SCIENCE & ENGINEERING RESEARCH FACILITIES FOR COMMERCIAL CHALLENGES

THE UNIVERSITY OF EDINBURGH

EDINBURGH INNOVATIONS
Explore opportunities, build ideas and deliver results with the University of Edinburgh

The University of Edinburgh College of Science and Engineering is host to an extensive range of facilities, equipment and expertise which can be accessed by companies and organisations for in-house projects.

From simple routine testing to more complex development projects, we can provide the equipment and expertise to solve a huge variety of commercial challenges. Our experts have experience of working with both SMEs and multi-nationals across a range of sectors and are able to design flexible programmes for each specific requirement.

Edinburgh Innovations is the University of Edinburgh’s commercialisation service. Contact Edinburgh Innovations to find out more about how to access the facilities, equipment and expertise at the University, or to discuss a particular project in greater depth.
## School of Biological Sciences

<table>
<thead>
<tr>
<th>Facility</th>
<th>Services</th>
</tr>
</thead>
</table>
| **Centre Optical Instrumentation Laboratory (COIL)** | • Confocal and multi-photon imaging  
  • High accuracy motorised stage for multipoint imaging and tile scanning  
  • Environmental chamber ambient to 45°C  
  • Perfect focus for long-term timelapse  
  • Spectrometer detection for all visible wavelengths  
  • High sensitivity GaAsP detectors |
| **Edinburgh Plant Growth Facility** | • Tissue culture facilities for the maintenance and propagation of plant tissue culture materials  
  • 3 temperature controlled rooms with 45m³  
  • 2 walk-in growth rooms with a total of 80m² of shelving. One room is running at long day conditions (16 hours light) and one in short day conditions (9 hours light)  
  • 5 Snijders Economic Deluxe and 2 Snijders MicroClima growth cabinets  
  • The Grodome is used for growing transgenic host plants and two smaller chambers for research into plant pathogens  
  • Glasshouses and outdoor plots |
| **Edinburgh Protein Production Facility (EPPF)** | • Production and purification of proteins  
  • Biophysical analysis of proteins and ligands  
  • Biophysical characterisation  
  • Pre-clinical drug discovery |
| **Flow Cytometry Core** | • Multi-parameter measurement of biological particles  
  • Cell counting  
  • Cell sorting  
  • Detection of biomarkers  
  • Protein engineering |
| **Synthsys (Centre for Synthetic and Systems Biology)** | • Edinburgh Genome Foundry  
  • Kinetic Parameter Facility  
  • Laser Enabled Analysis and Processing (LEAP)  
  • Single cell analysis and microscopy  
  • Plant phenomics  
  • Data management and models  
  • Chemical translational biology |

### Commercial applications

<table>
<thead>
<tr>
<th>Agriculture, Food and Plant Biology</th>
<th>Food and Drink</th>
<th>Life Sciences and Biotechnology</th>
<th>Pharmaceuticals and Medical Biotechnology</th>
<th>Sustainability and Circular Economy</th>
<th>Senior Tech and Nanotechnology</th>
<th>Formulations, Manufacturing and Materials</th>
<th>Construction, Infrastructure and Fire</th>
<th>Energy, Marine, Renewable, Decommissioning and Petrochemical</th>
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## School of Chemistry

<table>
<thead>
<tr>
<th>Facility</th>
<th>Services</th>
<th>Commercial applications</th>
</tr>
</thead>
</table>
| **Computational Modelling & Fermentation** | • Ultra-fast chemical physics  
• Quantum-mechanical modelling of materials  
• Quantum-classical modelling of enzyme-catalysed reactions  
• Classical modelling of soft matter computational drug design  
• Create organisms to spec  
• Produce milligrams and grams of recombinant proteins  
• Produce recombinant expression constructs for E. coli and Pichia Pastoris  
• Fermentation of the above on a 10–15 litre scale for protein production | ✓ ✓ ✓ ✓ ✓ |
| **Crystallography, Single crystal and Powder X-ray diffraction** | • Detailed study of organic or organometallic complexes providing chemical identity, molecular conformation and crystal packing analysis  
• In situ single crystal growth by laser heating | ✓ ✓ ✓ ✓ ✓ |
| **Mass Spectrometry and Protein Characterisation (SIRCAMS)** | • MALDI or Liquid Extraction Surface Analysis (LESA)  
• Spatial distribution of endogenous molecules, drugs and metabolites  
• 3D statistical analysis and construction of 3D images  
• Intact mass determination  
• Bottom-up and top-down proteomics  
• Hydrogen-deuterium exchange  
• Ion mobility  
• Non-covalent interactions and native mass spectrometry | ✓ ✓ ✓ ✓ ✓ |
| **NMR** | • 400–800MHz NMR spectrometers for high definition and accurate results  
• Analysis of fast reactions in situ  
• High throughput service from Cryoprobe technology offering increased speed and sensitivity  
• Self-service facility access | ✓ ✓ ✓ ✓ ✓ |
| **Pyrochemical Research Lab** | • Advanced equipment for research in molten salt pyrochemical processing  
• Suite of interconnected controlled atmosphere dry-boxes equipped with furnaces, cell systems, potentiostats and other equipment for characterisation and development of essential elements  
• Demonstrate individual component or a complete pyrochemical process including monitoring and analysis  
• Unique facilities to develop and demonstrate integrated pyrochemical reprocessing of nuclear fuel, along with the required process monitoring | ✓ ✓ ✓ |

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This table summarizes the facilities and services offered by the School of Chemistry, along with their commercial applications across various sectors.
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<thead>
<tr>
<th>Facility</th>
<th>Services</th>
<th>Commercial applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Adsorption Lab</td>
<td>• Dual piston pressure swing adsorption system</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>• Quantachrome AutoTap and Ultrapycnometer</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>• Quantachrome Porometer 3Gzh for membranes and membrane modules</td>
<td>✓</td>
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<tr>
<td></td>
<td>• Membrane permeation cells</td>
<td>✓</td>
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<tr>
<td></td>
<td>• High-pressure static volumetric adsorption rig</td>
<td>✓</td>
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<tr>
<td>BRE Centre for Fire Safety Engineering</td>
<td>• Cone calorimeter</td>
<td>✓</td>
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<tr>
<td></td>
<td>• FM global fire propagation apparatus</td>
<td>✓</td>
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<tr>
<td></td>
<td>• Heat-Transfer Rate Inducing System (H-TRIS)</td>
<td>✓</td>
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<tr>
<td></td>
<td>• Materials testing</td>
<td>✓</td>
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<tr>
<td>Bio Imaging Facility</td>
<td>• Confocal Raman spectroscopy</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>• Label-free optical microscopy</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>• CARS (Coherent Anti-Stokes Raman Scattering)</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>• SRS (Stimulated Raman Scattering)</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>• Atomic force microscopy</td>
<td>✓</td>
</tr>
<tr>
<td>Composite Materials Lab</td>
<td>• 300 kN MTS screw-driven test machine with hydraulic grips</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>• Environmental chamber</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>• 100kN and 250kN Instron servo-hydraulic test machine</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>• 50kN Zwick screw-driven test machine</td>
<td>✓</td>
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<tr>
<td></td>
<td>• Imetrum non-contact extensometry and DIC</td>
<td>✓</td>
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<tr>
<td></td>
<td>• Triton DMTA and Perkin-Elmer DSC</td>
<td>✓</td>
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<tr>
<td></td>
<td>• Optical microscopy</td>
<td>✓</td>
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<tr>
<td>FASTBLADE Structural Composites Research Facility</td>
<td>• Full structural performance test service</td>
<td>✓</td>
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<tr>
<td></td>
<td>• Cost effective, accelerated testing of composite and metal structures</td>
<td>✓</td>
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<tr>
<td></td>
<td>• Full-scale static and dynamic testing</td>
<td>✓</td>
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<tr>
<td></td>
<td>• Eigenfrequency determination</td>
<td>✓</td>
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<td></td>
<td>• Validation of repairs and design changes</td>
<td>✓</td>
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<tr>
<td></td>
<td>• Manufacturing inspections of blades, blade moulds and other specimens</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>• Advanced non-destructive testing methods for thick composites</td>
<td>✓</td>
</tr>
<tr>
<td>FloWave Ocean Energy Research Facility</td>
<td>• Marine renewable energy technology testing</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>• 360° symmetry of wave and current conditions</td>
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</tr>
<tr>
<td></td>
<td>• 1/20th scale model testing conditions</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>• Curved wave tank</td>
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## School of Engineering, GeoSciences, Physics & Astronomy

### Membrane Technology Facilities
- Radiotracer facility
- A controlled environment room for high precision experiments
- A laboratory water purification system
- Extensive cross-flow, stirred cell, submerged and electrodialysis membrane filtration systems

### Scottish Microelectronic Centre
- Class 10 cleanrooms
- Parametric Testing
- Post-processing sub-micron CMOS (complementary metal-oxide-semiconductor)
- Fabricating of non-silicon based microsystems

### The Structures Laboratory
- Structures test hall with strong floor \( (D*B*H = 9m*6m*6.2m) \)
- "Meccano" test frame system
- Structural testing with up to 2,000 kN capacity for static (load controlled) and 1,000 kN cyclic (fatigue) tests
- Dropping tower of 3m height
- Associated material laboratories contain static-rated universal test machines (from 50 kN to 3,000 kN)

### UK Biochar Research Centre (UKBRC)
- Biochar production and analysis of energy rich co-products
- Applications of biochar
- Feasible development for sustainable resource management

### Edinburgh Complex Fluids Partnership
- Structural characterisation
- Rheoimaging and rheology
- Laser diffraction
- Product stability
- DNA manipulation
- Microbiology
- High performance computing

### Centre for Science at Extreme Conditions
- High-pressure diffraction
- Low-temperature measurement
- Magnetism, astrobiology and shielded X-ray laboratories

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| Centre for Science at Extreme Conditions | • High-pressure diffraction
• Low-temperature measurement
• Magnetism, astrobiology and shielded X-ray laboratories | | | | ✓ | | | | |
Edinburgh Innovations is the University of Edinburgh’s commercialisation service.

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