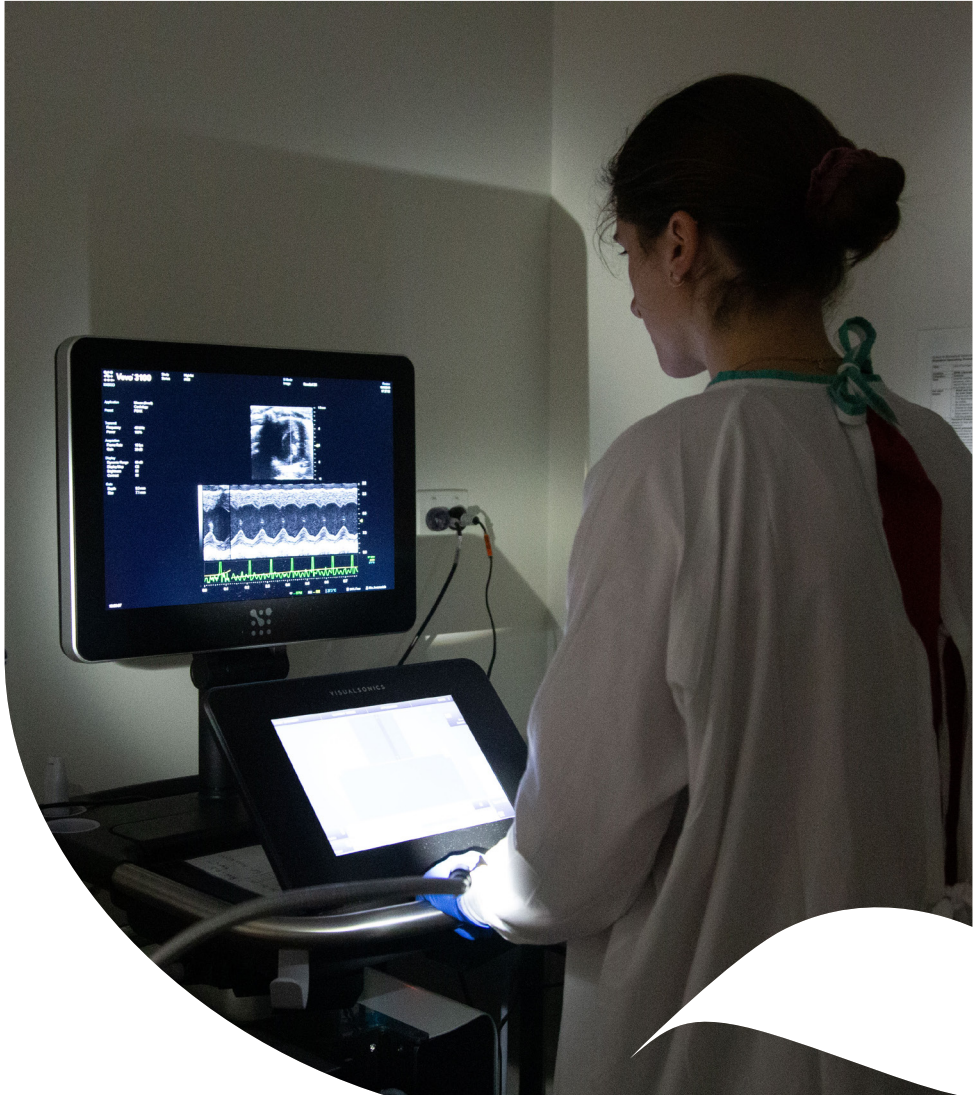


Biomedical Sciences

# Integrated Physiology Facility IPF



The Integrated Physiology Facility (IPF) offers access to specialised surgical and physiological testing equipment for the investigation of various biological disciplines using rodent models. Within the School of Biomedical Sciences, the IPF functions as a collaborative learning space for both researchers and students, where experimentally induced pathologies, or therapeutic interventions can be performed using wild type and transgenic animals.

The IPF possesses several dedicated functions including PC2 certification; small animal surgical facilities and equipment; ultrahigh resolution ultrasound; continuous real-time assessment of metabolism, activity and physiology; ionising radiation certification (radiolabelling); and rodent housing.

The IPF provides research support and assistance in the development of projects by offering technical information and advice on animal ethics applications where needed.

## Services

The IPF offers hands on training with data acquisition using specialised equipment.

**Animal housing** including dedicated environment-controlled programmable chambers for post-surgery recovery or altered light/dark cycles.

**Well-equipped surgery space** with anaesthetic equipment (isoflurane vaporisers), surgery tools, ventilators, pulse oximeter, stereotaxic frame and drill, non-invasive BP monitoring, plus surgical microscope with video capability.

**Phenomaster** for non-invasive, detailed, synchronous characterisation of metabolic and movement patterns in experimental animals under controlled conditions.

**NMR analyser** for assessment of body composition, including total fat and lean tissue mass.

**Hypoxia/hyperoxia chamber** for creating an isolated and highly controlled oxygen environment for small animal models.

**Vevo 3100 ultrahigh resolution ultrasound** for in vivo assessment of organ (i.e., heart, kidney, liver) morphology and function, guided injections, tumour monitoring, early determination of pregnancy or embryo staging and measurement of blood flow in utero.

**Vevo 3100 ultrahigh resolution echocardiography** for detailed in vivo assessment of systolic and diastolic function in wild type mice, as well as in models of altered function (i.e., transgenic, myocardial infarction, transverse

and abdominal aortic constriction, drug-infusion, exercise), including integration of ECG analysis with cardiac function.

**Virus-based or drug delivery in vivo.** Assistance with viral vector design/production (Adenovirus and Adeno-Associated Virus) and models of gene deletion (cell/tissue specific expression of iCre for Cre-lox models of gene knockdown). Assistance with pharmacokinetics of drug treatments.

**Langendorff isolated heart perfusion system** for assessment of acute changes in systolic and diastolic function, drug effects on cardiac function and on vascular function. Examination of acute outcomes from ischemia-reperfusion injury, including assessment of protein efflux from hearts.

**Telemetry receivers** for continuous assessment of blood glucose, pressure, bipotential, temperature and activity.

**Microwave fixation system** for rapid fixation of brain tissue.

The IPF practices humane care and use of animals, ensuring compliance with UQ Animal Ethics Committees, the Institutional Bio-safety Committee, and the Office of the Gene Technology Regulator.



## UQ's School of Biomedical Sciences – mission statement:

By harnessing our diversity across the breadth of biomedical science, we will generate, disseminate and apply foundational biology underpinning health and disease to inspire and empower the next generation of leading researchers, educators, and healthcare professionals to innovate together for better health outcomes globally. Our innovative research encompasses basic discovery through translational pathways to medical solutions:

**Cell architecture:** We use sophisticated molecular and imaging techniques to explain how various cellular components and pathways contribute to building healthy bodies.

**Receptors and signalling:** We decipher the passage of external messages from the cell surface, through cytoplasmic signalling pathways, and ultimately to genetic regulatory circuits in the nucleus.

**Chronic disease:** We characterise the genetic, molecular and cellular microenvironments associated with diseases, such as Alzheimer's disease, cancer, MND and others.

**Drug design and development:** We identify critical biological targets and design drugs based on structural analyses to develop novel therapies.

**Functional and comparative anatomy:** Our interdisciplinary studies of structure and function across phylogenetically disparate species advance our understanding of the human body in healthy, aging and diseased states.

**Injury and repair:** We study fundamental mechanisms of cells in response to stress, consequences of repair processes and how these may be influenced for optimal outcomes.

**Musculoskeletal and motor control:** We develop and apply novel tools, to investigate muscle function and neural control of muscles in humans.

**Neurobiology and brain function:** We search for and discover genetic and environmental factors that lead to and maintain healthy nervous systems.

**Reproduction:** We investigate the genetic and molecular environment during early fetal development to advance reproductive technologies and facilitate healthy pregnancies.

### Contact

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