ASN LEADING THE FIGHT AGAINST KIDNEY DISEASE

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Press Release

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RESEARCH COMPARES MOUSE AND HUMAN KIDNEY DEVELOPMENT

Findings may lead to advances in the study and treatment of kidney disease.

Highlights

- Three new research articles compare human and mouse kidney development to identify shared and novel features.
- The studies provide new detailed molecular data to guide future research.
- The studies revealed deep conservation of certain processes, but also significant differences in gene expression during kidney development, as well as in the timing, scale, organization, and molecular profile of key cell types and cell structures.

Washington, DC (February 15, 2018) — Three new research articles compare human kidney development with a well-studied mouse model of kidney development to identify shared and novel features. The results, which appear in an upcoming issue of the *Journal of the American Society of Nephrology* (JASN), point to new avenues for research into the processes that direct cells to form functional kidney structures. In addition, the findings may help guide emerging stem cell–directed technologies to generate normal kidney structures for studying and treating human kidney disease.

The 3 research projects, all led by Andrew McMahon, PhD (Keck School of Medicine of the University of Southern California), looked at distinct aspects of kidney development in mice and humans, as well as the different types of cells involved. As a basis for their experiments, the researchers drew on mouse studies that have identified key regulatory mechanisms acting within and between different cell types to coordinate developmental programs. The team found deep conservation of certain processes that likely reflects similar underlying regulatory processes between mouse and man, but there were also significant differences in gene expression during kidney development, as well as in the timing, scale, organization, and molecular profile of key cell types and cell structures.

“We analyzed human kidney development, identifying features that distinguish our kidney from its well-studied mouse counterpart. The data bring an understanding of human kidney development to a new level,” said Dr. McMahon. “The information will guide

translational approaches to model and treat kidney disease, and engineer new kidney structures to restore kidney function."

Study co-authors differ for the 3 articles. The lead authors are Nils Lindström, PhD, Jill McMahon, Jinjin Guo, MD, Albert Kim, PhD, and Tracy Tran. Other co-authors include Qiuyu Guo, Elisabeth Rutledge, Riana Parvez, Guilherme De Sena Brandine, Gohar Saribekyan, Robert Schuler, Christopher Liao, Andrew Ransick, PhD, Ahmed Abdelhalim, Seth Ruffins, PhD, Matthew Thornton, Laurence Baskin, MD, Brendan Grubbs, MD, Andrew Smith, PhD, and Carl Kesselman, PhD.

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The articles, entitled "Conserved and divergent features of human and mouse kidney organogenesis," "Conserved and divergent features of mesenchymal progenitor cell types within the cortical nephrogenic niche of the mouse and human kidney," and "Conserved and divergent molecular and anatomical features of mouse and human nephron patterning," will appear online at http://jasn.asnjournals.org/ on February 15, 2018, doi: 10.1681/ASN.2017080887, doi: 10.1681/ASN.2017080890, and doi: 10.1681/ASN.2017091036.

Since 1966, ASN has been leading the fight to prevent, treat, and cure kidney diseases throughout the world by educating health professionals and scientists, advancing research and innovation, communicating new knowledge, and advocating for the highest quality care for patients. ASN has nearly 18,000 members representing 112 countries. For more information, please visit www.asn-online.org or contact the society at 202-640-4660.

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structures. In addition, the findings may help guide emerging stem cell–directed technologies to generate normal kidney structures for studying and treating human kidney disease.

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