

Research reprograms future of kidney health

14 June 2013

University of Queensland researchers have reprogrammed adult kidney cells to act as stem cells to repair damaged kidneys.

The breakthrough is a vital step in the development of improved treatments for chronic kidney disease, which accounts for 15 per cent of all hospitalisations in Australia.

Professor Melissa Little, from UQ's [Institute for Molecular Bioscience \(IMB\)](#), led a team that identified a set of key genes that can be used to transform adult kidney cells.

" We determined that six key genes can prompt some types of adult kidney cells to regress to an earlier stage of development and act like the precursors to the cells of the nephron," Professor Little said.

" Nephrons filter the blood as it passes through the kidneys, with damage to nephrons causing kidney disease," Professor Little said.

" All the nephrons are formed before birth and people with fewer nephrons are at higher risk of kidney disease.

" By forcing adult cells to act like early nephron cells, we have potentially found a way to trigger the growth of new filters."

Professor Little said the only treatments for end stage kidney disease were transplantation or dialysis.

" Donated kidneys are rare and dialysis is costly and does not give patients a high quality of life," Professor Little said.

" This discovery is the first of its kind and offers hope to patients with chronic kidney disease.

" If we can find a way to provide new nephrons to an adult or increase nephron numbers in babies at birth, we could potentially reduce the risk of disease progression."

This landmark discovery was published today (10am AEST 14/06/13) in the Journal of the American Society of Nephrology, the world's leading nephrology journal.

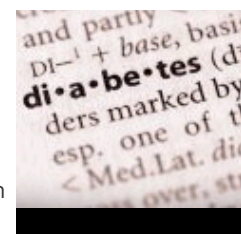
The cost of treating end-stage kidney disease from 2009-2020 estimated to be around \$12 billion to the Australian Government¹.

In 2010, 2257 new patients commenced treatment for end-stage kidney failure² in Australia, and tragically, 1574 Australians died during kidney replacement therapy³.

Professor Little said there was still more work to be done to encourage these reprogrammed early nephron cells to function and integrate.

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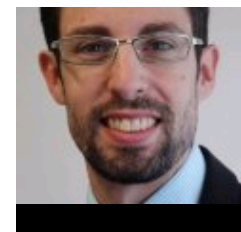


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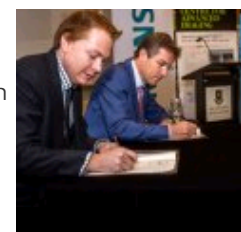
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" While this is a beginning, we hope it will inspire industry leaders and researchers around the world to invest further in cellular and bioengineering approaches to kidney repair and regeneration," Professor Little said.

Make a difference today by donating to IMB' s kidney research at www.imb.uq.edu.au/donate or (07) 3346 2132.

The Institute for Molecular Bioscience (IMB) is a research institute of The University of Queensland that aims to improve quality of life by advancing personalised medicine, drug discovery and biotechnology.

ENDS

High-res photos and interview opportunities with Professor Little are available on request.

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References:

1 Cass A, Chadban S, Gallagher M et al. The economic impact of end-stage kidney disease in Australia: Projections to 2020. Kidney Health Australia, Melbourne, Australia; 2010.

2 Grace, B. Hurst, K. and McDonald, S. The 24th Annual ANZDATA Report 2011 – Data to 2010. Chapter 2 – New Patients Commencing Treatment in 2010 (page 2). Australia & New Zealand Dialysis & Transplant Registry. Australia: 2012. Accessed 29 May via: http://www.anzdata.org.au/anzdata/AnzdataReport/34thReport/2011c02_newpatients_v1.5.pdf

3 McDonald, S. The 24th Annual ANZDATA Report 2011 – Data to 2010. Chapter 3 – Deaths (page 3). Australia & New Zealand Dialysis & Transplant Registry. Australia: 2012. Accessed 29 May via: http://www.anzdata.org.au/anzdata/AnzdataReport/34thReport/2011c03_deaths_v1.5.pdf

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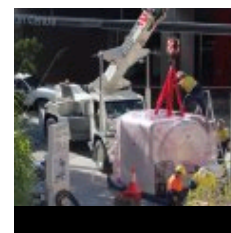
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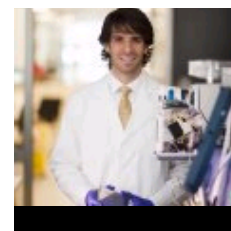
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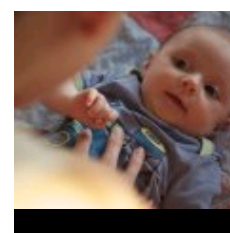
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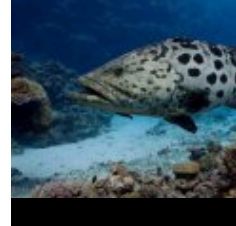
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