NHS Research Scotland (NRS) and Scottish universities Scottish Senior Clinical Fellowship Scheme 2018

Applications are invited from outstanding early career clinical academics (medical or dental) for five-year tenure track senior research fellowships to be held in one of the five Scottish universities with Medical or Dental Schools.

The scheme aims to support outstanding clinical scientists in their transition to leadership and provides an attractive research-focussed entry point to a permanent clinical academic career in one of five excellent research environments. The Academy of Medical Sciences is a partner in this scheme and those appointed will be invited to join the Academy's Mentoring programme.

The scheme is funded by a partnership between the Chief Scientist's Office, Scottish NHS Boards (which together support NRS) and the universities of Aberdeen, Dundee, Edinburgh, Glasgow and St Andrews.

Requirements

All applicants should have:

- post-doctoral (PhD/MD) research experience
- a strong publication record in your discipline
- have won competitive research or fellowship funding prior to application

All applicants require support from the Head of the Medical/Dental School. Potential applicants are encouraged to make specific enquires of each of the partner universities (details provided in 'Further Particulars', below)

How to apply

Please review the 'Further Particulars' for details of how to make an application. Candidates are advised to review this information well in advance of the closing date. Shortlisted applicants will be invited to interview in Edinburgh on Friday 9 November 2018.

All applications must be received by 5pm on Monday 11 June 2018 via Universities Scotland by email to Heather Sloan (heather@universities-scotland.ac.uk).

Queries regarding eligibly should be directed to the potential host university.

Closing date: 5pm on 11 June 2018

Pay scale

Posts will be held on the clinical academic consultant scale (which is currently £78,304-£105,570) and will commence on a date agreed with the host institution.

Equality and diversity

We welcome applications from all sections of the community.

All five medical schools are committed to the Athena SWAN Charter principles and hold departmental awards to recognise their commitment to gender equality.

Further Particulars

Detail of the Scheme

The Scheme offers:

- five years of protected time in which to develop an internationally competitive research programme
- progression to a permanent clinical academic appointment, subject to satisfactory progress which should be formally assessed by the host university
- the flexibility to be appointed to the Scottish university most suited to the applicant's interests
- independent mentorship organised by the Academy of Medical Sciences
- five years of support for a research assistant (£35K/year total salary costs), research consumables (£23K/year) and a contribution to the costs of one PhD student over the five year period (£60K)

Host institutions will be supportive of early career clinical academics who:

- have post-doctoral research experience subsequent to a research training period leading to a PhD or MD
- can demonstrate an exceptional record of discovery evidenced by high quality publications in their discipline
- have obtained competitive fellowship or research funding prior to application
- can present research proposals that are likely to lead to further high quality publications and external research funding, and which synergise with the institution's research strategy
- will be eligible by October 2018 for independent clinical practice in Scotland

How to apply

Step 1: Establish the University is supportive of your proposed application

Potential applicants are encouraged as soon as possible to make specific enquires of each of the partner universities as applications **require** support from the Head of College/Dean/Head of School (as listed below) judged by applicants to best fit with their planned research programmes.

To make enquires please contact:

- **Aberdeen**: Professor Steven Heys, Head of School of Medicine, Medical Sciences and Nutrition, University of Aberdeen, Polwarth Building, Foresterhill, Aberdeen, AB25 2ZD; Tel: 01224 437966; Email: s.d.heys@abdn.ac.uk; Website: www.abdn.ac.uk
- **Dundee**: Professor Gary Mires, Dean of Medicine, University of Dundee, Ninewells Hospital and Medical School, Dundee, DD1 9SY, Tel: 01382 383540, Email: g.j.mires@dundee.ac.uk; Website: www.dundee.ac.uk
- **Edinburgh**: Professor Moira Whyte, Vice-Principal and Head of College of Medicine and Veterinary Medicine, The University of Edinburgh, The Queen's Medical Research Institute, 47 Little France Crescent, Edinburgh, EH16 4TJ; Tel: 0131 242 6561; Email:moira.whyte@ed.ac.uk; Website: www.ed.ac.uk
- **Glasgow**: Professor Dame Anna Dominiczak, Vice-Principal and Head of College, College of Medical, Veterinary and Life Sciences, The University of Glasgow, Wolfson Medical School Building, University Avenue, Glasgow, G12 8QQ; Tel: 0141 330 3362/2738; Email: Anna.Dominiczak@glasgow.ac.uk; Website: http://www.gla.ac.uk/colleges/mvls/
- **St. Andrews**: Professor David Crossman, Dean of the Faculty of Medicine, University of St Andrews, Medical School, North Haugh, St. Andrews, Fife, KY16 9TF; Tel: 01334 463597; Email: medical.dean@st-andrews.ac.uk; Website: www.st-andrews.ac.uk

The university is most likely to be able to help you if you provide:

- A full CV
- A draft personal research plan statement
- A draft research plan

Details of the form of these documents is provided under step 2

Step 2: Putting together your application

Applications must consist of:

1. A letter of support from the Head of the host Medical/Dental School (an email is satisfactory)
2. A full CV detailing publications, grants/fellowships and CCT status
3. A one-page statement of personal research plans. This should be a 'big picture' summary of where your research plans are going to take you and the field over the next 10 years, together with a frank assessment of which external funders may support the work
4. A five-year research programme, written in the general format of a MRC project grant application but limited to five A4 pages (NB: there is no special form and the Je-S application system is not to be used) with up to two pages of supplementary data/appendices and one page of abbreviated literature references. This document should focus on what you and one Research Assistant would deliver over five years
5. Details of three referees able to comment on your potential as a research leader

Presenting a five-year research programme as part of your application

General
This should be written in Verdana point 10 with margins of 2cm at the left, and 1.5cm on all other borders. Do not exceed page limits.

Proposal
In no more than five A4 sides describe a research programme that you and a Research Assistant could deliver in five years. This should be in a conventional 'project grant' format – Title; Application; Summary; Aims of the Project; Work Leading up to the Project; Research Plan; Justification of Resources Requested (please observe the ARRIVE guidelines where appropriate).

Additional material
You may submit one A4 side with (abbreviated) literature references needed for the project and up to two A4 sides for supplementary data/appendices

Applications may propose approaches that span the full range of biomedical research models. Nevertheless applicants are encouraged to include work employing human subjects or tissues wherever possible (ethical approval will be required before funds are released, so should be sought in parallel).

Step 3: Submit your application

Full applications must be received by email by 5pm on Monday 11 June 2018 to Heather Sloan at Universities Scotland via heather@universities-scotland.ac.uk

Please note that your application must be submitted as a **single** PDF document.

Appointment process

The Academy of Medical Sciences will organise peer review of your application. The scheme partners have appointed an independent interview panel to recommend successful candidates. The panel is chaired by Professor Paul Stewart (Faculty Dean of Medicine and Health, University of Leeds).

The process is overseen through the Board for Academic Medicine which is chaired by Professor Sir Peter Rubin and the process run through the secretariat based at Universities Scotland.

Shortlisted candidates will be given at least two weeks' notice of interview. The interview will be held in Edinburgh on Friday 9 November 2018.

Terms and conditions

Following receipt of recommendations from the interview panel, the host University will confirm an appointment to each successful candidate (three fellowships are available in the round, subject to application quality). It is anticipated that appointments will commence on a date agreed with the host institution subject to mutual agreement, and that these will be held at an appropriate point on the clinical academic consultant scale which is currently £78,304 to £105,570.

Disclosure / protection of vulnerable groups scheme

This post is subject to registration with the Protection of Vulnerable Groups (PVG) scheme. Employment in this post is conditional on the University receiving a satisfactory PVG scheme record/update certificate. The successful candidate will not be permitted to commence employment

until this has been received. Information provided will be kept confidential and individuals will not be discriminated against unnecessarily due to non-relevant offending background. If you require further information regarding Disclosure & PVG, please refer to: www.disclosurescotland.co.uk.

Application checklist

Requirement	
Letter of support from Head of College/Dean/Head of School	□
Full CV	□
One page 'big picture' statement of research plans	□
Five page research programme	□
Details of 3 referees	□

The Universities reserve the right to vary the candidate information or make no appointment at all. Neither in part, nor in whole does this information form part of any contract between any of the Universities and any individual.

Opportunities in the five universities

Aberdeen

In Aberdeen, clinical and translational research have benefited from the co-location of the main teaching hospitals and research facilities, including the recently opened newly built Rowett Institute of Nutrition and Health (RINH), on one of the largest integrated health campuses in Europe. The University has invested over £120milion in regenerating the medical research infrastructure at Foresterhill. This has resulted in completion of a 7-storey Institute of Medical Sciences (IMS), renovation of the main Medical School Building, creation of the state-of-the-art Medical Research Facility and completion of a Health Sciences Building which houses a dedicated clinical research facility for translational research. The new 5-storey building for the Rowett Institute of Nutrition and Health (RINH) opened in April this year. The IMS has enabled development of a strong infrastructure that supports the laboratory-based research community. The Institute is justifiably proud of its modern core-facilities available for use by all researchers – these include the Ian Fraser Cytometry centre, Proteomics, pQCR and advanced microscopy. The Centre for Genome-Enabled Biology and Medicine is housed in part on the campus and offers access to next generation sequencing and a team of bioinformaticians.

The physical development of the research campus has been matched by investment in research posts. The overall effect has been to intensify the research effort that links laboratory-based research to patient studies through collaborations established between scientists, epidemiologists, statisticians, and clinicians. With the opening of RINH the opportunities for translational nutrition research have intensified. Aberdeen has considerable historical and current expertise in preclinical and clinical imaging (PET/CT backed by a dedicated cyclotron, 3T-4.7T MRU), that facilitates such translational research. The University works very closely with the NHS R&D office and has a common research governance framework, to ensure that the same supportive structures are in place wherever clinical research is undertaken. An accredited tissue-bank, Grampian Biorepository, is supported by NHS R&D who also jointly support the Grampian Data Safe-Haven which provides Health Informatics expertise. A fully registered Clinical Trials Unit (CHaRT) with particular expertise in surgical and device trials is highly productive. We are actively fostering opportunities for clinical academic career development at the level of senior lectureship in each of our key areas of research strength in our new research strategy. At earlier levels, we are putting more resource into building the academic careers of our increasing numbers of Scottish Clinical Research Excellence Development Scheme (SCREDS) lecturers and have strengthened the Aberdeen Clinical Academic Training scheme (ACAT http://www.abdn.ac.uk/smmsn/acat/). The most recent development is the creation of an annual cohort of around ten core trainees, supported in part by our Wellcome Institutional Strategic Support Fund (ISSF).

REF2014 identified the outstanding quality of the impact of our work on practice with 83% assessed as 4* and 17% as 3*.

MRC Centre for Medical Mycology comprises one of the largest fungal research groups at the cutting edge of medical mycology holding more than £24 million of research funding from charities and research councils including a Wellcome Trust Strategic Award in Medical Mycology and Fungal Immunology. Research in the Centre falls under six innovative and cross-disciplinary research themes:

(i). Fungal cell surface dynamics and its impact on antimicrobial chemotherapy and host immunity, (ii) Fungal components as antifungal drug targets, diagnostics, vaccine antigens and adjuvants, (iii) Fungal growth, adaptation and morphogenesis in the context of infection, (iv)Temporal host-fungal interactions and key mediators that influence disease establishment and progression at molecular, cellular and organismal levels, (v) Exploiting emerging technologies to generate global perspectives that broaden our mechanistic understanding of host-fungal interactions, (vi) Unravelling patient susceptibility to enable diagnosis, treatment and prevention of fungal disease.

Centre for Arthritis and Musculoskeletal Health which is which is currently part of two Arthritis Research UK Centres of excellence jointly with Universities of Cambridge and Southampton and EULAR Centre of Excellence. The focus is three fold (i) the development and validation of "clinically relevant" assays and surrogate measures of the potency of stem cell preparations, to be used as quality controls for efficacy of stem cell therapies in the clinic, and (ii) characterizing the niches of resident stem cells within the joint environment and studying their molecular regulation in vivo in health and disease (osteoarthritis, rheumatoid arthritis) and developing novel therapeutics for joint repair. (iii) By combining basic molecular and cell biological research with patient studies, the group seek to develop new or better ways of diagnosing and treating musculoskeletal disorders including pain.

Nutrition and Health The Rowett Institute is an internationally recognised centre of excellence underpinned by a rolling 5 yearly programme of funding from Scottish Government, worth £8m per annum. Its research is focused around 4 main areas: Obesity and Food Choice; Metabolic Health; Gut Health and Lifecourse and Population Health. Associated with this, the University was recently awarded a MRC Discovery Award to increase capacity and develop/invent new technology in the neurobiology of obesity. There is strong expertise in the gut microbiome, offering an exciting area for potential clinical exploration and intervention and a strong interest and expertise in Public Health Nutrition.

Population Health (Institute of Applied Health Sciences) Two Chief Scientist Office funded units (Health Economics Research Unit and Health Services Research Unit) are located in Aberdeen. These units provide excellent support for senior clinical academics in Applied Health Sciences from a wide variety of specialities and backgrounds bringing particular expertise in epidemiology, population health, knowledge synthesis, clinical trial planning, healthcare evaluation and economic modelling. There is expertise in Health Psychology with reference to adherence to therapy and dietary and physical activity behavioural change. The Centre for Healthcare Randomized Trials (CHaRT) develops high quality Randomised Controlled Trials providing access to the core competencies of experienced trialists, trial management, data processing and management, statistics, and health economics.

Cardiovascular Disease Focuses on understanding the complex processes that are involved in the development of heart and blood vessel disease and the underlying risk factors. Studies involve a diverse range of approaches and experimental models from genes and proteins, to cells and animal models through to the clinical setting. There is a concentration on investigation of obesity, type-2 diabetes, hypertension, stroke, cardiomyopathy and heart failure

Immunity, Infection and Inflammation Encompasses cutting edge research in a wide range of basic and clinical disciplines. The underlying philosophy is to investigate mechanisms of disease and to translate the findings into clinical practice. The programme boasts expertise in a number of clinically relevant disease areas including, renal, haematology, cancer, respiratory and gastroenterology.

Cell Development and Cancer Biology Work increases the understanding of the roles of cell and molecular biology in a variety of human diseases. This includes the study of developmental diseases and birth defects (e.g. limb, club foot and vision) but also developing treatments of various cancers (e.g. breast, prostate, lung, gastro-intestinal), adult diseases (e.g. diabetes, cardiovascular, reproductive Alzheimer's) and traumatic injuries.

Translational Neuroscience uses a diverse range of experimental models and approaches to study neuronal function and malfunction, from single genes and molecules to humans. Research investigates genetic, molecular and systems aspects, and incorporates functional as well as structural components based on a wide range of techniques to study the neurobiology of disease and disorders of the nervous system, as diverse as spinal cord and eye injury, schizophrenia, depression, diabetes, Alzheimer's and Parkinson's disease**.**

Dundee

Biomedical research in the University of Dundee is based in the Schools of Medicine and of Life Sciences which work closely together to integrate research in clinical and basic science. This has resulted in new capital builds and infrastructure, joint appointments, joint planning of research programmes and joint PhD programmes. Research in the School of Medicine is based primarily in the Ninewells Campus, while that in Life Sciences is on the city campus. The range of research interests, and the major research facilities across the Schools outlined below, allows Dundee to offer an ideal opportunity for ambitious clinical academics to develop an independent research career in a highly supportive environment. The strength of biological science research in Dundee was recognised in the REF 2014 outcomes, with the submission being first in the UK for the quality of its research outputs and environment; the impact of clinical research was also rated first in the UK. Life Sciences and Medicine have major support from the Medical Research Council; the Wellcome Trust; Cancer Research UK; and the British Heart Foundation.

The **School of Life Sciences** (http://www.lifesci.dundee.ac.uk/research/) incorporates the Wellcome Trust Centre for Gene Regulation and Expression, the Scottish Institute for Cell Signalling, the MRC Protein Phosphorylation Unit, CRUK Nuclear Acid Structure Research Group and the Drug Discovery Unit. There are major strengths in molecular parasitology; the understanding of cell signalling and protein phosphorylation in the identification of potential novel drug targets; and in the application of mathematical modelling to aid a more complete understanding of biological systems. The new £35M Discovery Centre opened in 2014, with outstanding new facilities to support the research programmes of within the College, and houses a new advanced centre for proteomics, offering major opportunities for applied clinically relevant research.

Research within the **School of Medicine** (http://medicine.dundee.ac.uk/research-1) is carried out in newly built and refurbished state of the art laboratories, which include core facilities for cytology, microscopy and genomics. There has been substantial recent investment in facilities to support microscopy; sequencing; and advanced biomarker analysis; core facilities are managed in an integrated manner with the School of Life Sciences. Translational clinical research is strongly supported by the **Tayside Academic Medical Sciences Centre**, which is a joint development between the University of Dundee and NHS Tayside, and is part of the Academic Health Science Partnership in Tayside. This supports high quality research facilities in a purpose built Clinical Research Centre which houses an integrated Imaging Research Centre providing clinical, pre-clinical and molecular imaging (MRI/fMRI, PET/CT) on a single site. The adjacency of these facilities with a major teaching

hospital (Ninewells) and the newly commissioned laboratories positions Dundee at the heart of major Scottish initiatives in translational research. The research complex houses the unique Institute of Medical Science and Technology, which has an international reputation for research into novel applications of ultrasound and interventional imaging. The research infrastructure includes a UK registered Clinical Trials Unit and coordinates all research permissions and governance issues.

Health informatics and **Precision Medicine** are major themes of clinical research in Dundee, targeted at using 'big data' to improve the health of individuals and society. Significant internal investment was made in 2012-3 to enhance the Health Informatics Centre capacity and this has been associated with major external funding for the Farr Institute, which is led jointly by the University of Dundee and partners, with the Farr Institute at Dundee being one of the two significant Scottish nodes with new infrastructure. The MEMO programme provides leadership in the development of novel design for large scale clinical trials.

Dundee hosts a large array of data sets including both national and comprehensive regional data on ~1M people (https://www.dundee.ac.uk/hic/datalinkageservice/datasetinventory/). Key strengths include more than 30 years of prescription encashment data and routinely collected imaging data on our bioresrouce populations. Dundee is world leading in diabetes informatics, with the now national Scottish Care Information Diabetes Collaboration (SCI-Diabetes) electronic medical record system originating in Tayside. The Scottish Diabetes Research Network (Lead McCrimmon, Dundee) hosts all clinical data for research use on ~250,000 patients. Dundee also hosts large bioresources of consented patients, with DNA, biosamples and extensive linkage to comprehensive electronic medical records. We consider the availability of genetic and other biomarker data the perfect bridge between health and biomedical informatics, enabling both forward (from molecule to patient) and reverse translation (from patient to molecular biology).

In Tayside, Scotland (population 400,000) we have established the scientific value of integrating comprehensive Electronic Medical Records from a highly sophisticated regional health informatics infrastructure with large consented bio-resources. We have assembled record linked bio-resources that comprise over 70,000 individuals (15% of the Tayside population) which includes disease-centred studies of diabetes, COPD, heart failure and asthma, but also includes population and family based resources (Generation Scotland-Scottish Family Health Study) and have established the use of population based pre-consent for the retention and research on clinical left over blood samples (GoSHARE) (see http://medicine.dundee.ac.uk/tayside-bioresource). This has allowed us to incorporate genomic information in the stratification of clinical phenotypes including drug response disease susceptibility and rate of disease progression.

Diabetes/ Endocrinology and Cardiology are major research strengths in Dundee. Dundee hosts a broad programme of translational research in Diabetes from bench to bedside and back again. Dundee has been in the top 4 of Diabetes UK funded research every year since 2010, and has received more financial research support that the rest of Scotland combined. Dundee has had more RD Lawrence Lectures awarded by Diabetes UK than any other UK institute. Opportunities are available in areas such as protein phosphorylation, insulin signaling, oxidative stress, hypothalamic regulation of glucose and energy metabolism, multiple endocrine neoplasis, non-alcoholic fatty liver disease, clinical studies of insulin action and hypoglycaemic responses and hypoglycaemia awareness, as well health informatics and precision medicine. Research in Cardiology covers a spectrum from the basic science of protein palmitoylation, oxidative stress, ischaemia reperfusion

and vascular function to the repurposing of old drugs for use in the clinical management of resistant hypertension and cardiac failure.

Cancer research at Dundee is among the best in the UK.

An extensive portfolio of Cancer Research ranges from molecular cell biology and drug discovery to population screening, with Dundee leading the Scottish bowel cancer screening programme. There are 5 major programmes funded by CRUK within the purpose built Jacqi Wood Cancer Centre. This supports all of the laboratory aspects of cancer research and the translational work that is the core of the new developments. The same environment houses the Dermatology and Genetic Medicine group, which is a Wellcome Trust centre aimed at understanding the genetic and molecular basis of skin disease; and which works alongside a CRUK programme funded group with an international reputation in skin cancer.

The University of Dundee also hosts the **Centre for Antimicrobial Resistance.** The Centre for Antimicrobial Resistance at the University of Dundee brings together biologists, chemists, physicists, clinicians, mathematicians, epidemiologists, engineers and designers to focus on innovation in tackling antimicrobial resistance. Members of the Centre are located across the institution in the School of Life Sciences Research, the School of Medicine, the School of Engineering, Mathematics and Physics, the School of Computing, Duncan of Jordanstone College of Art & Design and NHS Tayside. Researchers within the Centre work on a variety of areas such as identifying targets for new therapeutic agents through basic research; developing innovative technologies for application in AMR research, driving leadership in antibiotic stewardship and performing drug discovery programmes to develop new antimicrobial agents. Much of the work of the Centre is carried out in multidisciplinary collaborations between different groups within Dundee and beyond. The Centre also links into the Academic Health Science Partnership in Tayside (AHSP), which brings together University of Dundee and NHS Tayside to improve the health of the population in Tayside and beyond through advancement of health research, education of healthcare professionals and improved quality & safety of healthcare services.

Edinburgh

The University of Edinburgh (UoE) College of Medicine and Veterinary Medicine (http://www.ed.ac.uk/schools-departments/medicine-vet-medicine) offers rich opportunities for clinical academic career development at the Senior Fellowship level. The high quality of the research environment is evident from many parameters (e.g. in REF 2014 we ranked 4th equal in the UK on research power in Clinical Medicine; in Neuroscience were again ranked 4th in the UK on research power). Overall, 84% of the College's research activity was rated world leading or internationally excellent (3* and 4*) from the 447 FTE staff returned. Edinburgh is ranked 17th in the world for Clinical, Pre-Clinical Medicine and Health (Times Higher ranking position in 2018).

Our research approaches range from molecules to man, from bench to bedside and from process to population. We have pursued a strategy of interdisciplinarity and integration of basic, clinical and social sciences in our research centres, schools and institutes. To address big questions in biomedical research we embrace innovation and bring the power of physical sciences - for example chemistry, physics, informatics and engineering - to biomedical problems. To embed our research in the

community we link biomedical researchers with social scientists in law, ethics, and governance, and work to a University-wide strategy for public engagement

The academic disciplines within the Edinburgh Medical School are largely concentrated in the two teaching hospital campuses, the Royal Infirmary at Little France and the Western General Hospital. Both have extensive new infrastructure with major research institutes and state of the art research facilities on clinical sites. We have over 2,000 undergraduate students in medicine and biomedical sciences and over 2,500 postgraduate students on campus and online. We are delighted that all three Deaneries within the Edinburgh Medical School now hold silver Athena Swan awards.

Edinburgh hosts many prestigious externally-funded Research Centres including the MRC Human Genetics Unit and 4 MRC Centres in Inflammation Research http://www.cir.ed.ac.uk, Regenerative Medicine http://www.crm.ed.ac.uk, Reproductive Health http://www.ed.ac.uk/centre-reproductive-health, Cognitive Ageing and Cognitive Epidemiology www.ccace.ed.ac.uk, the CRUK Edinburgh Cancer Centre and a BHF Research Centre. The Centre for Genomics & Experimental Medicine hosts an MRC Molecular Pathology Node. Edinburgh also contains the Usher Institute for Population Health Sciences and Informatics which hosts a major hub of Health Data Research UK. Edinburgh Neuroscience is one of the Centres of the MRC's Dementia Research Institute. Recent developments in neuroscience include the £10M Anne Rowling Centre for Regenerative Neurology and a recent £20M award for the Simons Initiative in the Developing Brain.

Our strategy is underpinned by long-term investments. Over the last 15 years, we have invested over £350M in new infrastructure in our campuses. A new £60M Institute for Repair and Regeneration based at Little France will open in 2020, allowing co-location of researchers from the MRC Centre for Inflammation Research and the MRC Centre for Regenerative Medicine. Moreover, since 2008 we have appointed 50 medical clinicians to run-through academic training posts, largely funded by a flagship Wellcome Clinical PhD Scheme. Since 2012, we have appointed more than 100 outstanding new tenure-track, early career 'Chancellor's Fellows' (CFs) in relevant disciplines of biology, medicine and humanities.

Clinical Research Infrastructure

Edinburgh Imaging The University of Edinburgh has well developed international expertise in magnetic resonance imaging of brain and body. Edinburgh Imaging houses Scotland's first PET-MRI scanner, the Siemens Biograph mMR. We also house the Siemens Magnetom Verio 3T MR scanner and two 128-multidetector PETCT scanners currently performing FDG-imaging. Our PET scanners are served by the GMP Radiochemistry department, which includes a dedicated Cyclotron (PETtrace 8, GE Healthcare) with a supporting Radiochemistry suite accredited by the MHRA.

The Wellcome Trust Clinical Research Facility (www.wtcrf.ed.ac.uk), is an outstanding environment for clinical research, acknowledged nationally, and reported as exemplar by Academy of Medical Sciences. It provides state-of-the-art facilities and an optimal environment for the conduct of clinical research. It employs over 60 members of staff. The facility has several Core areas including integrative physiology, genetics, mass spectrometry, statistics, image analysis and education as well as the Experimental Cancer Medicine Centre.

Edinburgh Clinical Trials Unit fulfils both clinical research governance and trial design and support.

Since the University hosts the Edinburgh Postgraduate Dental Institute, dental candidates could also be accommodated. Thus, the University can provide an ideal research environment for clinicians from the vast majority of disciplines.

Glasgow

The University of Glasgow's world class clinical research environment was ranked joint first in Scotland in REF2014 and provides exceptional infrastructure and support to those interested in developing an independent clinical academic career (overall, our clinical medicine ranked 6th in the UK and 2nd in Scotland). The **College of Medical, Veterinary and Life Sciences (**http://www.gla.ac.uk/colleges/mvls/) is home to over 2,300 staff, has an annual turnover exceeding £205M and secured over £120M of research income in 2016/17 including major research programmes supported by the MRC, BBSRC, and charities such as the Wellcome Trust, CRUK and the BHF. The College offers a unique environment where life scientists and clinicians work side-by-side and our collaborative, interdisciplinary approach means we can study processes at every level of their biological organization, from genes, to cells, organs, individuals and populations. This multidisciplinary approach is highly successful: 15% of our publications are amongst the top 5% most cited globally (placing us 3rd in the Russell Group for field weighted citations). Our internationally excellent clinical research impacts widely across the UK and internationally to improve human health, quality of life and the competitiveness of the UK economy.

The University of Glasgow has invested heavily in new biomedical research infrastructure. State-of-the-art laboratories for cancer research complement new clinical facilities (including extensive resources for clinical trials) within the new **Beatson Oncology Centre**; the £20M **Wolfson Wohl Translational Research Centre** houses world-leading clinicians and scientists working to transform scientific advances in the lab into real benefits for patients; the **Glasgow Biomedical Research Centre** and the adjacent **BHF Centre of Excellence in Vascular Science and Medicine** provide comprehensive facilities for molecular, cellular, physiological and clinical research studies across a range of key academic disciplines. The Wellcome Trust-supported **Glasgow Polyomics Facility** provides expertise in the application of genomic, transcriptomic, proteomic and metabolomic technologies to any biological system. The **Arthritis Research UK Rheumatoid Arthritis Pathogenesis Centre of Excellence**, led by Glasgow with the Universities of Newcastle and Birmingham makes use of our collective expertise to understand the mechanisms behind this disease and how we can use this knowledge to develop more effective treatments. The Medical Research Council and the University have jointly invested £38M in the **MRC - University of Glasgow Centre for Virus Research**, creating the UK's largest grouping of virologists. The University is also jointly investing £45M in the **MRC/CSO Social and Public Health Sciences Unit** providing world class facilities and data linkage capabilities for our leading edge research into social, behavioural, economic, cultural and environmental influences on health.

The **Queen Elizabeth University Hospital** (QEUH) represents an investment to Glasgow and Scotland in the region of £1Billion. Opened in 2015, the hospital is the largest acute hospital in Western Europe and includes maternity, paediatric and adult services on a single site. The College has invested over £70M in new physically-linked facilities at the Queen Elizabeth University Hospital which include:

- A £25M purpose-built **Learning & Teaching Centre** for medical training;
- The £32M **Imaging Centre of Excellence**, incorporating the UK's first 7T MRI scanner in a fully integrated clinical site
- The **Stratified Medicine Scotland Innovation Centre**, a Glasgow-led, Scotland-wide collaboration with industry and the NHS aimed at developing precision medicine and providing leadership for Scotland's Precision Medicine Ecosystem
- A £5M **Clinical Research Facility** for precision medicine clinical trials in adults, adolescents and children.
- A 22, 000sq ft. industry-focused, Clinical Innovation Zone providing access to the University's internationally renowned researchers in state-of-the-art facilities

Co-located in a purpose built Laboratory Medicine Building at QEUH, the UK's largest (£3.4M) **MRC-EPSRC funded Molecular Pathology Node** is enabling scientists, pathologists and clinicians to be trained and to collaborate with our industry partners to develop new diagnostic tests. These facilities place Glasgow at the forefront of driving precision medicine forwards for the UK and internationally.

The University of Glasgow is also a founding member of the **Glasgow Biomedicine** partnership. Glasgow Biomedicine supports clinical research by enabling access to the patient base of NHS Greater Glasgow & Clyde and the surrounding health boards of the West of Scotland. Glasgow Biomedicine supports access to an NHS patient base of 2.8million (52% of the Scottish population) and includes areas of significant health inequalities and high incidence of premature chronic disease and comorbidities. The infrastructure available through this partnership includes: the **Robertson Centre for Biostatistics** (with an international reputation for clinical trials, epidemiology and health economics); state of the art clinical research facilities; a biorepository; and, through the NHS 'Safe Haven' and the Farr Institute, the ability to readily access high quality data via the Community Health Index (CHI). The University's clinical research income exceeds £21.5M annually, from a portfolio of around 1,500 active clinical studies with approximately 17,000 patients recruited to clinical trials across a broad range of disease areas.

The quality of our research in clinical medicine was confirmed by REF2014, which cemented our world-class reputation for studies into cancer, cardiovascular, and immune and inflammatory diseases with over 80% of our return being assessed as internationally excellent or world-leading. Specific research strengths are under-pinned by our cross-disciplinary ethos and our clinical research benefits from expertise in public health, health economics, epidemiology, biostatistics and bioinformatics, as well as excellence in basic biomedical science. These academic research strengths offer extensive opportunities for new academic Clinical Senior Lectureships.

The College includes seven interdisciplinary Research Institutes (http://www.gla.ac.uk/colleges/mvls/researchinstitutes/) and three Schools (http://www.gla.ac.uk/colleges/mvls/schools/). The Institutes and School where aspiring clinical fellows are most likely to find mentors are shown below in bold.

- Institute of Cancer Sciences
- Institute of Cardiovascular and Medical Sciences
- Institute of Infection, Immunity and Inflammation
- Institute of Health and Wellbeing
- Institute of Neuroscience and Psychology
- Institute of Molecular, Cell and Systems Biology

- Institute of Biodiversity, Animal Health and Comparative Medicine
- School of Medicine, Dentistry & Nursing
- School of Life Sciences
- School of Veterinary Medicine

The University of Glasgow is committed to developing a critical mass of clinical fellowships and invests through pump-priming initiatives and mentorship programmes. Our world-class research environment combines complete integration of clinical and academic practice, and we are confirmed international leaders in cancer sciences; cardiovascular and medical sciences; Infection, Immunity and Inflammation and public health. Opportunities for clinical academic career development at the level of senior lectureship exist across all areas, including the leading and research-led Glasgow Dental School.

St. Andrews

Research in the St Andrews Medical School is based in the new state of the art building on the North Haugh (£45 m) built with the support of the the Wellcome Trust, the University and benefactors. The Medical School is co-located with the Schools of Physics, Chemistry and the Biomedical Research Science Centre. This provides the opportunity to work with lead scientists of different disciplines and apply their methodologies to medical problems. The School has a vibrant research culture, supported by regular research meetings involving all staff and students, and much of the research activity is strongly interdisciplinary, involving for example the Schools of Physics and Biology. Clinical trials modelling is performed in collaboration with the Schools of Applied Mathematics and Computing.

The Medical School works closely with health services locally in Lothian, Fife and Tayside, and also with colleagues throughout Scotland. There are very strong international links, including on-going research collaborations in Malawi and other sites in southern Africa.

Infection remains of central importance in medicine as the leading cause of premature death worldwide. Working with partners across Europe and with the NHS locally, researchers in the medical school focus the major health priority of the evolutionary biology of antibiotic resistance, seeking to understand the factors that drive resistance and the fitness barriers that organisms have to overcome. This includes basic laboratory experimentation and research in collaboration with health service partners. This work includes studies investigating the molecular biology of the evolution of infection and antibiotic resistance in neglected area such as catheter associated urinary tract infection. Infection group faculty are engaged in national and international collaborations with an extensive network of scientists and clinicians, including: Wellcome Trust Sanger Institute MRC Clinical Trials Unit, MRC Mill Hill , as well as the Universities of Cambridge University College London Imperial College London and University of London, St Georges. Our work on translational infection, based around a solid focus of infection genomics and bioinformatics, clinical trials and experimental biology of infection is cutting edge. Infection research provides translation opportunities for our basic science colleagues in other Schools, notably Chemistry, Biology and Physics. These links involve the harnessing of photonics methodologies to identify varying cell states in bacteria. The infection group is funded by the Wellcome Trust, the European Developing Countries Clinical Trials Partnership, the Chief Scientist Office (Scotland), and the Innovative Medicines Initiative.

Research into behaviour is championed by the Child and Adolescent Health Research Unit (CAHRU) and the School hosts the WHO Collaborating Centre for International Child & Adolescent Health Policy. Close links with health psychology provide a rich environment in which interventional studies on behaviour can be undertaken, with a strong international presence, including studies on addiction and

psychosocial aspects of health. Work is funded by UK agencies, WHO and EU. There is also a strong theme that attempts the molecular dissection of genetic associations with cognitive phenotypes and neurodevelopmental disorders, using GWAS and in vivo models to dissect gene-behaviour interactions. This group has had considerable success in establishing novel sample collections through different clinical collaborators in the UK and overseas.

Systems and experimental medicine includes a strong interest in systems biology applications to medicine and the school chairs the EU funded Concerted Action on Systems Medicine Implementation in Europe (CASyM). Other funded priorities include ion channel biology and circulatory fatty acid and zinc dynamics. Using low-noise single-channel recordings, the laboratory is interested in the study of intracellularly located ion-channels that are involved in the control and regulation of Ca^{2+}-release from intracellular stores. The release of calcium from specialised stores within the cell is essential for a diverse range of biological processes and if perturbed can lead to a plethora of disease states including heart failure and neurological disorders. Medical biophotonics and optigenetics interact with numerous other groups. There are excellent tissue culture facilities, lentivirus and other gene delivery systems, experience in use of CRISPR and flow cytometry. There is good support for microscopy and ultrastructure, including digital pathology, quantitative fluorescence, image analysis and quantitative electron microscopy.