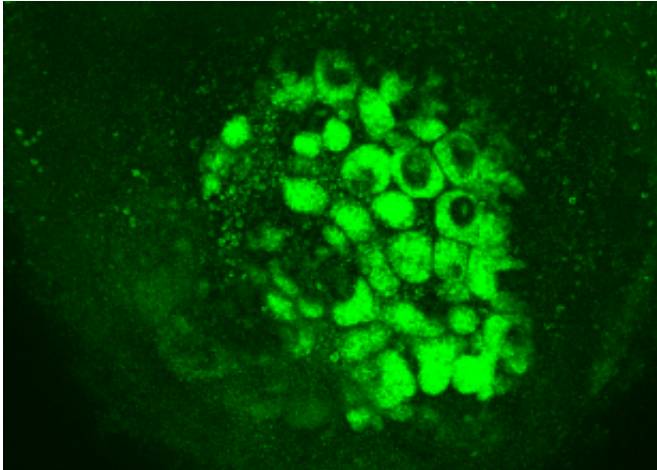


Stem cell-derived kidneys connect to blood vessels when transplanted into mice

19 November 2015



Kidney tissues with green fluorescence generated from human iPS cells. Credit: Nishinakamura

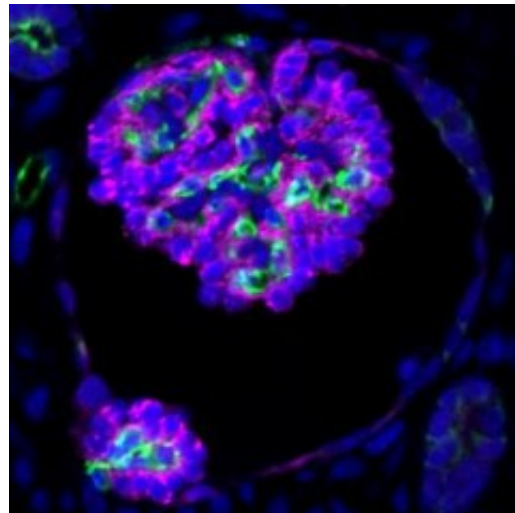
Various research groups are collecting different types of cells and turning them into induced pluripotent stem (iPS) cells that can then generate diverse types of cells and tissues in the body. Now investigators have transplanted kidney tissue made from human iPS cells into a mouse kidney, and they found that the animal's blood vessels readily connect to the human tissue. The advance, which marks an important step towards creating a urine-producing kidney through regenerative medicine, is described in a study appearing in an upcoming issue of the *Journal of the American Society of Nephrology (JASN)*.

In previous work, Ryuichi Nishinakamura, MD (Kumamoto University, in Japan) and his colleagues created 3-dimensional kidney structures from human iPS cells. In this latest work, by engineering the iPS cells to express green fluorescent protein so that they could be visualized and tracked, the researchers found that the iPS cell-derived kidney tissues were similar to those found normally in the body. Also, the team

successfully transplanted the kidney structures into the kidneys of mice, where they matured further around adjacent blood vessels and formed a filtration membrane structure similar to that of a normal kidney.

"We are now working to create a discharge path for the kidney and combine it with our findings," said Prof. Nishinakamura.

In addition to their potential for [regenerative medicine](#), such kidney structures may help scientists model [kidney development](#), investigate the causes of [kidney disease](#), and assess drugs' toxicity to the kidneys.



Human iPS cell-derived kidney glomeruli vascularized with host mouse endothelial cells, which line blood vessels. Credit: Nishinakamura

More information: The article, entitled "Human Induced Pluripotent Stem Cell-Derived Podocytes Mature into Vascularized Glomeruli upon Experimental Transplantation," will appear online at jasn.asnjournals.org on November 19, 2015.

Provided by American Society of Nephrology

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