

Printed kidney tissue closer to reality

28 May 2014, by Bronwyn Adams



Professor Melissa Little, Minister Ian Walker and Professor Justin Cooper-White at the announcement that Uniquest has signed an agreement with Organovo to print kidney tissue.

Queensland researchers are one step closer to printing 3D human kidney tissue thanks to a partnership between The University of Queensland and a US biotechnology company.

UQ, via its commercialisation company UniQuest, has signed an agreement with San Diego-based Organovo, which specialises in 3D printing of human tissues.

Under the agreement, Organovo will work with UQ researchers Professor Melissa Little and Professor Justin Cooper-White to ultimately produce 3D printed mini-kidneys.

Professor Little, from UQ's Institute for Molecular Bioscience, said 3D printing of fully functional kidney tissue would lead to better disease modelling and drug development.

"We will be able to grow mini-organs from the [cells](#) of patients with genetic kidney disease, both to better understand the nature of their disease and to test treatments that may improve renal function," she said.

"This will help us enormously in tackling [chronic kidney disease](#), a growing public health issue in Australia with one in three Australians at risk of developing the disease and a cost to the taxpayer of about \$1.8 billion per annum.

"These mini-kidneys could also be used to test the safety of [new drugs](#).

"The sad fact is that most new drugs fail during testing in humans and a big reason for that is that they turn out to be toxic to kidneys.

"If we can test a drug for kidney toxicity before commencing human trials we'll save lot of time, effort and, of course, money.

Professor Cooper-White, from UQ's Australian Institute for Bioengineering and Nanotechnology, has developed technology that permits stem cells to be cultured under thousands of different conditions.

This technology allows researchers to determine the best conditions for prompting [stem cells](#) to develop into tissue cells, include [kidney cells](#).

Professor Cooper-White said it took thousands of different cells on a large scale to create a functional mini-[kidney](#) suitable for drug and toxicity screening.

"The mini-kidneys being developed need to closely resemble the human organ so we can be confident that drug screening in the lab will generate the same response," Professor Cooper-White said.

"We believe our microbioreactor technology provides an environment more akin to that of a living human body, enabling us to provide cells with the optimum conditions needed to achieve the end objective of 3D printed mini-kidneys."

More information: www.uniquest.com.au/

Provided by University of Queensland

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