host protective immunity, regulation of pathology and modulation by the parasites themselves. We are investigating cytokine networks, parasite immunomodulatory molecules utilising the extensive transgenic facilities the group have. They are also using quantitative genetics to define genes controlling resistance and susceptibility. We have fostered numerous collaborations both within and outside Manchester including taking a lead on the Trichuris muris genome project with the Sanger Centre.

Two key publications


Possible PhD projects

The consequences of chronic intestinal helminth infection: Extra-intestinal inflammation and liver disease.

More information

Trained over 20 PhD students to successful completion. Supervised joint PhD studentships across facilities. Many of my PhD students/mentored Fellows have gone on to successful academic research positions in their own right or obtained Fellowships.
Paediatrics and Immunology

Sophie.Hambleton@ncl.ac.uk

Institute of Cellular Medicine, Paediatric Immunodeficiency Group, Institute of Cellular Medicine, Newcastle upon Tyne.NE2 4HH

Research profile and key clinical specialties
I trained in clinical paediatrics and in basic immunology, with a focus on inborn errors of the immune system. Since 2008, I have been a consultant on the immunology and infectious diseases team at the Great North Children's Hospital (GNCH). I lead a research team at Newcastle University working to discover the genetic causes of immunodeficiency in our patients. I am passionately committed to making research work for patients at GNCH. I am active within the primary immunodeficiency community both nationally and internationally. I am a member of the UKPIN Genomics Steering Group and the MRC Infection and Immunity Board.

My Research - Primary immunodeficiencies (PIDs) represent a rich resource for hypothesis-generating research on the human immune system. My aim is to elucidate disease mechanism in novel inherited disorders of cellular immunity. My group studies well-characterised patients presenting in childhood with otherwise unexplained susceptibility to intracellular pathogens and/or immune dysregulation. A variety of methods are used to identify candidate disease-causing gene variants, including whole exome sequencing and homozygosity mapping. Selected variants are taken forward for biochemical and functional validation by tailored analyses of biobanked material. In recent years we have identified novel defects of T cells, antigen-presenting cells and innate antiviral immunity that have each contributed important mechanistic insights into human immunobiology.

Two key publications


Possible PhD projects
An exploration of Pathomechanism in two novel Mendelian disorders of immune regulation.

More information
Welcomes both basic scientist and clinicians into research group at all levels.
Wellcome Trust Senior Research Fellow in Clinical Science

m.a.haniffa@ncl.ac.uk

Institute of Cellular Medicine, Medical School, Newcastle University, Newcastle upon Tyne. NE2 4HH

Research profile and key clinical specialties
Professor Muzlifah Haniffa is a dermatologist with a research interest in immunology. Her research programme is focused on understanding the functional heterogeneity of human mononuclear phagocytes, a family of white blood cells comprising dendritic cells, monocytes and macrophages, which initiate and regulate immune responses. She has used functional genomics and comparative biology to align the human and mouse mononuclear phagocyte networks. Muzlifah’s research goal is to understand how mononuclear phagocytes regulate tissue homeostasis, immunity upon vaccination and their role in disease pathogenesis. This knowledge is essential for the development of new strategies to manipulate host immune response to improve vaccination and immunotherapeutic strategies.

Muzlifah was a previous recipient of a Wellcome Trust Intermediate Clinical Fellowship (2010-2015) and an Action Medical Research Training Fellowship (2005-2008). Her work has been recognised by a number of awards including the Lister Institute Research Prize (2016). Muzlifah is an adjunct investigator at Singapore Immunology Network and Institute of Medical Biology, A*STAR, Singapore. She leads a Wellcome Trust funded public engagement programme called Inside Skin, an interdisciplinary dialogue between science and art relating to skin and the immune system in collaboration with the Newcastle Centre for the Literary Arts and Culture Lab.

Two key publications


Possible PhD projects
Reconstructing an unbiased multi-dimensional atlas of the human skin.

More information
I am the lead supervisor for two PhD students. Co-supervised two Wellcome Trust Clinical Research training fellows

Wellcome 4ward North Clinical PhD Academy
Professor Simon Heller

Diabetes

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University of Sheffield, School of Medicine, Sheffield.
S10 2RX

Research profile and key clinical specialties

My role as academic supervisor for the ACFs and clinical lecturers in Diabetes/Endocrinology in the South Yorkshire region for the last 9 years includes membership of the Clinical Academic Working Group for South Yorkshire. My current research interests include the pathophysiological responses to hypoglycaemia and hypoglycaemia unawareness, the potential contribution and mechanisms of hypoglycaemia to cardiovascular mortality, the use of insulin analogues and other technologies to reduce hypoglycaemia. I also lead research programmes concerned with developing interventions (including the DAFNE intervention) to encourage more effective diabetes self-management.

Two key publications


Possible PhD projects

Exploring the potential of beta-blockers and other agents to block the inflammatory and arrhythmic effects of insulin induced hypoglycaemia.

More information

Has supervised 10 MD/PhD students.

Wellcome 4ward North Clinical PhD Academy
Neurogenetics

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Institute of Human Genetics, School of Clinical Medical Sciences, Newcastle upon Tyne. NE1 3BZ

**Research profile and key clinical specialties**

I started my research career in 1995 on the clinical characterisation of mitochondrial diseases. In 2000-2007 my research was based on a diagnostic service in Munich, and I focused on identifying the primary cause in patients with different types of mitochondrial disease. I defined the phenotype, genetic cause and basic disease mechanisms of several severe childhood onset mitochondrial diseases due to mitochondrial translation defects, which has become my research area more recently. We study the reasons behind tissue specificity of mitochondrial diseases and focus on neuronal cell types and zebrafish models of mitochondrial respiratory chain deficiencies with the aim of developing therapy for patients with mitochondrial disease.

As a clinician, I developed a new clinical service in Newcastle for patients with inherited peripheral neuropathies (Charcot-Marie-Tooth disease, CMT). The better characterisation of the clinical phenotypes and the improvement of next generation sequencing techniques resulted in a genetic diagnosis in a much higher number of patients. Current research projects in my laboratory include exploring novel molecular targets in mitochondrial protein synthesis to develop treatments in mitochondrial disease” funded by the Wellcome Trust Investigator Award (109915/Z/15/Z); “Reversibility and tissue specificity of mitochondrial translation defects in early childhood”

**Two key publications**


**Possible PhD projects**

Exploring novel molecular targets in mitochondrial protein synthesis to develop treatments in mitochondrial disease.

**More information**

Since first academic position in 2007 has supervised 10 PhD students.

Wellcome 4ward North Clinical PhD Academy
Professor Tracy Hussell

Inflammatory Disease

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Director, Manchester Collaborative Centre for Inflammation Research, Inflammation and Repair, University of Manchester, 2 Floor, Core Technology Facility, Oxford Road, Manchester. M13 9NT

Research profile and key clinical specialties

Professor Tracy Hussell is a mucosal immunologist specialising in respiratory medicine. During her PhD at University College London she identified Helicobacter pylori as an aetiological agent in human gut lymphomas, which was published in the Lancet. Since 1994 she has studied the molecular pathways that maintain health in the respiratory tract and how these are perturbed in acute and chronic disease including COPD, asthma and post viral infection. She spent 19 years at Imperial College London before being recruited to direct the Manchester Collaborative Centre for Inflammation Research (MCCIR) and to date has 106 publications. It is in this vibrant centre of 86 investigators that she has launched the careers of clinical and basic science research fellows. The MCCIR has close translational collaborations with the University Hospital of South Manchester, Manchester Royal Infirmary and Salford Royal.

Two key publications


Possible PhD projects

Macrophage training in the paediatric, adult and inflamed lung.

Basal stem cell repair of the epithelial barrier.

More information

Have supervised >25PhD students, with 100 % submission rate. This includes clinical PhD students specialising in paediatrics, anaesthesiologist and respiratory

Wellcome 4ward North Clinical PhD Academy
Professor John Isaacs

Clinical Rheumatology

john.isaacs@newcastle.ac.uk

Institute of Cellular Medicine
Newcastle University, Newcastle upon Tyne.

Research profile and key clinical specialties.

My team’s work is focussed in three major areas:
1. The development and testing of novel immunotherapies for rheumatoid arthritis (RA), with a particular interest in therapeutic tolerance induction.
2. The immunopathogenesis of RA, including
3. RA biomarkers – of diagnosis, prognosis and therapeutic response

Major current projects include:
a. development of an autologous tolerogenic dendritic cell therapy for RA and inflammatory arthritis (AuToDeCRA), in partnership with Dr Catharien Hilkens
b. a study of RA patients who are flaring following a period of clinical remission (BIO-FLARE). Funded by the 2016 MRC Experimental Medicine Challenge call.
c. Chief investigator of the MRC-ABPI RA-MAP consortium. A systems biology approach to understanding immune dysregulation in early RA.

Therapeutic tolerance induction remains a ‘holy grail’ for human autoimmunity. A major limitation is a lack of understanding of the immune dysregulation inherent in diseases such as RA, and consequent lack of ‘tolerance biomarkers’, that are required to monitor attempts at therapeutic tolerance induction. Much of our work is focused on these issues – both developing novel tolerogenic therapies but also developing better tools for analysing their efficacy – which cannot be based on traditional biomarkers of inflammation and joint damage. Other recently completed work from our group has identified a potential transcriptional biomarker for the early diagnosis of seronegative RA. That work implicates interleukin-6 and downstream STAT-3 signalling in the early stages of clinical disease, suggesting potential therapeutic targets.

Two key publications

Anderson AE, et al. IL-6-driven STAT signalling in circulating CD4+ lymphocytes is a marker for early anticitrullinated peptide antibody-negative rheumatoid arthritis. Ann Rheum Dis 2016;75:466-73

Possible PhD projects

Understanding the pharmacodynamics of methotrexate therapy in rheumatoid arthritis.

More information

Currently primary supervisor to 4 clinical research fellows. (2 x Wellcome Trust, 1 MRC, 1 NIHR ACF).
Colorectal Surgery

d.g.jayne@leeds.ac.uk

Department of Surgery, St James's University Hospital, Leeds. LS9 7TF

Research profile and key clinical specialties
David Jayne is Professor of Surgery at the University of Leeds and consultant general surgeon at St. James's University Hospital, Leeds. His clinical interests include laparoscopic and minimal access surgery with the application of fluorescent image guided technologies for stratified cancer surgery. His research portfolio includes close collaborations with the physical sciences to develop novel engineering and nanotechnology solutions to facilitate cancer surgery. In 2012 he was awarded an NIHR Research Professorship to facilitate the translation of new technologies into clinical practice. This compliments his role as Clinical Director for the NIHR Healthcare Co-operative in Colorectal Therapies, developing a national network of clinicians, academics, industry partners, and patient and public representatives to develop new solutions to unmet clinical need. He is Chief Investigator for 5 NIHR portfolio clinical trials, including the pan-World ROLARR trial evaluating robotic rectal cancer surgery. He is passionate about applying the knowledge gained from basic and translational research to develop more effective treatments for patients suffering from colorectal disease.

Two key publications


Possible PhD projects
The development and early clinical translation of fluorescent molecular probes for image-guided surgery.

More information
Deputy academic training programme director for Y&H academic surgical careers programme.
Medical & Molecular Genetics

c.johnson@leeds.ac.uk

Leeds Institute of Biomedical & Clinical Sciences, Wellcome Trust Brenner Building, University of Leeds, Leeds. LS9 7TF

Research profile and key clinical specialties

My team works on gene discovery and functional characterization of autosomal recessive inherited disorders such as myopathies, neuromuscular and neurodevelopmental conditions, with a particular interest in ciliopathies. These disorders are a major cause of childhood morbidity and mortality, and there is an essential need to improve their diagnosis and clinical management. Our research aims to gain new insights into the molecular mechanisms of early embryogenesis, neurodevelopment and disease processes. These insights may enable the development of new treatments for patients with rare recessive disorders that modify disease progression or their long-term outlook. Current research, funded by the Medical Research Council and British Heart Foundation, focuses on the genetics and molecular cell biology of ciliopathies and congenital heart anomalies. We use advanced techniques in molecular genetics, functional genomics and systems biology, and imaging methods such as high content imaging and super resolution microscopy. I have successfully supervised 21 PhD students, including five clinical research fellows.

Two key publications


Possible PhD projects

Gene discovery and functional characterization of novel inherited myopathies and neuromuscular and congenital heart anomalies.

More information

An active PhD supervisor for 13 years. All of the PhD students and clinical research fellows that he has appointed and trained over the years have achieved success in biomedical research.
NIHR Dean for Faculty Trainees

David.Jones@ncl.ac.uk

Institute of Cellular Medicine, Medical School, Newcastle upon Tyne. NE2 4HH

Research profile and key clinical specialties

David Jones is Professor of Liver Immunology at Newcastle University and the PI for the UK-PBC Research Consortium developing stratified therapies in autoimmune liver disease. His work has led to the first stratified therapy to reach practice in rare liver disease. He also has an interest in the quality of life of patients with autoimmune liver disease and the mechanisms underpinning key symptoms. This work has led to novel therapies. He is an Honorary Consultant Hepatologist in the Newcastle-upon-Tyne Hospitals NHS Foundation Trust. Professor Jones is also NIHR Dean for Faculty Trainees, assisting NIHR and universities in the leadership training and career management of all trainees funded through NIHR Integrated Academic Training Schemes and NIHR Personal Awards Schemes.

Two key publications


Possible PhD projects

2) "Suicide pact not murder". The role played by target cells in driving their own injury in autoimmunity

More information

Directed 1 of the 4 national Wellcome Trust Translational Medicine and Therapeutics Clinical PhD Programmes.
Cardiovascular and Diabetes Research

m.t.kearney@leeds.ac.uk

Leeds Institute of Cardiovascular and Metabolic Medicine, Division of Cardiovascular and Diabetes Research, Leeds Institute of Genetics, University of Leeds, Leeds.

Research profile and key clinical specialties
Mark’s laboratory is exploring the mechanistic link between endothelial function and insulin resistance. He aims to develop new treatments for people with diabetes, as well as improve our understanding of the link between diabetes and heart disease. Mark leads the Endothelial Cell Biology and Diabetes Group, within the Leeds Multidisciplinary Cardiovascular Research Centre, investigating molecular mechanisms and endothelial cell function such as vascular physiology, insulin-sensitivity, diet, exercise and diabetes. Recent discoveries made by the group include: IGF-1 regulation of endothelial repair and progenitor cell development; VEGF-A isoform-mediated regulation of endothelial signal transduction, gene expression and inflammation; exercise interval training to improve arterial stiffness and heart rate dynamics; FGF-regulated signal transduction in human disease; the role of the TRPM2 ion channel in controlling vascular physiology and diabetes; the effect of flavonoids, polyphenols and diet on metabolism and diabetes.

Two key publications


Possible PhD projects
Examining the mechanisms underlying the favourable effects of vitamin D on left ventricular remodelling in patients with chronic heart failure secondary to left ventricular systolic dysfunction.

More information
On the BHF Fellowship Committee and the editorial boards of the journals Diabetes and Heart.
Mechanistic Biology

j.e.ladbury@leeds.ac.uk

School of Molecular and Cellular Biology, University of Leeds, Room 7.07, Miall Building, Leeds. LS2 9JT

Research profile and key clinical specialties
Our research focuses on the pathogenic outcomes from aberrant signalling which is initiated at receptor tyrosine kinases (RTKs). Most recently we have focused on the previously under investigated recruitment and activation of proteins via binding to proline-rich binding sites on the receptors. These interactions can occur in the absence of receptor stimulation or up-regulation through genetic mutation. Thus these interactions occur in conditions which are experienced by cells in normal tissue. As a result a potentially unexplored landscape of signal transduction which occurs in the absence of exposing cells to high concentrations of growth factors exists.

The majority of RTKs have proline-rich motifs which provide sites for downstream effector molecules. For example, phospholipase Cγ1 binds to FGFR2 through its SH3 domain resulting in activation leading to increase metastatic and proliferative potential of cells. We are screening other RTK proline-rich motifs for binding to downstream effector molecules and exploring novel routes to oncogenesis based on protein concentration fluctuations rather than genetic mutation, i.e. cancer of non-genetic origin.

Two key publications


Possible PhD projects
Investigation of the role of the Argonaute2 protein in mediating oncogenic signalling in non-stimulated cells.

More information
Currently supervises a PhD student on the Wellcome Trust 4-year PhD Programme entitled “The Molecular Basis of Biological Mechanisms” awarded to the Astbury Centre.

Wellcome 4ward North Clinical PhD Academy
Two key publications


Possible PhD projects

Combining advanced neuropsychology, structural and functional neuroimaging to generate a predictive model of post-stroke aphasia patterns and recovery.

Research profile and key clinical specialties

Our research makes use of four key methodologies: neuropsychology, computational models (models that can mimic neural organisation in their construction but also produce target behaviours), transcranial magnetic stimulation (TMS), structural and functional neuroimaging. The various research projects can be summarised under three themes: (1) **Semantic memory**: various interlinked projects explore the nature and neural underpinnings of semantic memory or conceptual knowledge, including category-specific disorders.

(2) **Language**: there are several ongoing projects exploring different aspects of language production and comprehension, and their neural bases. For neuropsychology, these include a direct comparison of fluent and non-fluent varieties of progressive and non-progressive aphasia; acquired dyslexias and dysgraphias; verb morphology deficits; and verbal short-term memory deficits.

(3) **Recovery, rehabilitation and neuroplasticity**: As well as concentrating on the nature of chronic and progressive cognitive and language deficits, the third theme is devoted to the study of the neural and cognitive principles that guide recovery and rehabilitation.

More information

Research Unit NARU: http://sites.psych-sci.manchester.ac.uk/naru/
Inflammation in Cancer

Claire.lewis@sheffield.ac.uk

Department of Oncology & Metabolism, Medical School, University of Sheffield, Beech Hill Road, Sheffield. S10 2RX.

Research profile and key clinical specialties
Microenvironmental signals in tumours controlling the tumour-promoting functions of macrophages

After completing her DPhil (PhD) in Oxford in 1986, Claire held two postdoctoral positions and a Research Lectureship in the Medical School there before joining the University of Sheffield Medical School in 1996. She currently holds a Personal Chair in Molecular & Cellular Pathology and heads a team of pre- and postdoctoral scientists in the Academic Unit of Inflammation and Tumour Targeting.

Claire’s research is focussed mainly on the role of white blood cells called macrophages in both tumour progression and tumour responses to conventional anti-cancer treatments like chemotherapy and irradiation. Her team have also developed novel ways of using these cells to target large amounts of therapeutic virus specifically to prostate tumours. This work has been reported in the UK national press (eg. The BBC, The Guardian, The Daily Mail). Claire also works collaboratively to exploit a novel zebrafish model to investigate the role of macrophages in angiogenesis, tumour progression and response to therapy. Her group is currently funded by grants from the EU, Cancer Research UK, Yorkshire Cancer Research and the Breast Cancer Now. She is a member of the editorial board of several journals, including Blood, the Journal of Clinical Investigation and the International Journal of Cancer.

Two key publications


Possible PhD projects
Role of perivascular tumour macrophages in limiting the efficacy of immunotherapy in breast cancer patients.

More information
Previously supervised 24 PhD students, including a number of clinical research fellows (with 100% success rate)
Hepatology, Molecular Cell Biologist

Derek.Mann@newcastle.ac.uk

Liver Group, Institute of Cellular Medicine, Newcastle University, Newcastle upon Tyne. NE2 4HH

Research profile and key clinical specialties
I am responsible for providing scientific leadership and delivering high impact research into mechanisms responsible for the development of liver inflammation, fibrosis and cancer. A secondary responsibility is to translate this research into therapeutics for chronic liver disease. One of my roles at Newcastle as a Co-director of the Institute of Cellular Medicine is to provide scientific leadership and vision for the 80+ principle investigators within the institute.

I am the head of the Fibrosis Laboratory Research Group and provide the strategic direction and leadership to senior clinical and basic science academics focused on developing translational solutions to tissue remodelling and scar formation in the liver, lung, kidneys, heart and skin. My research group in Newcastle are primarily interested in understanding the molecular basis for tissue fibrosis (scarring) and developing therapeutic strategies for the treatment of fibrotic diseases. Emphasis is placed on signalling pathways in myofibroblasts such as the NF-κB system that can be manipulated with drugs already proved to be safe for use in man. This strategy led to the discovery that NF-κB inhibitors such as sulphasalazine and angiotensin II receptor blockers promote reversion of fibrosis in chronic liver disease.

Two key publications


Possible PhD projects
Discovering plasma DNA methylation biomarkers for minimal-invasive diagnosis and stratification of tissue fibrosis in age-related chronic disease.

More information
Currently supervising two clinical fellows and 6 scientist in their PhD Studies. I have extensive experience of supervision of PhD candidates through to successful completion.
Research profile and key clinical specialties
Over the last decade, we have made great strides into understanding the biology of melanoma. The BRAF gene is mutated in about half of melanoma cases, and the NRAS gene is mutated in about 20% of cases. These proteins are part of a conserved signalling pathway that regulates cell proliferation and survival, and the mutant proteins drive uncontrolled cell growth and tumour progression.

Our laboratory focuses on melanoma biology and we use a combination of approaches, including biochemistry, cell and molecular biology, structural biology, transgenic models and next generation signalling. Following the discovery in 2002 that BRAF is mutated in melanoma we validated BRAF as a therapeutic target and demonstrated that it is an oncogene that can transform immortalised melanocytes. We further demonstrated that oncogenic BRAF could be a founder mutation in melanomagenesis, but that it was not enough by itself and that other genetic events were required. We demonstrated a complex relationship between RAS/RAF and cAMP signalling in melanoma cells and demonstrated that cGMP regulates BRAF mutant melanoma cell migration. A key aim is to translate our basic research findings into patient benefit.

Two key publications


Possible PhD projects
Epidemiology-to-genotype analysis for prevention of human melanoma.

More information
As director of the CRUK Manchester Institute I oversee the CRUK studentship programme within the institute.
Professor Walter Marcotti

Sensory Neuroscience

w.marcotti@sheffield.ac.uk

Department of Biomedical Science, University of Sheffield, Western Bank, Sheffield. S10 2TN

Research profile and key clinical specialties
The main task of auditory sensory hair cells is to convert sound information into an electrical signal that can be transmitted to the brain. This is an extremely demanding task considering that information encoded in sound (e.g. frequency and intensity) has to be processed with temporal precision. Hair cells are named after the hair-like elements called stereocilia that project from their surface. Sound-induced vibration of stereocilia initiates the conversion of sound into an electrical signal, which is generated by the movement of inorganic ions through channels in the stereociliar membrane. This signal induces the release of chemicals at specialised junctions (synapses) that activate auditory nerve fibres in order to relay the information to the brain. Inner ear development is an intricate process involving specific physiological and morphological changes that occur over “critical periods” of development. The proposed project will provide an understanding of key biological processes that underlie cochlear function and development. Moreover, the work pursued in my laboratory is aimed to find the relevant determinants involved in hearing loss in humans. An understanding of mammalian cochlear function and maturation is vital to support research aimed to define the causes of hearing loss and the development of a cure. Gene and stem cell therapies are currently being explored for potential regenerative therapies.

Two key publications

Furness et al., Marcotti W (2013). Progressive hearing loss and gradual deterioration of sensory hair bundles in the ears of mice lacking the actin-binding protein Eps8L2. PNAS 110:13898-903

Possible PhD projects
Molecular and physiological basis of progressive hearing loss.

More information
I have a PhD studentship from Action on Hearing Loss. Plus training two other PhD students.
Human Nutrition

john.mathers@ncl.ac.uk

Human Nutrition Research Centre, Institute of Cellular Medicine, Newcastle University Campus for Ageing and Vitality, Newcastle upon Tyne. NE4 5PL

Research profile and key clinical specialties

Principle Investigator for a portfolio of research projects in the areas of nutrition and the prevention of common non-transmissible diseases including colon cancer and cardiovascular disease. This work includes studies on the biological basis of ageing and ranges from molecular and cell biological studies, through investigations in human volunteers to nutritional epidemiology and large-scale intervention studies.

He has a particular interest in diet: gene interactions. His current work includes the application of post-genomic technologies to develop novel biomarkers of bowel cancer risk which are modifiable by dietary factors. His team is focussing on the role of folate supply in utero and throughout post-natal life in determining patterns of DNA methylation and gene expression.

Two key publications


Possible PhD projects

Biomarkers of obesity-related cancer risk in the colorectal epithelium.

More information

Currently the main supervisor for 5 PhD students and co-supervisor for 2 additional PhD students.

Wellcome 4ward North Clinical PhD Academy
Professor Eva Morris

Cancer Epidemiology

e.morris@leeds.ac.uk

Institute of Cancer and Pathology, Epidemiology & Biostatistics, University of Leeds, St James’s University Hospital, Leeds. LS9 7TF

Research profile and key clinical specialties

I am Professor of Cancer Epidemiology and I lead the Cancer Epidemiology Group within the Institute of Cancer and Pathology. My research centres on the epidemiology of colorectal cancer and its management. I undertake large-scale population-based studies, often involving the linkage and exploration of routine NHS datasets that seek to quantify variation in the processes of management and outcome of cancer patients. This is done in an effort to generate the evidence needed to inform NHS cancer services.

Two key publications


Possible PhD projects

The impact of comorbidity on the management and outcomes of colorectal cancer.

More information

Co-applicant on a Yorkshire Cancer Research Programme entitled “Capacity building tomorrow’s leaders in cancer research to improve outcomes for cancer patients in Yorkshire”

Wellcome 4ward North Clinical PhD Academy
Two key publications


Possible PhD projects

Deconvolution of primary melanoma transcriptomics/copy number data to define biological subsets having prognostic and predictive relevance.

More information

PI on a Marie Curie Training Network. 17 students are being trained across Europe and we are training 4 in Leeds.
**Professor Nancy Papalopulu**

**Wellcome Trust Senior Research Fellow, FMedSci**

nancy.papalopulu@manchester.ac.uk

Faculty of Biological, Medical and Health Sciences, 
University of Manchester, Michael Smith Building, Oxford Road.

**Research profile and key clinical specialties**

During development, cells transition from a proliferating progenitor to a differentiated state or to a dormant one (quiescence) from which they may be reactivated. Understanding how such cell state transitions are regulated is key in understanding how tissues are built in development, maintained in the adult, repaired or subverted to disease, particularly cancer.

My lab’s working hypothesis is that cell state transitions are not simply driven by genes being turned on (or off) as cells make transitions, but by a change in the dynamics of gene expression, for example, from fluctuating or oscillatory (pulsatile) expression to a more stable one. We use state of the art single cell approaches, with absolute quantitation of interacting molecules, live imaging, multiple experimental model systems (neural stem cells from mouse, human, zebrafish) and mathematical modeling, in order to understand how changes in gene expression dynamics underlie cell state transitions. We focus on vertebrate neurogenesis and we aim to apply the emerging concepts, particularly the entry to and exit from quiescence, to cancer and regeneration.

**Two key publications**


Sabherwal, N., Thuret, R., Lea R., and Papalopulu, N. (2014). Phosphorylation of a cell cycle inhibitor, p27Xic1, by a polarity kinase, aPKC, provides a direct mechanistic link between apicobasal polarization and control of the cell cycle, Dev Cell, 8(5): 559-71

**Possible PhD projects**

Understanding how the dynamics of gene expression actively maintain quiescence in Cancer Stem Cells.

**More information**

I am committed to developing young people’s career and most PhD students graduated from my lab have 1st author publications.

Wellcome 4ward North Clinical PhD Academy
Experimental Cancer Medicine

Ruth.plummer@newcastle.ac.uk

Northern Institute for Cancer Research, Newcastle University, Newcastle upon Tyne. NE2 4HH

Research profile and key clinical specialties
I am a consultant medical oncologist treating melanoma patients and also director of the Sir Bobby Robson Cancer Trials Research Centre with responsibility for a busy early phase trials practice. At a national level I sit on CRUK’s Science Funding committee, chair the CRUK New Agents Committee and also am involved in NCRI clinical groups in melanoma and radiotherapy research. I am a member of CRUKs Clinical Research Committee and Science committee. My research interests are melanoma and the DNA damage response, working alongside scientific colleagues in the Northern Institute for Cancer Research. We have a dedicated clinical research team and biomarker development and validation team, working together to take novel agents in the clinic with mechanistic biomarkers. All clinical studentships in NICR are dual supervised to provide training in clinical research as well as scientific laboratory techniques.

Two key publications


Possible PhD projects
Development and validation of mechanistic biomarkers of the DNA damage response in cancer cells and downstream target modulation - preclinical and clinical proof of concept studies within phase I trials.

More information
I teach on a number of post-graduate Master’s programmes for Newcastle University, in early phase clinical trial design.
Professor Sheena Radford

Structural Biology and Biophysics

s.e.radford@leeds.ac.uk

Astbury Centre for Structural Molecular Biology, School of Molecular and Cellular Biology, Faculty of Biological Sciences, University of Leeds, Leeds LS2 9JT

Research profile and key clinical specialties
Sheena Radford, FMedSci, FRS, is Astbury Professor of Biophysics, and Director of the Astbury Centre for Structural Molecular Biology. Her research focuses on protein folding, misfolding and assembly mechanisms.

Her research takes a multidisciplinary approach that crosses the boundaries between biochemistry, chemistry and medicine, and focusses on two major themes. First, we are investigating the role of protein misfolding in the onset of the amyloidogenic diseases, including dialysis-related amyloidosis, Alzheimer’s and type II diabetes.

In a second project, we are focussing on the folding of the outer membrane proteins (OMP) of Gram-negative organisms. These β-barrel proteins require chaperones and a β-barrel assembly machine (BAM complex) to successfully fold into the outer membrane. Using folding and structural studies, Professor Radford’s aim is to elucidate the mechanism of OMP folding by BAM and to use the information to derive new and much-needed antibiotics.

Two key publications


Possible PhD projects
From biophysics to cell biology:
Developing new reagents and assays to understand and prevent amyloid formation and disease

More information
Sheena has mentored 60 PhD students to completion of their PhD studies to date, of which 26 now have academic or research posts, and 10 work in industry.

Wellcome 4ward North Clinical PhD Academy
Two key publications


Possible PhD projects
Circadian clock control of the glucocorticoid receptor.

More information
Supervised 25 PhD students with 100% completion rate.
Respiratory Medicine

s.a.renshaw@sheffield.ac.uk
Academic Unit of Respiratory Medicine, University of Sheffield, Sheffield, S10 2TN

Research profile and key clinical specialties
Diseases of immunity cause much illness in the developed world – on one hand we are beset by a range of antibiotic resistance bacterial infections, while on the other hand our immune systems are responsible for many of the common diseases of ageing – heart disease, stroke and COPD. Understanding the regulation of innate immune cells, neutrophils and macrophages, in infection and inflammation will help us tune the immune system to the exact level needed to cope with the current level of threat. More host defence to fight antibiotic resistant organisms; less host defence to prevent lung damage in response to environmental pollutants. To improve our understanding, I have set up a model system in which the genes controlling regulation of innate immune cell function can be identified. The model I have chosen is the Zebrafish, which is both genetically manipulable and transparent, leading to easy visualisation of immune cells during infection and inflammation. This model allows me to test the ability of a range of candidate genes to influence host-pathogen interaction and the resolution of inflammation, and additionally to screen for novel genes involved in this process. At the same time, I can see every immune cell during the whole of an infection or an inflammatory episode, where necessary imaging intracellular signalling events in real-time. The small size of our model also lends itself to drug screening and this has identified several potential new therapies for immune disease. Projects suitable for a range of specialities, including respiratory medicine, rheumatology, infectious disease etc

Two key publications

Possible PhD projects
1. Mechanism and efficacy of the anti-inflammatory agent Tanshinone IIA in inflammatory disease. 2. Coupling and co-ordination of phagocytosis and bacterial killing by PI3K in vivo.

More information
Director, MRC Discovery Medicine North DTP linking Sheffield, Newcastle, Liverpool and Leeds.
Director, The Bateson Centre
Sir Arthur Hall Professor of Medicine

Wellcome 4ward North Clinical PhD Academy
Primary Care and Ageing

a.l.robinson@ncl.ac.uk

Newcastle University Institute for Ageing, Newcastle University, NE1 4EP

Research profile and key clinical specialties
Professor Robinson leads the Primary Care Group of the Dementia and Neurodegenerative Diseases Research Network (DeNDRoN), a national network of researchers. She is also a member of the University’s Ageing Health and Society Research Group.

The purpose of that group involves a wide range of individuals looking at the impact of our rapidly ageing society, not just on individual health but on the community and society. Within the group she has people looking at how ageing affects population levels. There are others looking at predictors of disability and what the numbers of people with dementia are going to be in the future.

Dementia care currently costs the UK £21bn a year, and that doesn’t include the huge informal costs of family carers and community support networks.

In her position as a GP, Professor Robinson has played a big role in the Newcastle 85+ Study. This has been investigating what is the fastest growing sector of the population, and involved more than 70% of Newcastle and North Tyneside GP practices in helping to recruit over 1,000 people from that age group for the project.

She is also involved in the second stage of the Medical Research Council’s national Cognitive Function and Ageing Study. This again has used GPs to recruit people aged over 65 for research into how well they are ageing, as well as looking at such things as the costs of care and disability levels.

Two key publications


Possible PhD projects
An investigation into patterns of loneliness in the over 65 years old and its effects on mortality using the UK MRC Cognitive Function and Ageing cohorts.

More information
Led the successful application for the MRC DTP award in 2015 and is now director of the DTP.
Infection, Immunity and Cardiovascular Disease

i.sabroe@sheffield.ac.uk

Academic Unit of Respiratory Medicine, Royal Hallamshire Hospital, Sheffield. S10 2JF

Research profile and key clinical specialties
My group works in a variety of areas. We’re particularly interested in airways infection, and how the lung responds to viruses and bacteria. Work includes the study of epithelial cells infected with pathogens like rhinovirus or influenza, and the interaction of bacteria and neutrophils or macrophages. The main aim of this area is to understand how infections drive exacerbation of airways disease.
I also work on pulmonary hypertension, and we are looking at how damage signals drive remodelling in the vasculature.
I combine lab science with studies in people, for example using models of endotoxin challenge in the human to understand how inflammation is regulated.
Finally, I codirect a centre studying medical humanities, in which area I am particularly interested in the use of narrative to understand and explore disease and the needs of both patients and healthcare workers.

Two key publications


Possible PhD projects
Studies of airways infection, pulmonary vascular disease, or application of medical humanities to illness

More information
I have broad interests in science, medicine and interdisciplinary research

Wellcome 4ward North Clinical PhD Academy
Two key publications


Possible PhD projects
Understanding the changes in the regulatory chromatin landscape in the development of oesophageal adenocarcinoma.

Research profile and key clinical specialties.
Andrew’s lab is studying the molecular basis to cancer. They focus on how oncogenic transcription factors function at the molecular level and how they link to cellular signaling pathways. As model systems, they are investigating members of the ETS and Forkhead transcription factor families and how these act in concert with other transcription factors and coregulators to control gene expression.

Signaling to transcription factors during stem cell differentiation – They have conducted a genome-wide RNAi screen to identify novel downstream modulators of the ERK signaling response and wish to explore how these are wired into the upstream signaling pathways. (JBC, 2010, 285, 35728), (Nature 2006, 444, 494).

Control of the cell cycle by transcription factor complexes - (Nature 2006, 444, 494).

Control of transcription by SUMO modification - Projects in the lab are aimed at understanding how SUMOylation is regulated in response to signaling pathway activation, and the molecular mechanisms through which SUMOylation causes transcriptional repression (Mol. Cell, 2004, 13, 611).

Transcriptional regulatory networks (Genome Research, 2009, 19, 1963).


More information
Previously been Director of the Faculty of Life Sciences BBSRC DTA and Wellcome Trust dynamic systems programme.
Two key publications


Possible PhD projects
Identification of translatable biomarkers of motor neuron injury and neuroprotection in experimental models of amyotrophic lateral sclerosis and the human disease.

More information
Supervised to completion 30 PhD students, including 11 clinical fellows.
Developmental Genetics

d.strutt@sheffield.ac.uk

Department of Biomedical Science, Bateson Centre, Dept of Biomedical Science, University of Sheffield, Sheffield. S10 2TN

Research profile and key clinical specialties

David is interested in understanding how the human body grows and develops to form complex tissues and organ systems. This involves the regulation and coordination of three processes: first, the multiplication of cells; second, the differentiation of the right types of cells in the right positions; third, the correct orientation of cells relative to each other. It is this final process in which we are primarily interested. As the orientation of cells relative to each other is a fundamental conserved process in animal development, we are able to study it using a model experimental system, of which the most powerful and flexible currently available is the fruit fly Drosophila melanogaster. The simplicity of manipulation of Drosophila, particularly for studying the function of genes, has allowed the identification of a large number of genes that are involved in the coordination of cell orientation.

Two key publications


Possible PhD projects

Model organism approaches to mechanistic analysis of planar polarity pathway gene mutations implicated in human congenital birth defects

More information

2 PhD students currently
Professor Reuben Tooze

Haematopathology

r.tooze@leeds.ac.uk

Leeds Institute of Cancer and Pathology, Section of Experimental Haematology, University of Leeds, St James’s University Hospital, Leeds. LS9 7TF

Research profile and key clinical specialties

My research focuses on understanding the process of how B-cells differentiate into plasma cells in the immune system, and how this process is corrupted to generate immune system cancers including lymphoma and myeloma. There is a particular focus on transcriptional control and the relationship to survival niche factors governing the lifespan and functional specialisation of differentiated plasma cells. We aim to link an understanding of normal and aberrant control of the differentiation process to the identification and evaluation of new approaches to treatment, clinical diagnosis and biomarkers. Two general themes are the development of model systems and the integration of both in house and public data sets with bioinformatics approaches. We collaborate particularly with clinical colleagues at the Haematological Malignancy Diagnostic Service, Leeds Teaching Hospitals NHS Trust (http://www.hmds.info/), and the bioinformatics laboratory of Prof David Westhead, University of Leeds.

Two key publications


Possible PhD projects

Investigating the origins of human plasma cell heterogeneity.

More information

Director Cancer Research UK Leeds Centre Dec 2015 onwards.

Wellcome 4ward North Clinical PhD Academy
Professor Sir Doug Turnbull

Neurology

doug.turnbull@ncl.ac.uk

Institute of Neuroscience, Wellcome Trust Centre for Mitochondrial Research, Mitochondrial Research Group, Medical School, Newcastle University, Newcastle upon Tyne. NE2 4HH

Research profile and key clinical specialties

The Institute of Neurosciences areas of research span from the basic biology of neurons to the abnormal activity associated with epilepsy, from music perception to mood disorders, from visual object recognition to retinal prostheses for the blind, from animal decision-making to anaesthesia to neurological disease. This breadth of interest stimulates innovative approaches to our science.

Director Wellcome Trust Centre for Mitochondrial Research - The Wellcome Trust Centre aims to establish a world-leading Centre dedicated to the biology of mitochondria in health and disease and so make a major difference to the lives of patients with disease caused by mitochondrial dysfunction.

National lead for the NHS National Highly Specialised Services for Rare Mitochondrial Diseases of Children and Adults - This service is for all patients with mitochondrial disease in the UK. The service was originally designated in April 2007 and involves 3 centres (Newcastle, London and Oxford). The service provides diagnostic investigations for patients suspected of mitochondrial disease which includes biochemical, histochemical and molecular genetic studies.

Director, Newcastle University Centre for Brain Ageing and Vitality - The Lifelong Health and Wellbeing programme was launched as one of the major cross research council grand challenges. Three ‘lifelong health and wellbeing’ research Centres were funded by the BBSRC, EPSRC, ESRC and MRC in 2008 and I am Director of the Newcastle University Centre for Brain Ageing and Vitality.

Two key publications


Possible PhD projects

Understanding the mechanisms causing progression in patients with mitochondrial disease.

More information

Previously supported/sponsored ten clinical fellowships through to PhD.
Research profile and key clinical specialties
My research focus is the physics and engineering and clinical applications of MR imaging of hyperpolarised gases (3He and 129Xe) and protons in the lungs and pulmonary vasculature. The Physics and engineering projects technical developments have made a clinical impact, we have performed the first clinical studies in the UK with hyperpolarised 3He and 129Xe gas MRI. Our research has demonstrated the role of these pulmonary MRI methods in Asthma, COPD, Cystic Fibrosis, Interstitial Lung Disease, Lung cancer and Pulmonary Hypertension. Using hyperpolarised gas and proton lung MRI as markers we are evaluating novel pulmonary therapies in collaboration with pharmaceutical companies. Our lung imaging methods and models are the basis of patient specific models of lung disease and exacerbation within the EU Virtual Physiological Human Project - Airprom. Our pulmonary methods have made a clinical impact on NHS radiological practice in the diagnosis and management of patients from the Sheffield Pulmonary Vascular Disease Unit. We are now a national and international referral centre for Clinical Pulmonary Imaging.

Two key publications


Possible PhD projects
Functional imaging of the lungs with hyperpolarised gas MRI

More information
Other general research activities in research training include ISMRM and ESMRMB training schools in lung MRI and hyperpolarisation.