ASN LEADING THE FIGHT AGAINST KIDNEY DISEASE

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Press Release

EMBARGOED FOR RELEASE until November 19, 2015– 5:00 PM (ET)

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STEM CELL–DERIVED KIDNEYS CONNECT TO BLOOD VESSELS WHEN TRANSPLANTED INTO MICE

Advance marks an important step forward in kidney regenerative medicine

Highlights

- After researchers transplanted kidney tissue generated from human induced pluripotent stem cells into a mouse kidney, the animal's blood vessels readily connected to the human tissue.

Washington, DC (November 19, 2015) — 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.

Study authors include Sazia Sharmin, PhD, Atsuhiro Taguchi, MD, Yusuke Kaku MSc, Yasuhiro Yoshimira MD, Tomoko Ohmori, Tetsushi Sakuma, PhD, Masashi Mukoyama, MD, Takashi Yamamoto, PhD, and Hidetake Kurihara, PhD.

Disclosures: The authors reported no financial disclosures.

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

Founded in 1966, and with nearly 16,000 members, the American Society of Nephrology (ASN) leads the fight against kidney disease by educating health professionals, sharing new knowledge, advancing research, and advocating the highest quality care for patients.

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