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2 College overview and structure

The [College of Medical and Dental Sciences](#) (MDS) is the largest of the University’s five Colleges with over 1,700 members of staff ensuring teaching and research excellence across a wide range of pre-clinical and clinical disciplines.

The College is structured into eight Institutes:

- [Institute of Applied Health Research](#)
- [Institute of Cancer and Genomic Sciences](#)
- [Institute of Cardiovascular Sciences](#)
- [Institute of Clinical Sciences](#)
- [Institute of Immunology and Immunotherapy](#)
- [Institute of Inflammation and Ageing](#)
- [Institute of Metabolism and Systems Research](#)
- [Institute of Microbiology and Infection](#)

Our Institutes are focused academic units in identified areas of high-performing research and teaching excellence, each with an ambitious strategy and empowered leadership. We draw



together outstanding academic, clinical and professional services staff around coherent and highly collaborative themes.

Professional services

A diverse range of committed and high-performing professional services staff, managed through integrated College-wide teams, underpin and provide support to the establishment, development and delivery of all aspects of the College's activity. They support academic staff and students and provide core functions and support services in addition to delivering specialist technical services.

The model of central management with localised focus and delivery provides flexible, high-quality support according to academic need. The teams operate in close and effective partnership with colleagues across campus and in the NHS.

College location

The principal base of the College is part of the main campus of the University in Edgbaston, co-located with Queen Elizabeth Hospital Birmingham, and with a number of other key buildings both on and off-campus, including the Birmingham Dental Hospital and School of Dentistry at Pebble Mill, just a mile from the central campus.

Other NHS Trust partners are also on the same campus, including Birmingham Women's Hospital and the Barberry Hospital.

3 University of Birmingham Life Sciences Strategy

The Life Sciences Strategy (LSS) was developed following detailed engagement both internally and externally. The LSS identifies priorities in areas relevant to human health for the University as an outstanding, distinctive centre for [Life Sciences research](#) and education, including clinical and biomedical sciences and human biology.

The LSS is focused on building multidisciplinary research and teaching activities across the whole campus. It will help to deliver the region's ambition to establish Birmingham as one of the UK's pre-eminent locations for the Life Sciences sector delivering improved healthcare, economic growth and making the UK the best place to invest in life sciences research.



Integral to the delivery of the LSS is [Birmingham Health Partners](#) (BHP), a strategic alliance between the University and two major NHS hospital trusts; the Shelford Group member University Hospitals Birmingham NHS Foundation Trust and Birmingham Women's and Children's NHS Foundation Trust. BHP's mission is to harness research strengths in the University and NHS to deliver better treatments and care to patients.

4 Research

With over 1,100 academic staff and around £80 million new research funding per year, MDS represents a major international centre for biomedical and health research.

Our overall research objective is to develop and promote excellence in basic and clinical science with an ultimate goal of delivering improvements in human health. We take pride in a truly translational pipeline, delivering cutting edge clinical trials and patient studies, underpinned by cell and molecular biology research on both model organisms and humans.

Our research is supported by peer-reviewed multi-million-pound funding from a broad range of funders, including UK Research and Innovation, medical research charities such as Wellcome, Cancer Research UK, Bloodwise, Versus Arthritis and the British Heart Foundation as well as the National Institute for Health Research and the European Union.

This is complemented by strategically important support from other government bodies (such as Birmingham City Council, the Greater Birmingham and Solihull Local Enterprise Partnership, the Department for Business, Energy & Industrial Strategy, the Department of Health, the Office for Life Sciences) and increasing funding from industrial partners including large pharmaceutical companies (e.g. GSK and Roche) and SMEs (e.g. Vital Therapies).

- The University of Birmingham was ranked in the top 75 universities worldwide for Clinical Medicine in 2018 by the Academic Ranking of World Universities, also known as the Shanghai Ranking.
- It was ranked in the top 100 universities by the QS World University Rankings 2019 for Medicine

With an average field weighted citation impact of 2.30 for medical and dental sciences our research is truly world-leading and over 25% of our publications appear in the top 10% cited



papers worldwide. Our collaborative ethos and the multi- and inter-disciplinary nature of our research are highlighted by the fact that over 75% of our publications are developed in collaboration with national and international partners.

5 Our Institutes

Our Institutes are responsible for driving the further development and delivery of priority themes identified in the LSS and the [College's Strategic Framework](#). They are championing interdisciplinary collaboration across the University's Colleges and in partnership with our regional NHS Trusts. Each Institute contributes to our translational pipeline, supporting fundamental research excellence through to clinical and applied health programmes.

This strategy ensures that our research delivers real impact in health and wealth generation and that our educational programmes are informed by our research strengths. Co-location and core focal points for each of the Institutes ensure cohesion, while at the same time promoting cross-Institute working and collaboration.

This is further enabled through access to key College and/or cross-campus-managed facilities and resources and the provision of high quality professional services support including core academic, technical and specialist administration in support of teaching and research delivery.

Institute of Applied Health Research

The [Institute of Applied Health Research](#) is focused in two broad areas: primary care and population health research, and healthcare evaluation and methodology.

There is expertise in the main community focused clinical disciplines of public health, primary care and occupational medicine. Methodological expertise encompasses biostatistics, health economics, clinical trials, evidence synthesis, patient reported outcomes, epidemiology, health psychology and qualitative research.

The Birmingham Clinical Trials Unit (BCTU) is internationally renowned and delivers both specific discipline related research and provides an exceptional collaborative framework for developing and delivering translational outputs from the University's wider research portfolio.



The Institute also hosts the £2 million NIHR Global Health Research Group on Global COPD in Primary Care, which is aimed at improving healthcare for patients with lung diseases around the world.

The Centre for Patient Reported Outcome Research optimises the use of patient reported outcomes in clinical trials and routine care, to improve service delivery, enhance patient care and outcomes and ensure that the patient perspective is at the heart of health research and NHS decision-making.

The Institute also hosts researchers aligned to the NIHR Research Design Service West Midlands, the NIHR Collaboration for Leadership in Applied Health Research and Care and the NIHR Clinical Research Network.

Institute of Cancer and Genomic Sciences

The [Institute of Cancer and Genomic Sciences](#) represents our major academic strengths in fundamental cancer research, particularly in clinical cancer genomics and bioinformatics, genome biology, viral oncology, stem cell biology, haematology, surgery (colorectal, head and neck, gynaecological and neurology) as well as cancer clinical trials.

The latter of these is driven through our [Cancer Research UK Clinical Trials Unit \(CRCTU\)](#), which is the national lead for paediatric cancer trials. We also host the CRUK Birmingham Centre, receiving £5 million in 2017 to enable new treatment approaches to be developed and made available to patients, with a focus on personalised medicine to meet individual patient needs.

Additional key infrastructure includes the Birmingham Centre for Genome Biology, the cross-College Centre for Computational Biology and an NIHR-CRUK Experimental Cancer Medicine Centre (ECMC). The success of our academic haematology has provided a model for the development of the Bloodwise-funded Trials Acceleration Programme (TAP).

We also lead the Centre for Rare Disease Studies and are the academic partner of the West Midlands Genomic Medicine Centre (WM GMC), the largest GMC in the UK and linking all 18 regional NHS Trusts with academic leadership based within this Institute.

The Institute also hosts the recently awarded £7 million NIHR Global Health Research Unit on Global Surgery, which will establish sustainable international research hubs across a range of low and middle income countries.



Institute of Cardiovascular Sciences

Our [Institute of Cardiovascular Sciences](#) is focused around two key themes: vascular inflammation, thrombosis and angiogenesis, and clinical and integrative cardiovascular sciences. Major awards centre on the regulation of platelet and leukocyte responses in vascular diseases, and the pathogenesis of cardiac diseases particularly atrial fibrillation.

With a BHF Chair and a number of senior BHF Fellows, this is a cluster of collaborative activity that champions interdisciplinary working through partnerships, such as the Engineering and Physical Sciences Research Council (EPSRC) Physical Sciences for Health integrated Centre for Doctoral Training and the NIHR Surgical Reconstruction and Microbiology Research Centre (SRMRC).

The Institute is leading the joint Universities of Birmingham-Nottingham research centre, the Centre for Membrane Proteins and Receptors (COMPARE), which is developing novel methods for visualising and studying membrane proteins with a particular focus on cardiovascular disease, and also the Midlands Cardiovascular Research Network.

Institute of Clinical Sciences

The [Institute of Clinical Sciences](#) consists of a number of Schools dedicated to the delivery of research and education, including:

- [Birmingham Medical School](#)
- [School of Pharmacy](#)
- [School of Nursing](#)
- [School of Biomedical Sciences](#)
- [School of Dentistry](#)

Benefitting from a highly interdisciplinary approach, it works closely with all other College Institutes to ensure delivery of teaching excellence and high quality research outputs. Some of the main focusses of research within the Institute include:

- Dentistry – Research in the School of Dentistry is focussed into two overarching themes: clinical and experimental oral sciences and regenerative and rehabilitative science.
 - The School of Dentistry was ranked 13th in the 2019 QS World University Rankings and 11th in the Complete University Guide 2020
- Nursing – Research is organised in three themes: risk, violence and abuse, end of life care, and organisation and delivery of services



- The School of Nursing was ranked 7th in the Complete University Guide 2020
- Our Nursing programme was ranked 10th in the Guardian University Guide 2020
- Pharmacy – The principal pharmacy research themes are multi-disciplinary in the areas of drug discovery and development, pharmaceutical formulation and delivery, and clinical pharmacy practice.
 - Pharmacy was ranked 11th in the Complete University Guide 2020
 - Our Pharmacy programme was ranked 10th in the Guardian University Guide 2020

Institute of Immunology and Immunotherapy

The [Institute of Immunology and Immunotherapy](#) builds on the longstanding tradition of research in immunology at the University.

The Institute hosts the £12 million NIHR Birmingham Biomedical Research Centre (BRC), which provides improved therapies for a range of inflammatory conditions affecting gut, liver, joint and muscle tissues, and the internal Centre for Liver and Gastrointestinal Research.

The CRUK Birmingham Centre, jointly hosted with the Institute of Cancer and Genomic Sciences, brings together scientists and clinicians to catalyse fundamental discovery science in cancer and novel therapeutic developments originating from this research.

Our Clinical Immunology Service supports a range of national cancer trials, and led a £7.3 million MRC Clinical Infrastructure award to provide ‘deep’ immunophenotyping of patients.

The Institute also hosts the £2.2 million Bacterial Vaccines (BactiVac) network, which accelerates the development of vaccines against bacterial infections relevant to low and middle-income countries. It is the first network of its kind to focus specifically on bacterial infections.

Institute of Inflammation and Ageing

Our [Institute of Inflammation and Ageing](#) benefits from a highly collaborative leadership team focused on translational outputs, based within a dedicated wing of the Queen Elizabeth Hospital Birmingham.

The strength of the Institute’s vision is represented by a number of major national awards, as well as our key role in the NIHR Translational Research Collaboration (TRC) in joint and related inflammatory diseases:



- MRC-Arthritis Research UK Centre for Musculoskeletal Ageing Research (with Nottingham University)
- Rheumatoid Arthritis Pathogenesis Centre of Excellence (with the Universities of Glasgow and Newcastle)
- Arthritis Research UK Experimental Arthritis Treatment Centre
- NIHR Surgical Reconstruction and Microbiology Research Centre (SRMRC)
- NIHR Trauma Management MedTech Co-operative
- The Scar Free Foundation Centre for Conflict Wound Research
- The Scar Free Foundation Birmingham Burns Research Centre

The Institute leads themes within the NIHR Birmingham BRC; the inflammatory joint disease and inflammatory sarcopaenia themes are led by researchers in the Institute and lead programmes to better understand a range of debilitating inflammatory diseases for patients in Birmingham and beyond.

A £7 million investment from the Kennedy Trust for Rheumatology Research has also supported a new partnership with the University of Oxford to accelerate the development and testing of new therapies for patients with arthritis – the Arthritis Therapy Acceleration Programme.

Institute of Metabolism and Systems Research

The [Institute of Metabolism and Systems Research](#) offers a highly multi-disciplinary collaborative environment that combines leading excellence in metabolism, endocrinology and reproduction research with world class expertise in metabolome analysis, live cell imaging, model-based and human in vivo physiology and computational systems science approaches.

The Institute drives strategic leadership for the University of Birmingham Metabolomics Core, which comprises a unique cluster of capacity and expertise for metabolome analysis, delivered by the Phenome Centre Birmingham (£7.3 million MRC Clinical Infrastructure award), the Steroid Metabolome Analysis Core, the Metabolic Tracer Analysis Core and the Henry Wellcome Biomedical Nuclear Magnetic Resonance Facility.

Institute researchers drive key components of COMPARE, developing novel methods for visualising membrane proteins for prevention and treatment of disease.



The Institute's science is translated into health facilitated by a number of translational centres, including the Centre for Endocrinology, Diabetes and Metabolism, the Centre for Women's and Newborn Health and the £5 million Tommy's National Centre for Miscarriage Research, alongside key contributions to the MRC-ARUK Centre for Musculoskeletal Ageing and the NIHR Birmingham BRC.

Institute of Microbiology and Infection

The [Institute of Microbiology and Infection](#) draws together one of the largest groups of academic expertise in this area nationally and internationally. The Institute's staff are expert microbiologists, immunologists, biochemists and chemists, with technical expertise in next generation sequencing, genomics, proteomics, molecular and structural biology, biotechnology and modelling.

Diverse research programmes encompass fundamental science of model organisms to the biochemical and biophysical analysis of microbial components to translational research on key pathogens of medical and veterinary importance. Major interests include pathogenomics, chromosome architecture and gene regulation, plasmids and mobile DNA, physiology and adaptive response, cell wall structure and membrane proteins, pathogenesis and host-pathogen interactions, infection and host-immune response, antibiotic and antimicrobial resistance and environmental biotechnology.

The Institute is supported by two Wellcome-funded PhD programmes, the NIHR SRMRC, the MRC Cloud Infrastructure for Microbial Bioinformatics and the Biotechnology and Biological Sciences Research Centre (BBSRC)-supported MicrobesNG, a national platform for microbial genome sequencing and strain repository.

6 Education

Each year the College trains more than 400 medical students, including a Graduate Entry cohort. Nearly one third of our medical students intercalate on a choice of programmes after the second, third or fourth year of their course. We also train 71 dental students, 23 biomedical materials science students, 160 biomedical science students, 160 nursing students, 70 pharmacy students and 60 physician associate students.



There are also approximately 700 postgraduate taught students and 500 postgraduate research students in the College, managed by a cross-College Graduate School. The College has excellent library and reference facilities, including the Barnes library and Doug Ellis Learning Hub, which complement the wider facilities available to students on campus.

The Institute of Clinical Sciences provides a clear focus for integrating our education and training programmes, co-ordinating all teaching, student engagement and related activity across the College to deliver a high quality student experience. The Institute also supports increased recognition of the value of education and teaching contribution through an enhanced emphasis on pedagogy.

We are committed to providing students from all backgrounds with the opportunity to discover education and research in biomedical sciences and healthcare. We deliver a range of widening participation activities to bring students onto campus allowing them to explore what it is like to be a student at our University while giving them an insight into the courses they could study here and the pioneering research underpinning them; almost 3,500 students have received support from our extensive widening participation activities over the last 10 years and around 15% of our medicine intake is now from under represented backgrounds.

Our employability rates within the College are excellent, with some notable alumni in influential positions all around the world.

Highlights from the 2018 National Student Survey included:

- 98% of our Pharmacy students said they were satisfied with the teaching on the course
- 95% of our Nursing students said they were satisfied with the teaching on the course
- 91% of our Biomedical Science students said they were satisfied with the teaching on the course

7 Working in partnership

Birmingham Health Partners

Our partnership working with regional NHS Trusts is very strong, as exemplified by [Birmingham Health Partners \(BHP\)](#), an exciting collaborative platform between the University, University



Hospitals Birmingham NHS Foundation Trust and Birmingham Women's and Children's NHS Foundation Trust.

BHP has an outstanding healthcare infrastructure based on a campus that encompasses renowned hospitals, world-class multi-disciplinary research facilities, clinical and industry-focused space and a range of flagship national centres of excellence. Globally Birmingham is one of the few cities that can deliver such comprehensive co-located expertise.

The co-location of the partners allows BHP to deliver an integrated approach to research and healthcare innovation; working together to shape the future of healthcare to benefit our communities and change lives.

BHP leads one of six new sites across the UK created to address challenging healthcare issues through use of data science, funded by £30 million from Health Data Research UK. The University of Birmingham and University Hospitals Birmingham NHS Foundation Trust form part of the Midlands site, together with the Universities of Leicester, Nottingham and Warwick.

Research centres and facilities

The [Advanced Therapies Facility](#), incorporating the Cell Therapy Suite, Human Biomaterials Resource Centre and Microbiome Treatment Centre, works with a large number of NHS Trusts in the region and acts as the hub for collaborative initiatives such as the 100,000 Genomes Project WM GMC.

The WM GMC draws upon our unique population demographic through a collaboration of 18 NHS Trusts co-ordinated by our partnership with the West Midlands Academic Health Science Network (WMAHSN). The WMAHSN brings together NHS commissioners, providers of NHS services, industry, academia and representatives of the people of the West Midlands to support the spread and adoption of innovation across the region.

The £9 million [Midlands and Wales Advanced Therapy Treatment Centre](#) (MW-ATTC), formed in March 2019, is a health consortium jointly led by the NIHR Birmingham BRC and NHS Wales to ensure more patients benefit from a new generation of breakthrough therapies.

Collaborative projects and opportunities

We also partner with many other Universities both in the UK and overseas on collaborative research projects and split site PhD opportunities. These collaborations maximise our research



outputs, and provide PhD students with opportunities to broaden their knowledge and skills across multiple world leading institutions; projects with international partners include a large number of Horizon 2020 awards and specialist strategic collaborations with partners, including Universitas 21 and Sun Yat Sen University, China.

NHS Trusts and practices

In addition to the NHS Trusts in our immediate vicinity, the College works closely with many of the teaching hospitals, clinical commissioning groups (CCGs) and training practices across the West Midlands. Students are encouraged to broaden their knowledge and experience by working across a wide range of organisations and experiencing the varied cultures and demographics of the West Midlands.

We have particularly strong research links with Sandwell and West Birmingham Hospitals NHS Trust, which hosts much of our clinical academic work in rheumatology, ophthalmology and cardiology.

Cross-campus collaboration

Our cross-campus collaborations within the University are vital, to share expertise and knowledge across disciplines, as well as facilities, equipment and resources. We have strong relationships with all other University Colleges, most notably with the College of Life and Environmental Sciences in connection with the Life Sciences Strategy as outlined above.

Other strong links are with the Business School, within the College of Social Sciences for education delivery, and with the College of Engineering and Physical Sciences for both teaching and research activity where programmes in biomaterials, regenerative medicine and biomathematics are particularly exciting. We are also looking to forge stronger links with the College of Arts and Law in areas that include medicolegal and medical ethics and the use of the arts to engage and treat patients.

Clinical academic roles

Appointment to a clinical academic role will require the appropriate level of honorary contract to be held with the NHS or other partner body. The organisation awarding an honorary contract will expect the pre-employment checks such as DBS, occupational health clearance and right to work to have been undertaken by the University before awarding an honorary contract.



8 Facilities

The University continues to invest in resources and research facilities to ensure that our academic staff and researchers are able to pursue their research and educational ideas in an outstanding and facilitatory environment. Cross-College enabling technologies platforms support and strengthen our research in key areas including sequencing, mass spectrometry, whole organism and cell imaging, cell sorting and flow cytometry and NMR based metabolomics and structural biology. This is supplemented within the College by our protein expression, genome editing and intra-vital imaging facilities.

- [Our research facilities](#)

Medical School building and Institute of Biomedical Research

Within the Medical School building teaching facilities include the 450-seat Leonard Deacon lecture theatre and the 398-seat Arthur Thompson hall, dedicated practical teaching spaces for pharmacy, anatomy and clinical skills and a prosectorium incorporating 10 ventilated tables and high tech AV teaching aids.

The Med Café and Wolfson Common Room provide our students, staff and visitors ample space to interact in a less formal environment while still providing facilities to promote group working.

Our research laboratories are accommodated across several buildings with a large concentration of these in the Institute of Biomedical Research complex where they are arranged to promote collaborative working with access to the Advanced Therapies Facility and the NIHR Birmingham Clinical Research Facility.

Institute of Translational Medicine

The £24 million [Institute of Translational Medicine \(ITM\)](#), which sits between the College and University Hospitals Birmingham NHS Foundation Trusts, was co-funded by the former Department for Business, Innovation and Skills and BHP.

It is an innovative development bringing together world class clinicians, scientists and clinical trials teams to accelerate access to new diagnostics, drugs and medical devices thereby enabling patients to benefit more rapidly from breakthrough therapies and technologies.



The ITM incorporates the BHP Centre for Rare Diseases, the NIHR Trauma Healthcare Technology Co-operative, the Medical Devices Testing and Evaluation Centre led by the College of Engineering and Physical Sciences, a new early-phase trials team and a commercial hub to host pharmaceutical companies and SMEs.

It provides excellent facilities for interaction between different specialities; informatics, the ARUK-MRC West Midlands stratified medicine facility, the Centre for Patient Reported Outcomes, biomarkers analysis, and clinical trials design all have a strong presence along with the NIHR Birmingham BRC, CRUK Birmingham Centre and the NIHR SRMRC.

Further facilities

The [Phenome Centre Birmingham](#) is a large metabolic phenotyping facility led by internationally-recognised metabolomics and clinical experts at the University in collaboration with BHP. It has been established as part of a UK Stratified Medicine initiative led by the MRC to develop capacity and capability to perform large-scale metabolic phenotyping of the human population for stratified medicine. The Centre, along with additional facilities, including the ITM laboratory, were funded through the University's £7.2 million MRC Enhancing UK's Clinical Research Capabilities and Technologies award and Wolfson, bringing technology and infrastructure to design and deliver novel precision medicine trials.

The [BioHub Birmingham](#) is also co-located on campus within the Birmingham Research Park. This £6.8 million facility offers fully serviced laboratory and office space for growing Life Sciences businesses. Just 500 metres from the ITM, it supports a growing portfolio of medical spin-out companies from the University and other local growing businesses.

2015 saw the opening of the new £50 million [Birmingham Dental Hospital and School of Dentistry](#). The hospital and school, at Pebble Mill, is the first integrated, stand-alone dental hospital and dental school to be built in the UK for almost 40 years and provides a superb facility for dental research, teaching and practice.

Investment into the University estate continues across campus, with an ambitious programme of development underway, including targeted investment to further develop and maintain the College teaching and research estate.



Finally, the College is also taking a leading role in establishing a new [Birmingham Life Sciences Park](#) (BLSP) adjacent to the University. BLSP will build on BHP's vision to deliver research that matters as part of an exciting regional and national life sciences strategy. It will bring together outstanding researchers, clinicians, policy makers and industry to rapidly translate scientific and clinical insights into patient benefit and economic growth. It will reinforce Birmingham's ability to support innovative and pioneering partnerships that build on the strong existing collaborations.

Our outstanding facilities and strong ethos of partnership working, combined with multi-disciplinary academic excellence across the University and a diverse regional population of over five million mean that Birmingham is ideally placed to occupy a world-leading position in the rapidly evolving Life Sciences sector.

9 Equality and Diversity

Promoting equality and diversity is at the heart of the College's strategic vision and an issue that the College Board takes very seriously. The College's equality and diversity leadership team drives and embeds behavioural and cultural change throughout the College.

This is carried out through promoting staff and student diversity activities, signposting staff and students to appropriate policies and services, exploring equality related barriers that may hinder any member of staff or student being successful, providing scrutiny for policy and strategy development and implementation, and providing an advocacy role as and when required for implementation of policy and delivery of plans.

The College was awarded an Athena SWAN Bronze award in October 2018 in recognition of progress made in furthering the recruitment, retention and progression of female academic staff. The College has delivered a comprehensive and innovative range of activities, refreshed and changed policies and taken practical steps to improve the working environment.

The College is piloting provision of technical support for clinical trainees during maternity leave. A fund is also available to help with childcare costs during conferences and a budget is set aside annually to fund SWAN events. Staff can access a range of leadership opportunities and are offered grant workshops and fellowship interview practice. Events and developments are listed online and a [video](#) outlines how SWAN activities can help colleagues in the College.



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