Newcastle University
Scientific Facilities
At Newcastle University our world-class research is underpinned by our excellent Research Facilities.

Our Scientific Facilities are technology-based laboratories which offer users the ability to access sophisticated, state of the art equipment, while their talented and highly experienced technical staff provide essential support, expertise and knowledge.

Facility staff are able to work closely with researchers, offering a holistic service with the aim of providing the tools researchers need to perform their work at the cutting edge of their research field, and enabling outstanding research outcomes.

Our facilities provide the added value of partnerships throughout the research lifecycle.

Expert advice and input can be provided at all stages, including: developing experiments; sourcing, purchasing and maintaining cutting-edge technologies, and operating these technologies to their maximum potential; and the analysis and interpretation of complex data sets.

www.ncl.ac.uk/research/facilities
research.facilities@ncl.ac.uk
As well as supporting researchers at Newcastle University, our Scientific Facilities welcome enquiries from commercial customers and other academic and healthcare institutions.

We can provide:
- access to our facilities and equipment
- analytical and testing services
- expertise and specialist support
- training

Please get in touch with the facilities’ specialist staff who can discuss your requirements.

If you are not sure which facility would best suit your needs, please contact us for advice.

www.ncl.ac.uk/research/facilities
research.facilities@ncl.ac.uk
The Newcastle Biobank Facility offers training and technical advice, alongside a range of services tailored to individual requirements:

- HTA-compliant sample storage
  - Temperature-controlled, monitored storage facilities for human samples

- Sample processing, including:
  - Blood Separation
  - Nucleic Acid Extraction

- Histology services, including:
  - Specimen processing and embedding
  - Tissue sectioning (microtomy/cryotomy)
  - Histological staining

- Digital pathology service
  - High throughput capacity slide scanning, with input from Clinical Pathologists

- Provision of samples
  - Access to specimens from research tissue banks and diagnostic archives
  - Sample collection services to facilitate research projects
Our mission is to facilitate innovation across a broad range of biological research fields by providing access to cutting-edge microscopy, imaging equipment and expertise.

Imaging technologies available:
- Brightfield, phase and DIC microscopy
- Widefield fluorescence microscopy
- Confocal and multi-photon microscopy
- Light-sheet imaging
- Super resolution microscopy
- ‘High-content’ confocal screening

Image analysis:
- Commercial software: Volocity (PerkinElmer), Imaris (Bitplane), NIS Elements (Nikon), Huygens Suite (SVI), Columbus (PerkinElmer)
- Open-Source software: ImageJ / Fiji, Cell Profiler, ICY

Access & Training:
- Training: individual or small group training sessions
- Access: 24 hours 7 days a week (internal and external customers)
- Support models: autonomous; assisted acquisition; and contract (we perform the imaging and analysis for you)
Bioinformatics

Data analysis for life sciences through collaboration, analytical services and training.

The Bioinformatics Support Unit has extensive analytical expertise of high throughput biological data, particularly:

- Sequencing
- Microarrays
- Proteomics
- Flow/Mass Cytometry

Depending on individual needs, our experienced staff can work with you in collaboration, or provide analysis as a service.

We are happy to provide support and advice across the research lifecycle, from study design, through to data analysis and manuscript preparation. Come and talk to us about your research plans.

In addition to our analysis services, we also provide training through regular courses and bespoke training options in all aspects of bioinformatics.

www.ncl.ac.uk/bsu
bsu-support@ncl.ac.uk
BioScreening Facility

An established facility offering a bespoke screening service to enhance research output.

The facility covers research from basic microbial screening through to clinical sample processing and analysis.

- High Throughput Robotic Screening
- siRNA library against 7500 human genes
- LifeArc library of 20000 small compounds for drug screening
- Fungal and bacterial strain collections for:
  - Gene deletion
  - Gene Overexpression
  - Protein-protein interaction

- Biomarker Screening
  - Custom-designed processing of clinical and non-clinical samples.
  - Biomarker assay development and validation
  - Gene expression, genotyping and immunoassays
  - From single sample to mid-throughput

www.ncl.ac.uk/htsf
Electron Microscopy

Specialist high resolution, high magnification imaging from a range of biological and material samples.

Our primary services are:
- Transmission Electron Microscopy (TEM)
- Scanning Electron Microscopy (SEM)
- Serial Block Face Imaging (SBF-SEM)

In addition we offer:
- Cryo TEM of vitrified proteins
- Elemental analysis on the SEM with the Bruker EDS system
- Image analysis software and training for 3D reconstruction
- Basic 3D printing

We train users so they can access the facility independently, or we can provide a full or supported imaging service.

We also provide sample preparation services for both TEM and SEM.

www.ncl.ac.uk/emrs
EM.researchservices@ncl.ac.uk
A number of facilities are operated in partnership with Newcastle Hospitals, combining clinical and academic expertise to enable high-quality, cutting-edge clinical research and services.

The Newcastle upon Tyne Hospitals

One of the largest NHS organisations in the UK, the Newcastle upon Tyne Hospitals NHS Foundation Trust has a wealth of experience and a successful track record in recruiting patients and delivering commercial research.

Our state of the art clinical research infrastructure enables us to undertake trials from Phase 1 through to Phase 4 in a wide variety of therapy areas, and includes:

- The Newcastle NIHR/Wellcome Trust Clinical Research Facility, encompassing the Clinical Ageing Research Unit and the Dental CRF
- The Cellular Therapies Facility, offering Advanced Therapies GMP development and manufacturing services in specialist MHRA-licenced facilities
- The North East's first and only permanent research Positron Emission Tomography (PET) MRI scanner
- One of the eighteen Experimental Cancer Medicines Centres in the UK, the Sir Bobby Robson Cancer Trials Research Centre
- The Molecular Pathology Node, one of only six in the UK

www.ncl.ac.uk/research/facilities/clinical
www.newcastle-hospitals.org.uk
Flow Cytometry

A state of the art facility delivering an innovative, cutting-edge cytometry provision.

One of the largest flow cytometry facilities in the UK/Europe, the Flow Cytometry Core Facility (FCCF) provides a comprehensive solution for users to perform a variety of assays, including:

- Cell Sorting
- Mass Cytometry (suspension and imaging)
- High dimensional fluorescence flow cytometry
- Imaging Flow Cytometry
- Novel method development and implementation
- Metabolic measurements with Seahorse technology

Our experienced group provides training for new users, and offers ongoing support throughout the process, from experimental planning to data analysis and interpretation.

www.ncl.ac.uk/fccf
fccf@ncl.ac.uk
Genomics

A next-generation sequencing (NGS) genomics core facility (GCF) specialising in single cell applications.

The GCF provides application training through to complete service delivery and sample management on the following platforms:

- Sample QC
- ddPCR and production scale qPCR
- NGS - Illumina MiSeq, NextSeq 500 and NovaSeq 6000
- Single cell isolation and sample processing - 10X Genomics, Fluidigm C1 and Leica LMD7

The GCF has dedicated and experienced staff, capable of supporting services ranging from sample QC through to the delivery of large scale discovery and translational research projects involving genomic, transcriptomic, epigenomic and single cell analysis.

www.ncl.ac.uk/gcf
genomics@ncl.ac.uk
The Infectious Diseases Facility (IDF) is the only containment level 3 (CL3) research facility in the North East of England.

The IDF is equipped with core apparatus for the culture and / or processing of high risk samples, including a Leica CM1950 cryostat for the preparation of sections from frozen, unfixed tissue.

Samples can be processed in the IDF for down-stream analyses in other facilities. In addition, there is capacity for the low temperature storage of material.

Our specialist staff provide training and advice on the safety aspects of working at CL3 to enable researchers to produce high quality data in a highly specialised field of research.
The NanoString nCounter Analysis System delivers direct profiling of individual nucleic acid and protein molecules in a highly multiplexed single reaction, without any need for amplification.

The NanoString protocol provides digital readouts of relative gene expression from hundreds of cDNA, mRNA, and miRNA fragments from extracted nucleic acids, FFPE material or whole cell lysate, whilst obviating any enzymatic reactions that may introduce bias in the results.

Benefits of using the nCounter Platform:

- Ability to measure 20 to 800+ genes in a single reaction
- Digitally detect and analyse samples in a fully automated manner
- No signal amplification or polymerase steps required
- High flexibility of sample input (including FFPE samples)

About the Service:

- Technician-run service with specialist advice available
- Turnaround time for samples – approximately 10 working days
**Preclinical In Vivo Imaging**

Providing expertise, training, and cutting-edge *in vivo* imaging modalities for scientific research at a molecular and cellular level.

The Preclinical In Vivo Imaging Facility (PIVI) provides a broad range of services and training to suit all levels of experience.

Our expert staff provide a range of services:
- Training
- Experimental design
- Imaging acquisition
- Data analysis

Our high quality equipment includes:
- Computerised Tomography (CT)
- Magnetic Resonance Imaging (MRI)
- In Vivo Imaging System (IVIS)
- Bioluminescence
- Fluorescence

[www.ncl.ac.uk/pivi](http://www.ncl.ac.uk/pivi)
preclinicalimaging@ncl.ac.uk
Proteins are at the core of everything that happens in any living system. They catalyse biochemical reactions, provide structure, transmit information and regulate cell death and growth. At NUPPA we have tools to identify proteins, to quantify individual proteins or even most proteins in complex mixtures (proteomics).

Protein function can be regulated through post-translational modifications, such as phosphorylation and acetylation. We can help find out where proteins are modified, how they are modified, and to what degree they are modified. We are also able to make and purify recombinant proteins and have tools to investigate the function of purified proteins or their interactions with ligands.
Further Specialist Facilities

Explore Newcastle University's full range of specialist facilities

- Pharmacy
- Muscle Performance and Exercise Training
- Single Cell
- Biomarkers
- Marine Technology
- XPS
- Marine Science
- Electroencephalography (EEG)
- Industrial Statistics
- Carbon Research
- Civil Engineering
- Global Urban Research
- Tyne Subsea
- Oral Health
- Agriculture
- Chemical and Materials Analysis
- Human Developmental Biology Resource

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