

UQ'S MRI TECHNOLOGY

COMMERCIALISATION STORIES

HOME GROWN MRI TECHNOLOGY IS SAVING LIVES AROUND THE WORLD



Across the globe, more than eight billion scans have been completed using world-leading magnetic resonance imaging technology developed at The University of Queensland.

For over two decades The University of Queensland (UQ) has been at the forefront of magnetic resonance imaging (MRI) innovation, with its first innovation now used in 67% of the MRI scanners manufactured worldwide.

UQ'S RESEARCH EXCELLENCE TO EXCELLENCE PLUS WITH UNIQUEST

UQ Research Strength:	Information Systems and Data Management
UQ Innovator(s):	Professor Stuart Crozier and Emeritus Professor David Doddrell
UQ Faculty or Institute:	Faculty of Engineering, Architecture and Information Technology
UQ Research Outcome:	Image correction technology for magnetic resonance imaging machines
UniQuest IP Position:	Patent application
UniQuest Partnering:	Partner with leading companies in market
UniQuest Commercialisation:	Cross-license to Siemens and GE Healthcare

ELECTRICAL ENGINEER MEETS MEDICAL NEED

This revolutionary innovation started when Professor Stuart Crozier was an undergraduate electrical engineer, who took up a vacation placement at Brisbane's Princess Alexandra hospital in the bio-medical engineering department. Working in the spinal unit he saw how some of the bio-medical engineers had developed small devices to activate patient muscles, enabling them to do ordinary things like lifting a cup to their mouth. This inspired Professor Crozier to pledge to use his skills and understanding of technology to benefit patients. In turn, this led to a placement in an MRI research group at the Mater Hospital in 1988, which was to transform his life and that of so many others.

Collaborating with Professor David Doddrell, at UQ's Centre for Magnetic Resonance (now the Centre for Advanced Imaging), Professor Crozier co-invented a signal correction technology that corrected magnetic field distortions to produce faster, clearer and more accurate images - without adding to the cost of MRI machines.

MAGNETIC RESONANCE IMAGING INNOVATION

An MRI is a non-invasive, painless diagnostic technique that gives detailed pictures of organs and structures in the body. It uses a powerful magnetic field to measure the magnetism within a body, creating thin-section images which are used to map and analyse the body in great detail. This aids in the diagnosis of many medical conditions.

The UQ developed MRI technology enables subtle image features to be identified, improving the quality of diagnosis at an earlier stage of disease and increasing the success rate of early medical intervention.

With the help of UniQuest, the main commercialisation company of UQ, this technology was licensed to the two largest companies in the MRI industry, Siemens and GE Healthcare. The UQ image correction technology of Professor Crozier has been incorporated into their MRI machines since, representing two thirds of all MRI machines on the market and benefiting over eight billion people.

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MORE MRI INNOVATIONS AND COMMERCIALISATION

Director of Biomedical Engineering within the UQ School of IT and Electrical Engineering, Professor Crozier is a prolific inventor with 24 patent applications to his name in 2014 and he has a deep understanding of innovation needs in the marketplace.

In 2005, Magnetica Limited was established by UniQuest with Professor Crozier as the founding scientist. It was founded to commercialise high performance superconducting MRI magnets for compact, portable MRI machines that can scan human limbs without having to immerse the whole body in the magnetic field. Up to 2014, the company had attracted over \$12 million in investment and grant funding.

Magnetica's research and innovation in magnet design also led to the development of small 1.5T extremity magnets used in systems sold by GE Healthcare. It was developed in collaboration with Japan Superconductor Technology, Inc (Jastec), a subsidiary of multinational Kobe Steel, and supported by grant funding from the Queensland Government.

RECOGNITION

For his contribution to the field of Magnetic Resonance Imaging from over 20 years, Professor Crozier received the prestigious Australian Academy of Technological Sciences (ATSE) Clunies Ross Award and in 2014 he was also acclaimed as a UQ Innovation Champion.

Today Professor Crozier and his team are continuing to research and develop innovative imaging technologies, playing a key role in the development of modern MRI and Nuclear Magnetic Resonance (NMR) systems produced and sold by leading global companies. They have been working to enhance magnet design, radiofrequency coil design and gradient coil design to develop compact, portable machines and improve the comfort of patients.

With 30 years of world leading MRI research and development at The University of Queensland leading to a series of commercialisation outcomes, it has now become a self-reinforcing system with the resident knowledge of the industry, networks and commercialisation that momentum and royalties from the first MRI innovation can further research to generate new breakthroughs.



PARTNER WITH UNIQUEST

UniQuest is one of Australia's leading research commercialisation companies. It specialises in global technology transfer and facilitates access for all business sectors to the world class expertise, intellectual property and facilities at The University of Queensland, Australia.

OUR TRACK RECORD

UniQuest enters into over 400 research contracts per year – many repeat clients from industry.

UniQuest has created over 70 companies from its intellectual property portfolio, and since 2000 UniQuest and its start ups have raised more than \$515 million to take university technologies to market. UQ technologies licensed by UniQuest – including UQ's cervical cancer vaccine technology – have resulted in combined sales of final products in the order of \$13 billion net sales between 2007-2015.

If you want to know more about this commercialisation story or other offerings from UniQuest, contact:



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THE MRI JOURNEY SO FAR



Professor Stuart Crozier



Emeritus Professor David Doddrell

UQ Researchers

- Professors Stuart Crozier and David Doddrell developed an MRI technology which produces faster, clearer and more accurate images – by correcting magnetic field distortions – all without adding to the cost of MRI machines.
- The image correction technology which was licensed to Siemens and GE Healthcare, and is now used in 67% of the MRI scanners manufactured worldwide.
- As well as the image correction technology, Professor Crozier continues the innovation journey as a named inventor on 24 patent applications as of 2014 and a driving force in the establishment of Magnetica in 2005.
- In 2014, Professor Crozier was recognised as a UQ Innovation Champion.