

## Intrastructure and facilities



The College has a continuously evolving but strategically-focused estates development approach, systematically co-located groups according to research themes, rather than departmental alliance, and in new or refurbished high quality space to enhance research productivity.

The key building blocks of this are:

### The Institute of Biomedical Research (IBR)

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The Institute of Biomedical Research (IBR), a £30m JIF-funded facility opened in 2004 which houses laboratory-based research groups including the MRC Centre for Immune Regulation. It includes a technology hub, state of the art imaging and laboratories for Category 3 microorganisms. Since 2008 the IBR has been extended into contiguous, high quality space in the Medical School. This substantial investment has increased our basic science laboratory space by 3000m<sup>2</sup> and allowed us to co-localise research groups working on DNA repair and epigenetics and various aspects of tissue repair and regeneration.

### Key cancer research groups and the CRUK Clinical Trials Unit

Key cancer research groups and the **CRUK Clinical Trials Unit** (</research/activity/mds/trials/crctu/index.aspx>) (CRCTU) are located in contiguous buildings at the west end of the Medical School campus. Since 2008 substantial investment has provided high quality accommodation for the CRCTU allowing the unit to extend its portfolio of academic trials and thereby to increase income to sustain future developments.

The CRCTU is the largest cancer trials unit in the UK (134 staff) with expertise in late phase trials, development of novel therapeutics and biomarkers in clinical trials. In 2009 the CRCTU was awarded core funding to become the UK's designated clinical trials unit for paediatric malignancies. CRCTU has recruited 4478 patients into 56 trials since 2008. The CRCTU also hosts the NIHR BRU in Liver Disease extending expertise in early phase trials in cancer into non-malignant diseases an example of how we disseminate skills to maximise delivery.

The **NIHR Experimental Cancer Medicine Centre** ([http://www.nihr.ac.uk/infrastructure/Pages/Experimental\\_Cancer\\_Medicine\\_Centres.aspx](http://www.nihr.ac.uk/infrastructure/Pages/Experimental_Cancer_Medicine_Centres.aspx)) (ECMC) focuses on early phase translational activity and includes a paediatric ECMC at Birmingham Children's Hospital leading childhood phase 1/2a trials. The Centre for Clinical Haematology, built with Regional Development Agency funds in 2011, houses the national Leukaemia and Lymphoma Research Therapy Acceleration Programme. Coordination of national trials activity through the TAP has greatly increased recruitment and income allowing us to expand the Centre into adjacent space to increase capacity.

### The Institute for Microbiology and Infection

The **Institute for Microbiology and Infection** (<http://www.birmingham.ac.uk/research/activity/microbiology-infection/index.aspx>) opened in 2011 in refurbished laboratory space in the Biosciences building, co-locating microbiologists and immunologists from the Schools of **Biosciences** (</schools/biosciences/index.aspx>) and **I&I** (</schools/immunity-infection/index.aspx>). This helped to maximise synergy and collaborations and already resulted in a substantial increase in grant funding in support of sustainability.

### The NIHR/Wellcome Trust Clinical Research Facility

The **NIHR/Wellcome Trust Clinical Research Facility** (</facilities/crf/index.aspx>) (NIHR WT CRF) based at both University Hospitals Birmingham and Birmingham Children's Hospital provides high-quality clinical environments for experimental and complex research studies in an 'ageless' approach.

It was established in 1999 as one of the original Wellcome Trust Millenium facilities. A subsequent £10M Clinical Research Initiative Award from the Wellcome Trust, Wolfson Foundation and DoH funded an extension into the new QEH, a dedicated Gene & Immunotherapy facility and the first paediatric facility in the UK at BCH. In 2012 it received the largest NIHR CRF award nationally (£12.5M) to fund the running of the facility until 2017.

The **CRF Health Research Bus** (</facilities/health-research-bus/index.aspx>) is a unique mobile research facility containing state-of-the-art clinical research equipment and a laboratory that allows studies to be done in the community. Since 2001 the NIHR-WT CRF has studied over 70,000 patients in more than 350 studies. As part of a national CRF network it promotes collaboration between CRFs and hosts conferences and workshops. Since 2008 two major new developments linked through shared governance to the CRF have expanded our translational research capability:

### The Human Biomaterials Resource Centre

The **Human Biomaterials Resource Centre** (</facilities/hbrc/index.aspx>) (HBRC) established with Regional Development Agency funding is one of the first Human Tissue Authority licensed tissue biorepositories. The involvement of senior pathologists ensures material of high quality and linkage to appropriate clinical data.

Biobanking is facilitated by standardised collection procedures, generic ethics and consent that apply to all of our affiliated hospitals, allowing comprehensive recruitment from our large and diverse population base. Projects are assessed by a scientific advisory committee without need for additional ethics approval thereby streamlining governance for the individual researcher.

This powerful platform provides a national resource accessed by researchers throughout the UK, e.g. as a component of CRUK Clinical Hubs and an EU Innovative Medicines Initiative for stem cell research.

### The Advanced Therapies Facility

The Advanced Therapies Facility (ATF) (opened 2013) provides state of the art cell and gene therapy suites integrated into the CRF with pharmacy facilities designed for

gene, cell and biological therapies and “hatchery space” to co-locate academics and companies to develop commercial ideas. ATF projects have already attracted substantial funding from EU, MRC and NIHR suggesting the facility will be sustainable.

## The Centre for Translational Inflammation Research

The Centre for Translational Inflammation Research (CTIR) opened in 2011 within the new Queen Elizabeth Hospital. This purpose-built facility brings together researchers working on mechanisms of inflammation biology with NHS clinicians and patients, providing high specification lab facilities as well as an integrated satellite of the NIHR WT CRF, a powerful platform for translation and experimental medicine in patients with chronic inflammatory disease.

We have developed a strong relationship with the Ministry of Defence and the Royal Centre for Defence Medicine at UHB. This has helped to secure the NIHR Surgical Reconstruction & Microbiology Research Centre allowing us to carry out trauma research in both the civilian and military context, supported by Ministry of Defence funded PhD students.

### Research Facilities and equipment

- **The Technology Hub (<http://mymds.bham.ac.uk/TECHNOLOGYHUB/>)** was set up in 2008 to bring together key technology platforms (next generation sequencing, high speed cell sorting, protein and antibody production, imaging and transgenic services) into a single structure to improve management, access, support and training. This structure allows us to plan replacement and facilitates investment in new technologies, including through the University Research Technologies and Infrastructure Coordination Group, which provides match funding for equipment requests associated with peer-reviewed grant applications and funds strategic investment in multi-user equipment facilities. The Technology Hub also links into M5, which is a group of Midlands universities (Birmingham, Leicester, Loughborough, Nottingham and Warwick, and Aston) that is exploring how to boost research collaboration and improve sharing of equipment.
- **The Henry Wellcome Building for Biomolecular NMR Spectroscopy (</facilities/nmr/index.aspx>)** (renewed in 2012) is a national resource with open access to six NMR spectrometers operating at 500-900 MHz, four cryogenic probes and high throughput autosamplers.
- **The Birmingham University Imaging Centre (<http://www.buic.bham.ac.uk/>)** (BUIC) is a state-of-the-art brain MRI capability including stimulus delivery, eye tracking and limb movement recording and transcranial magnetic stimulation (TMS) with 64 channel simultaneous EEG recording. Cardiology and liver developments are facilitated through the NIHR BRU funded 3T clinical research MRI, based at the QEH.
- The Systems Science for Health (SSfH) initiative was launched in 2010 with £1M of University investment across 3 Colleges to coordinate expertise in metabolomics, analytical and computational workflows. The award of a prestigious Technological Alliance Partnership with Thermo Fisher Scientific in 2013 provides access to new technologies, scientists and engineers enhancing existing facilities including Translational Steroid Metabolomics and the Biosciences Advanced Mass Spectrometry Facility.
- The Birmingham United Molecular Pathology (BUMP) unit established 2012 is one of three national Technology Hubs which sequence tumours collected through the CRUK-funded Stratified Medicine Clinical Hubs centred on the Birmingham ECMC and HBRC underpinned by two Technology Strategy Board stratified medicine awards.
- **The Clinical Immunology Service (</facilities/clinical-immunology-services/index.aspx>)** has developed deep immunophenotyping to stratify patients with blood cancers and identify the basis of complex secondary immunodeficiencies. Such coupling of research with clinical diagnosis improves clinical practice, attracts income for future developments and provides unique research opportunities.

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