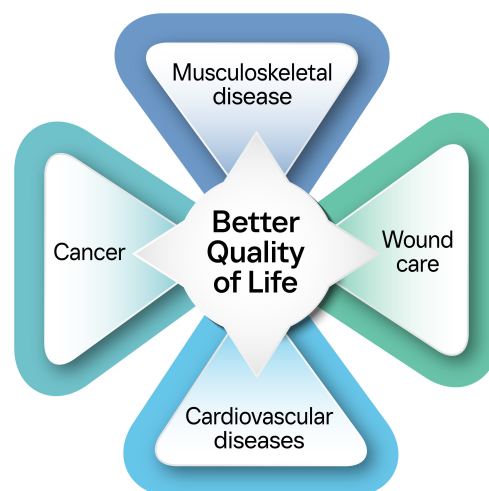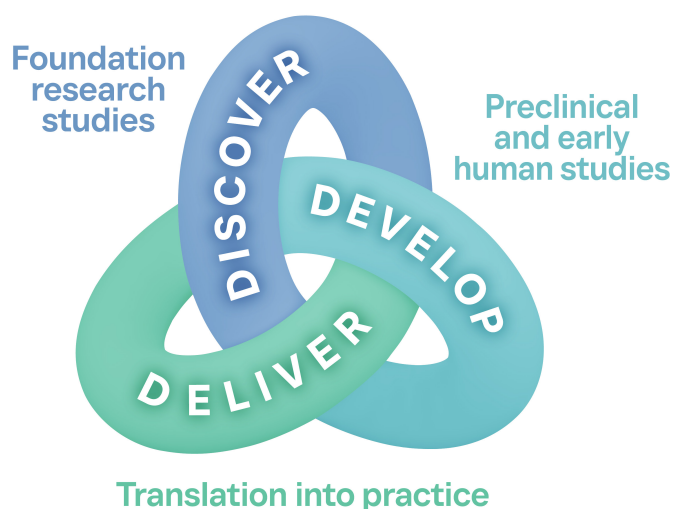# Frontier Biomedical Technologies

We discover, develop and deliver the next frontier of biomedical technologies for better patient treatment and quality of life

Centre for Biomedical Technologies

We partner with clinicians to identify unmet clinical needs and develop innovative devices and therapies. Within the translational research continuum, we conduct fundamental research, rigorous preclinical studies and early clinical trials, and facilitate translation to clinical or industrial applications. Our work delivers impact through improved outcomes for patients with conditions including musculoskeletal disorders, cardiovascular diseases, cancer, chronic wounds, and more.

Foundation research studies — **DISCOVER**

Preclinical and early human studies — **DEVELOP**

Translation into practice — **DELIVER**

Better Quality of Life: Musculoskeletal disease, Wound care, Cardiovascular diseases, Cancer

170,000+ patients helped by our inventions

#1 in Australia for biomedical engineering

50+ key industry and clinical partners

Key academic outcomes

- Clarivate Highly Cited Researcher
- Fellows of the Australian Academy of Technological Sciences and Engineering; Australian Academy of Health and Medical Sciences
- Batterham Medal for Engineering Excellence
- The Australian's Top 40 Lifetime Research Achiever
- Eureka Prize

Key translational outcomes

- 3D-printed, dissolving bone scaffolds for regeneration and repair
- Custom mattresses for spinal surgery patients
- A flexible implant that promotes bone healing
- 3D modelling tool that informed the development of orthopaedic implants
- A natural wound-healing solution that reduces medical waste
- A one-stop-shop for podiatrists that allows them to scan, diagnose and print custom orthoses
- An AI-powered model to assist clinical decisions for the use of heart-lung devices

QUT | Centre for Biomedical Technologies

Capabilities

Our expertise spans a range of capabilities that together inform the development of frontier biomedical technologies, including new treatments, diagnostics and prevention strategies.
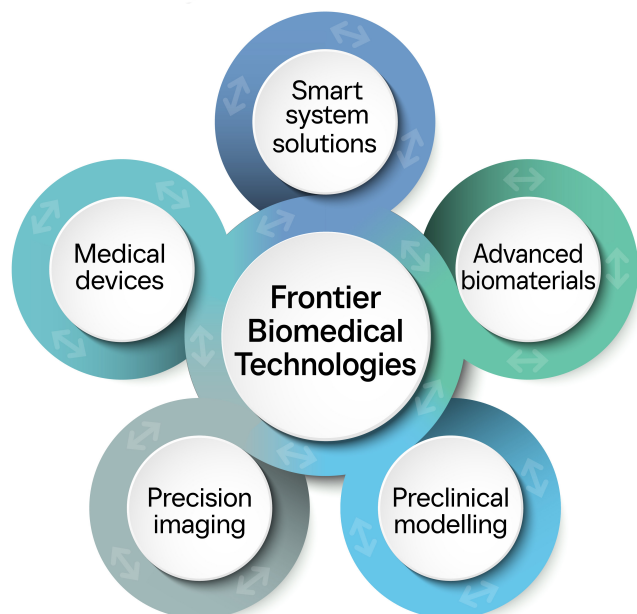
| Preclinical Modelling

We accelerate access to safer, more effective and cost-efficient medical solutions through improved preclinical modelling, ensuring only the most promising treatments advance into human clinical trials. Our models include: organs-on-chip to test drugs systemically without the need for animal models; 3D tissue models that simulate the bone microenvironment to assess treatments for individuals and drug development; a tool that informed the development of orthopaedic implants for a diverse patient population; and advanced computational models to understand soft tissue in health and disease.

| Advanced Biomaterials

We engineer advanced materials to support the body to repair and regenerate, including: a hydrogel to prevent osteoarthritis through treating cartilage injuries; cell-based therapies to repair joint tissues and treat osteoarthritis; a tissue graft from dehydrated placental membrane to support wound healing; and 3D "micro tissues" for cancer treatment and more efficient drug development.

| Medical Devices

We integrate biology and technology to create medical devices that harness our body's capabilities to treat diseases and injuries. Our researchers have developed devices including: 3D-printed scaffolds for bone regeneration; custom mattresses for spinal surgery; a flexible implant for bone healing; and a next-generation heart pump.

| Smart System Solutions

We develop intelligent technologies, such as AI, remote monitoring systems, sensors and robotics, to enhance patient care and augment capabilities of human practitioners. Our researchers have pioneered technologies including: AI-driven medical imaging analysis to detect neurodegenerative diseases; wearable sensors for monitoring stress; platforms that allow allied health professionals to scan, diagnose and print custom orthoses; and prototype robotic assistants for knee surgery.

| Precision Imaging

We provide clearer insights for diagnosis, treatment and development of new therapies. We are designing imaging solutions, including: automatic interpretation of ultrasound images for swifter diagnosis; mathematical models that improve MRI images of the brain; enhanced computational models for joint conditions that allow virtual testing of treatments; and automated analysis of medical imaging for applications including more precise radiotherapy.

Contact us

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Find out more
research.qut.edu.au/cbt