

Research compares mouse and human kidney development

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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](#)."

More information: "Conserved and divergent features of human and mouse kidney organogenesis," [DOI: 10.1681/ASN.2017080887](https://doi.org/10.1681/ASN.2017080887)

"Conserved and divergent features of mesenchymal progenitor cell types within the cortical nephrogenic niche of the mouse and human kidney," [DOI: 10.1681/ASN.2017080890](https://doi.org/10.1681/ASN.2017080890)

"Conserved and divergent molecular and anatomical features of mouse and human nephron patterning," [DOI: 10.1681/ASN.2017091036](https://doi.org/10.1681/ASN.2017091036)

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