

SIGNIFICANCE STATEMENT

A poor understanding of human kidney development affects efforts to understand, model, and treat kidney disease. In this manuscript, we analyzed a large resource of human kidney samples from 4 to 23 weeks of development utilizing a variety of molecular and cellular approaches, comparing mouse and human developmental programs. A strong conservation was observed between human and mouse programs but significant differences were identified in the timing, scale, organization, and molecular profile of key cell types and composite cell structures. Together, the findings and data resource make human kidney development accessible to the biomedical community and will serve to guide translational efforts to engineer human kidney tissue.