

Winding back the clock with kidney stem cells

May 16 2011

Stem cell research courts both controversy and support in the community- depending on your viewpoint.

Now, for the first time, scientists at Monash University's Immunology and Stem Cell Laboratories (MISCL) have shown that they can make human stem cells from healthy adult kidneys without working on [human embryos](#), circumventing ethical concerns around this research.

This achievement will allow group leader Associate Professor Sharon Ricardo and her team to model genetic kidney diseases in the laboratory and tease out the mechanisms that control these difficult-to-treat disorders.

"We're taking human kidney cells and winding back the clock to make their early precursors," Associate Professor Ricardo said.

For the challenging project, which was published in the *Journal of the American Society of Nephrology*, the Monash researchers started with healthy adult kidney cells, which they reprogrammed back to an embryonic-like state, then compared these kidney stem cells with off-the-shelf [embryonic stem cells](#), and showed that both could form different [embryonic tissue](#) types, with their [genetic features](#) preserved.

"These kidney cells had their slate wiped clean. Now that gives us the opportunity to change that kidney precursor into all kidney cell types," Dr Ricardo said.

In collaboration with Professor Peter Kerr from Monash Medical Centre, the research team has now generated four stem cell lines from patients with polycystic [kidney disease](#) and Alport syndrome, two leading genetic kidney disorders.

"As these stem cells can divide indefinitely in a culture dish, we can make a limitless source of patient-specific stem cells, make kidney cysts and screen drugs on those cells," Professor Kerr said.

"Our ultimate goal is to make off-the-shelf mature kidney cells that patients can use for drug testing and disease modelling."

Associate Professor Ricardo, who is approaching pharmaceutical companies to screen drugs on the kidney stem cells, believes that this personalised medicine approach will produce safer medicines in the future.

But in the short-term, the Monash researcher plans to continue work on the kidney stem cells to study how environmental factors influence how kidney cells behave, tests drugs for their ability to reduce kidney cyst formation and cell proliferation, and better understand how genetic kidney disorders develop in the first place.

Provided by Monash University

Citation: Winding back the clock with kidney stem cells (2011, May 16) retrieved 18 April 2024 from <https://medicalxpress.com/news/2011-05-clock-kidney-stem-cells.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.