

## **SETsquared Scale-Up University Expertise Connected to Healthcare**

SETsquared universities are well positioned through their multidisciplinary life sciences and health related expertise to forge strong industrial collaborations and to benefit from funding streams within this space. Highlights of universities expertise within health include:

- **University of Bath**

- Doctoral Training Centres:
  - Medical Research Council GW4: BioMed Doctoral Training Partnership. Partnership, Bristol, Bath, Cardiff and Exeter
  - UKRI Centre for Doctoral Training in Accountable, Responsible and Transparent AI.
  - EPSRC Centre for Doctoral Training in Trust, Identity, Privacy and Security in Large-Scale Infrastructures.
- Institutes and Centres
  - Centre for Biosensors, Bioelectronics and Biodevices. Working with Abbott Diabetes Care and Oxford Instruments
  - Cancer Research at Bath. Partnership with Cancer Research UK and the Royal United Hospital, Bath
  - Neuroscience network. Work with local hospitals
  - Centre for Healthcare Innovation and Improvement. Has worked with West of England Academic Health Science Network looking into the future of social networking and healthcare
  - Research Institute for the Care of Older People. Working with the RUH. Looking into how drug treatments may be used more safely with older people and more
  - Centre for Integrated Bioprocessing Research
  - Centre for Orthopaedic Biomechanics
  - Centre for Therapeutic Innovation. Appears to already be collaborating with national and international pharmaceutical companies
  - Centre for Regenerative Medicine. Works with local hospitals.
  - The Institute of Coding. Bath is a part of it, a 33-university partnership with over 100 companies.
  - Centre for Mathematics and Algorithms for Data. Working with AstraZeneca, Bank of England, Electronic Arts, GCHQ, Shell and many more.
  - Centre for Autonomous Robotics. Working on interconnected robotic systems for use in the real world.
  - Centre for Nanoscience and Nanotechnology
  - Centre for the Analysis of Motion, Entertainment Research and Applications (CAMERA).
- Research Groups:
  - The GW4 translational Biomedical Network. Partnership between Bath, Bristol, Cardiff and Exeter. Working with the NHS.
  - Addiction and Mental Health Group
  - Clinical Rehabilitation and Exercise Medicine Research Group
  - Health Research Group
  - Drug and Target Discovery Research Group. Have worked with the University of Surrey and RenaSci and others;
  - Medical and Industrial Biotechnology Research Group;

- Medicines Design Research Group. Research often funded by the Biotechnology and Biological Sciences Research Council;
  - Numerical Analysis and Scientific Computing Research Group. Has done research on high-frequency scattering with BAE Systems, the MET Office and the Institute for Cancer Research;
  - Artificial Intelligence Research Group;
  - Mathematical foundations of Computation Research Group;
  - Human Computer Interaction Group (CREATE Lab);
  - Real and Virtual Environments Augmentation Labs (REVEAL);
  - Electronics Materials, Circuits and Systems Research Unit.
- **University of Bristol -**
    - Research Institutes - drawing together thematic, multidisciplinary research across the University:
      - Elizabeth Blackwell Institute for Health Research - building new health research communities;
      - Jean Golding Institute- making data work for everyone;
      - Brigstow Institute - researching new ways of living and being;
      - Bristol Digital Futures Institute - transforming digital innovation for a better future;
      - The University is closely linked with the University Hospitals Bristol and Weston NHS Foundation Trust and the North Bristol NHS Trust.
    - Life & Health Sciences Research Centres/ groups:
      - Bristol Heart Institute ;
      - Bristol Neuroscience;
      - Bristol Population Health Science Institute;
      - Translational Biomedical Research Centre;
      - CRUK Integrative Cancer Epidemiology Programme. Funded by Cancer Research UK;
      - Lifecourse Epidemiology and Population Oral Health Group;
      - Oral Nanoscience Group;
      - Bristol Renal;
      - Academic Respiratory Unit;
      - ReMemBr Group.
    - Digitisation Research Institutes, Centres and Groups:
      - Digital Health Research;
      - Bristol Vision Institute;
      - Visual Information Lab;
      - Smart Lab;
      - Centre for Quantum Photonics;
      - Bristol Vision Institute;
      - Quantum Engineering Technology Labs (QTEC);
      - Digital Societies;
      - Bristol Robotics Lab;
      - Engineering Systems & Design;
      - Intelligent Systems Lab.
    - Projects:
      - **Bristol Health Partners**: We are an Academic Health Science Centre. Our mission is to generate significant health gain and improvements in service delivery in the Bristol, North Somerset and South Gloucestershire region by

integrating, promoting and developing the region's strengths in health services, research, innovation and education;

- **SPHERE** The UK, like many other nations, is faced with an explosion of long-term health conditions - these are conditions that require continuous management, often for many years, outside of a hospital setting. SPHERE is a community of nearly 100 researchers, designed to tell us to what extent new technology can be answer to some of these problems;
- **HDR-UK Substantive Research Site.** Research on healthcare delivery using big data analysis of patient records based on the Bristol, North Somerset and South Gloucestershire (BNSSG) Systemwide Dataset, which for the first-time links primary and secondary care data for our population of around one million people.

- **University of Cardiff**

- Healthcare Institutes and Centres:
  - European Cancer Stem Cell Research;
  - Cardiff Institute for Tissue Engineering and Repair;
  - Cardiff University Brain Research Imaging Centre;
  - Centre for Human Developmental Science;
  - Experimental MRI Centre;
  - Marie Curie Palliative Care Research Centre;
  - Centre for Trials Research;
  - Wales Centre for Evidence Based Care;
  - Neuroscience and Mental Health Research Institute;
  - Biomechanics and Bioengineering Research Centre Versus Arthritis;
  - Wales Research and Diagnostic Positron Emission Tomography Imaging Centre;
  - Systems Immunity Research Institute.;
  - MRC Centre for Neuropsychiatric Genetics and Genomics;
  - The Research Centre for Clinical Kinaesiology;
  - Medicines Discovery Institute. Some mentions of collaborations. Prof Simon Ward <https://www.cardiff.ac.uk/people/view/972633-ward-simon>;
- Healthcare Research Groups:
  - Operational Research Group. Has collaborated with a number of university groups as well as NHS Wales to improve the interface between the mathematical research community and the medical research community;
  - Arthritis Research Group;
  - Cancer Immunology Group;
  - Cardiff Lipidomics Group;
  - Myeloid Cell Biology Group. Cardiff Health Organisation and Policy Studies Group; Cardiff Unit for Research and Evaluation in Medical and Dental Education;
  - Cardiff University Nanosome Network;
  - Contact Lens and Anterior Eye Research Unit;
  - Dementia Research Project. One of 6 UK centres;
  - Human Gene Mutation Group;
  - Macular Research Group;
  - Medical Engineering Research Group;
  - Peritoneal Immunity Group;
  - Project Sepsis;
  - T Cell Immunity Group;
  - Viral Immunology Research Group;
  - Visual Neuroscience Group;

- Chronic Lymphatic Leukaemia Research Group;
- The Advanced Therapies Group.
- Digitalisation Institutes and Centres:
  - Data Innovation Research Institute. Part of a recent grant of £10 million to unlock Wales' 5G potential;
  - Centre for Artificial Intelligence, Robotics and Human-Machine Systems
- Research Groups:
  - Data Innovation Accelerator to help companies in Wales to use their data better. The Accelerator includes Cardiff University's Data Innovation Research Institute (part of a recent grant of £10 million to unlock Wales' 5G potential) and belongs to the School of Computer Science and Informatics, alongside initiatives including Supercomputing Wales;
  - National Software Academy;
  - Visual Computing Group;
  - Advanced Research Computing Group;
  - Applied and Computational Mathematics Research Group.
- **University of Exeter**
  - Healthcare Research Centres and Institutes:
    - Centre for Biomedical Modelling and Analysis;
    - EPSRC Centre for Predictive Modelling in Healthcare. Using mathematical models to help people living with chronic health conditions;
    - Children's Health and Exercise Research Centre. Work with local hospitals
    - MRC Centre for Medical Mycology. International collaborations;
    - Institute of Biomedical and Clinical Science;
    - Institute of Health Research;
    - European Centre for Environment and Human Health;
    - Living Systems Institute.
  - Healthcare Research Groups:
    - Diagnosis of Symptomatic Cancer Optimally Group. Links with local hospitals;
    - Biomedical Engineering Group. Working closely with local hospitals;
    - Biochemistry, Chemical Biology and Structural Biology Group;
    - Human Movement Science: Biomechanics Group;
    - Epidemiology and Public Health Group;
    - Islet Biology Exeter, diabetes research;
    - NIHR Global Health Research Group;
    - Obesity and Adipose Tissue Biology Group. Closely linked with the NIHR Clinical Research Facility at Wonford;
    - Primary Care Group. Closely linked to local hospitals;
    - Medical Imaging Group;
    - Exeter Test Group, Medical School;
    - Health Statistics Group, Health Services and Policy Group, Health Economics Group;
    - Exeter Collaboration for Academic Primary Care;
    - Complex Interventions Group;
    - Microbes and Disease Group;
    - Cognitive Neurology Research Group;
    - Cell and Molecular Biology and Development Group;
    - Complex Disease Epigenetics Group;
    - Exeter Applied Neurophysiology Group;

- Exeter IBD and Pharmacogenetics Research Group;
- Molecular Genetics Groups;
- Vascular Medicine Group.

- **University of Southampton**

- **Healthcare Research Institutes and Centres:**
  - The Centre for Cancer Immunology; worked with the Oxford CRUK Centre, La Jolla Institute of Allergy and Immunology to investigate why some tumours react so well to immunotherapy;
  - Institute for Life Sciences- researchers from across the University with strategic themes focussed on Health and Medicine, Living Systems, Life Technologies and Insights through Data - includes FortisNet an interdisciplinary network of clinical, academic and industrial partners that aims to develop research, products and services that will transform musculoskeletal health;
  - NIHR Southampton Biomedical Research Centre - takes new discoveries, treatments and technologies into the clinic, using our unique tools, facilities and world-leading expertise –themes cover Nutrition, respiratory and critical care, data science, microbial science and behavioural science;
  - Wessex Institute. High-quality, practice-based research to support decision-makers in health and healthcare;
  - Southampton Cancer Research UK centre. Research strengths in Immunotherapy, Cell Biology, Medical Oncology, Surgery and Cancer Genetics;
  - The NIHR/Cancer Research UK Experimental Cancer Medicine Centre). One of 18 centres across the UK. Builds on expertise in immunotherapy;
  - Institute of Developmental Sciences covering nutrition and metabolism, regenerative medicine, genomics, epigenetics (Southampton is a partner in the EpiGen global research consortium), and periconceptional medicine;
  - NIHR Applied Research Collaboration Wessex;
  - Institute for Sound and Vibration (ISVR) alongside engineering applications ISVR undertakes fundamental work on understanding how humans hear sounds and process this information (Research Group: Signal processing, Audio and Hearing Group – including the Hearing and Balance Research Centre, Auditory Implant Centre and Audiology Clinic);
  - National Biofilms Innovation Centre –Innovation Knowledge Centre (IKC) – aims to establish a network of research and innovation capacity catalysing collaboration with industry 100+ industrial partners, 52 research partners.
- **Healthcare Research Groups**
  - The Active Living and Rehabilitation group aims to enable active living across life span;
  - The Complex Health Needs group researches how life-changing ailments impact on individuals and their families. Aims on improving the situation of those who suffer from dementia and cancer;
  - The Fundamental Care theme looks at elements of care and safety that are essential for the maintenance of health and dignity and the management of illness including bladder and bowel management;
  - Centre for Clinical and Community Applications of Health Psychology - international reputation in the development and evaluation of digital health-related behaviour change interventions for promoting health and illness management.
  - Social Networks Health and Wellbeing group (long term conditions / self-management / networks and communities)

- Southampton Clinical Trials Unit. Working in conjunction with NIHR and Cancer Research UK.
  - NIHR/Southampton Clinical Research Facility;
  - MRC Lifecourse Epidemiology Unit. Looking into Chronic Musculoskeletal disorders, Diabetes mellitus and Cardiovascular disease
  - Primary Care Research Group. Research into antibiotics, cancer, communication, mental health, supporting self-management and integrative health care;
  - Southampton Neurosciences Group (SoNG) - collaborative, interdisciplinary and applied neuroscience studying the brain and neural function in health and disease;
  - NAMRIP – Global Network for Anti-Microbial Resistance and Infection Prevention.
- Digital Healthcare Research Centres and Institutes:
    - The Centre of Excellence for the Future of Human Communication- design of digital communication tools for healthcare, such as apps for the remote monitoring of patients' health;
    - Zepler Institute - largest photonics and electronics institute in the UK – includes the Optoelectronics Research Centre and the Nanoelectronics and nanotechnological Research Group. Includes biosensors and lab-on-chip;
    - Centre for Health Technologies - a catalyst for new collaborations and partnerships between ECS and health partners/ practitioners in the areas such as e-health, healthcare technologies, wellbeing and rehabilitation;
    - IT Innovation Centre - specialises in the advancement of innovative information technologies and their deployment in industry and commerce. Including establishing digital innovation ecosystems to accelerate adoption of technologies within the health and social care system;
    - Clinical Informatics Research Unit -applied research in software development, data modelling and definitions, and develop terminology and standards; provide software and services to those engaged in clinical research to both improve quality and effectiveness, deliver healthcare innovation through informatics solutions.
  - Digital Health Research Groups:
    - The Agents, Interaction and Complexity Research Group - science and engineering of complex socio-technical, socio-economic and socio-ecological systems that underpin the most pressing challenges currently facing society including refactoring health-care systems to cope with demographic change;
    - Biomedical Electronics Research Group - electronic devices and biophysics, to the design and operation of sensors and biosensors and the research, development and production of cutting edge signal processing methods and systems.
    - Vision Learning and Control Group
    - Electronics and Electrical Engineering;
    - Advanced materials and devices;
    - Energy and power engineering;
    - Electronic systems and devices;
    - Modelling and simulation;
    - Healthcare and medical engineering; The Energy Harvesting Research Group, works with KTN;
    - The Next Generation Wireless Research Group.
- **University of Surrey**

- **Healthcare** Institutes and Centres
  - School of Biosciences and Medicine - multi-partner consortium led by the Surrey and Borders Partnership (SABP) NHS Foundation Trust to establish a digital health test bed environment;
  - School of Health Sciences-Digital health, sensors and living with cancer, Big Data Analytics, Department of Mathematics, Centre for Mathematical and Computational Biology;
  - Surrey Cancer Research Institute;
  - Real World Evidence Centre
  - Surrey Clinical Research Centre. Expertise in sleep, immunology, and vaccines;
  - Surrey Clinical Trials Unit;
  - Surrey Health Economics Centre;
  - Surrey Human Performance Institute- s a sport and exercise science facility based at Surrey Sports Park in Guildford;
  - Surrey Sleep Research Centre;
  - Centre for Nursing and Midwifery;
  - International Care Ethics Observatory;
  - Centre for Biomedical Engineering;
  
- Health Research Groups:
  - Clinical Informatics. Working with hospitals.
  - Targeted Cancer Therapy Research Group- clinical trials, biobanking and novel cancer treatments
  - Cancer Clinical Academic Group.
  - Cardiovascular Clinical Academic Group.
  - Critical Care Clinical Academic Group;
  - Diabetes Clinical Academic Group;
  - Mental Health Clinical Academic Group;
  - Primary Care Clinical Academic Group;
  - Sleep Clinical Academic Group;
  - Brain and Behaviour Research Group. Collaborative. No direct mention of partners but has worked with individual companies on research projects;
  - Clinical Intervention and Practice Research Group;
  - Health Psychology Research Group;
  - Cancer Research Cluster;
  - Acute, Critical and Emergency Care Research Cluster- include health research into digital health, workforce wellbeing, cancer, long-term conditions, and family health;
  - Long-term Conditions and Aging Research Cluster;
  - Maternal and child-health Cluster.
  
- Digital Health Institutes and centres:
  - Advanced Technology Institute - nanomaterials, advanced materials and quantum information;
  - Nanoelectronics Centre;
  - Department of Electronic and Electrical Engineering, the Centre for Vision, Speech and Signal Processing- machine learning methods for healthcare systems and dementia.
  - Nature Inspired Computing and Engineering Group;
  - Functional Nanomaterials group. Focus on nano-processing.

Institute for Communications Systems- cognitive networks, IoT deployments and sensor data-based knowledge generation