



Knowledge, skills and experience matrix of The University of Edinburgh for IBioIC

The University of Edinburgh (www.ed.ac.uk)

The University of Edinburgh is a member of the [Russell Group](#) of research-led British universities and, along with Oxford and Cambridge, one of several British universities to be a member of both the Coimbra Group and the LERU (League of European Research Universities). The University is also a member of Universitas 21, an international association of research-led universities.

Carbon Capture [Contact IBioIC for Contact Details]

Chemical process engineering, Carbon Capture group at IMP

Sociology of Life Sciences [Contact IBioIC for Contact Details]

Social Science Aspects, Sociology of the life sciences and the emergence, development and epistemic aspirations of the fields of systems biology and synthetic biology.

Synthetic applications of Enzymes [Contact IBioIC for Contact Details]

Synthetic applications of enzymes (natural & engineered); Identification of novel biocatalysts; Action of microbes on toxic industrial materials

Computational Systems Biology [Contact IBioIC for Contact Details]

New topical modelling techniques; Model-driven design; New methods in data analysis; Foundational approaches to quantitative biology; syntaxes for representing, modelling, and understanding large protein networks; concurrent and stochastic systems.

Genomic and Metagenomics Techniques [Contact IBioIC for Contact Details]

The study of ecological processes determines the diversity, functionality and variability in natural microbial communities and in model laboratory systems. Applications improve the performance of microbial devices such as fuel cells and algal bioreactors as well as in the human intestine. We use modern genomic and metagenomics techniques based on high-throughput DNA sequencing, proteomics, fingerprinting techniques and subsequent pure-culture isolation, as well as modelling microbial communities

Synthetic Biology and DNA assembly [Contact IBioIC for Contact Details]

Synthetic biology and DNA assembly methods; Conversion of cellulosic biomass to useful products; Development of whole-cell biosensors

Cell Biology [Contact IBioIC for Contact Details]

Study of bacterial pathogens, particularly those associated with food borne infection and medical implant infections. Key themes include: Developing live and peptide based vaccines; Characterising bacterial stress and response mechanisms for understanding and elimination of bacterial pathogens; Development of novel systems for quantitative biofilm analysis, for measuring bacterial survival and antibiotic effectiveness; Developing novel bacterial imaging and elimination systems for medical use; Use of polymer microarrays to identify compounds which strongly bind or repel bacterial binding to surfaces.

Synthetic Biology and Biotechnology [Contact IBioIC for Contact Details]

Esterases and their application; enzymatic degradation of lignin to feedstock chemicals; Identification and development of novel enzymes; Bioremediation.

Proteomics [Contact IBioIC for Contact Details]

Quantitative proteomics, Nitrogen fixation in azolla.

Microbial and plant synthetic biology [Contact IBioIC for Contact Details]

Microbial and plant synthetic biology, Synthesis of high value chemicals and proteins, Synthetic biochemistry.

Biochar Technologies [Contact IBioIC for Contact Details]

Technologies for Biochar production and utilisation of by-products (oil and gas) for bio-fuels and bio-energy generation. Thermochemical conversion of carbonaceous materials gasification, pyrolysis, combustion, etc.). CO₂ capture and transport technologies (post-combustion, pre-combustion, oxy-combustion and advanced capture technologies).

Plant Viral vectors [Contact IBioIC for Contact Details]

Plant-viral vectors for production of high value products; Rational design of agrochemicals for movement in plants.

Synthetic Genomics [Contact IBioIC for Contact Details]

Synthetic genomics; synthetic yeast genome consortium.

Synthetic Biology [Contact IBioIC for Contact Details]

Co-director Edinburgh Genome Factory

Innogen [Contact IBioIC for Contact Details]

Social Science Aspects; Governance; Policy; Value Systems and business models; Regulation; Risk assessment.

Catalysis [Contact IBioIC for Contact Details]

Homogeneous Catalysis, Catalyst Recycling, Mechanistic Studies, Ligand Design, Sustainable Chemistry