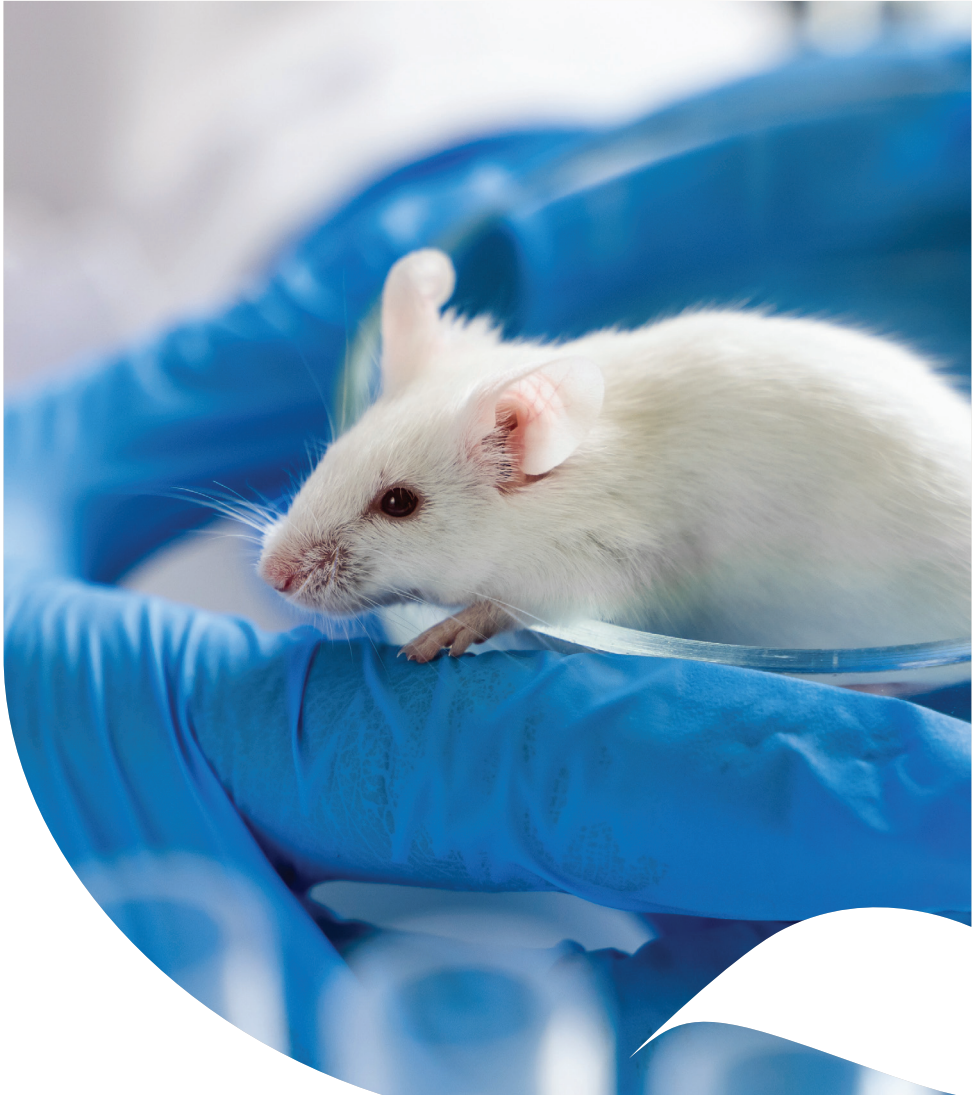


Biomedical Sciences

Centre for Integrated Preclinical Drug Development (CIPDD)



Our expertise

Our specialised expertise lies in the field of pain. We focus on discovery-translation and new drug development and have:

1) a portfolio of sophisticated/refined rodent pain models that mimic individual human pain conditions

- Studies are conducted in a purpose-built, GLP-recognized facility; unique in Australia and rare internationally
- Aim: Improve preclinical to clinical translation

2) capabilities to establish other efficacy models in rodents upon request

Our methods for efficacy testing include:

- Pain behavioural read-outs (blinded assessments): mechanical allodynia, mechanical & thermal hyperalgesia, burrowing, gait analysis (CatWalk™ XT system)
- General health
- Clinical signs
- ex vivo: IHC, molecular biological methods, etc.

We use multiple dosing routes

I.c.v., i.t., i.v. injection or infusion (via Culex machine), i.p., s.c., oral by gavage, i.pl., i.d.

Our models

We currently have 15 established pain models for a range of diseases.

Neuropathic pain

- Chemotherapy-induced peripheral neuropathy (cisplatin)
- 2 x antiretroviral drug induced toxic neuropathy (d4T, ddC)
- Sciatica – Chronic constriction injury of the sciatic nerve
- RR-EAE-mouse model of multiple sclerosis-induced central neuropathic pain
- STZ-induced rat model of painful diabetic neuropathy (PDN)
- ZDF genetic Type 2 diabetic rat model of PDN
- Capsaicin-induced hindpaw sensitivity

Mixed neuropathic / inflammatory pain

- 2x cancer-induced bone pain: breast and prostate

Inflammatory pain

- Chronic low back pain
- MIA-rat model of osteoarthritis
- i.pl. FCA-induced unilateral inflammatory pain in the hindpaw

Nociceptive pain

- Post-surgical pain (Brennan model)
- Acute pain (tail flick)
- Acute pain (hot plate)
- i.pl. formalin

Other models include:

- Multiple Sclerosis
- Diabetes

Other methods include assessment of:

- Respiratory depression via plethysmography in awake, freely-moving rats
- Constipation
- GI motility
- Castor oil induced diarrhoea

Drug treatment



Pain behavioural readouts

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

Em. Professor Maree T Smith AC

Director
CIPDD, School of Biomedical
Sciences, Faculty of Medicine
The University of Queensland

E: maree.smith@uq.edu.au

T: +61 7 33652554

Dr Andy Kuo

Centre Manager
CIPDD, School of Biomedical
Sciences, Faculty of Medicine
The University of Queensland

E: a.kuo1@uq.edu.au

T: +61 7 33469365