

Call for more medical ultrasound research in Australia

August 26 2015, by Niki Widdowson

The QUT medical physicist who developed a fast, non-invasive way of using ultrasound to assess osteoporotic fracture risk says that ultrasound is the 'unsung hero' of the medical diagnosis and treatment world.

Professor Christian Langton, from QUT's Institute of Health and Biomedical Innovation (IHBI), said [ultrasound](#) had for too long been overlooked as the underdog to other imaging methods such MRI, X-ray CT and PET.

"We use ultrasound to monitor the developing foetus in obstetrics, to observe the movement of the heart and blood flow in cardiology, to guide biopsy needles in oncology, and to assess musculoskeletal tissues after an injury, but there could be many other uses," said Professor Langton, who heads the Quantitative Ultrasound Imaging and Characterisation (QUIC) research group at IHBI.

"For example, the IHBI research team is developing a robotic-ultrasound system to track the movement of tumours while radiation therapy is being delivered.

"Radiotherapy, to be effective, needs pinpoint accuracy but we know that tumours can move up to one centimetre through breathing or other involuntary movement, thus letting the radiation miss the tumour and damage healthy tissue instead.

"Another of our research projects is developing a robotic-ultrasound

computed tomography or CT scanner that does not use ionising radiation.

"This line of research has tremendous potential for reducing harmful accumulation of ionising radiation from multiple traditional X-ray CT scans, particularly in children."

Professor Langton said ultrasound also had great potential as a treatment tool.

"Ultrasound has been used to break up kidney and gall stones for a long time using a technique termed lithotripsy," he said.

"My team is trying to find a way to enable [ultrasound waves](#) to pass through the skull without distortion, which potentially could lead to both brain imaging and the treatment of diseases such as Parkinson's.

"This is probably the most exciting and ground-breaking project of my 35-year research career."

Professor Langton said it was time for research on new medical applications for ultrasound to be reinvigorated in Australia to revive the country's past glory in this field.

"I'm often informed that I'm probably the only academic ultrasound physicist in Australia. It's flattering but also a sad indication of the lack of research interest in this exciting technique," he said.

"It was Australian George Kossoff and colleagues who pioneered the technical breakthrough called 'grey-scale ultrasound', which allowed for images of much greater clarity and detail than before.

"That discovery is now the bed-rock of conventional ultrasound imaging.

"We owe it to these pioneers to continue investigating the uses of this cheap, portable imaging modality. It's safe for patients because it doesn't use non-ionising radiation and therefore ultrasound operators do not need protective shielding."

Professor Langton is one of the few academics to hold three research doctorates. He was awarded an honorary doctorate from the University of Eastern Finland in June, the only recipient of the 12 international doctorates from outside the EU or US.

Professor Langton said the conferment ceremonies were held only every five years and lasted three days including a procession through the city, a banquet, ball, ecumenical thanksgiving service and cruise.

"The occasion was a truly memorable experience; it is great to see an Australian university and researcher recognised on the world stage," he said.

Provided by Queensland University of Technology

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