

# This Month's Highlights

## SPECIAL ARTICLE

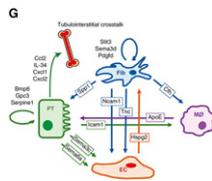
### State of Kidney Research

In a new systematic review, Kyriakos *et al.* assess the quantity of clinical trials and preclinical studies reported over the past 5 to 7 decades, as well as the quality of nephrology research reports published by leading journals in the past 2 decades. They find that although the numbers of clinical and preclinical studies have substantially increased with time, nephrology still lags behind other medical disciplines. Further, while the quality of clinical trial reporting has improved, many gaps persist in reporting quality of preclinical studies. Identifying such deficits may help improve kidney research and accelerate advances. See Tomidis *et al.*, pages 13–22.

## RAPID COMMUNICATION

### Single-Nucleus RNA Sequencing

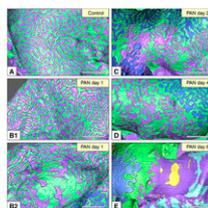
In the quest to better understand the complexity of cells, massively parallel single-cell RNA-sequencing technologies are proving to be powerful tools, but it has been unclear which platform is best suited to study adult kidney in health and disease. Wu *et al.* report that in addition to performing as well as single-cell RNA sequencing in quantifying gene expression, single-nucleus RNA sequencing has several advantages, including representation of rare or fragile kidney cell types, the ability to use archival frozen samples, elimination of dissociation-induced transcriptional stress responses, and successful performance on inflamed, fibrotic kidney. These findings will inform efforts to build a comprehensive single-cell atlas of healthy and diseased kidney. See Wu *et al.*, pages 23–32.



## BASIC RESEARCH

### New Imaging Approach Illuminates Foot Process Effacement

Although conventional scanning electron microscopy (SEM) is a useful method for exploring podocyte structures, it gives an incomplete view of the architecture of individual podocytes. To study changes during foot process effacement in diseased podocytes, Ichimura *et al.* analyzed injured rat podocytes reconstructed from serial, sectional images produced by focused ion beam/SEM tomography. The high-quality reconstructed images help clarify the three-dimensional morphological changes during foot process effacement, such as fragmentation, autacellular tight junctions, and retraction of the ridge-like prominence (an anchoring apparatus protruding from the basal surface of the cell body and primary process), providing greater detail than

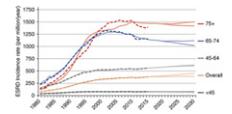


has been previously described based on conventional electron microscopy. See Ichimura *et al.*, pages 96–108.

## CLINICAL EPIDEMIOLOGY

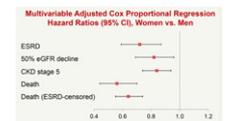
### ESKD in 2030

ESKD incidence adjusted for age, sex, and race leveled off and declined in the 2000s, a trend that led to speculation that the dramatic increase in incidence rates through the 1980s and 1990s may have stabilized. However, using a simulation model, McCullough *et al.* find that despite decreasing rates within age and race groups, the aging population and changes in the racial distribution of the population will result in increasing crude ESKD incidence rates and annual numbers of new cases. They predict that these factors, along with decreasing ESKD death rates, will lead to a substantial increase in the prevalent ESKD population by 2030—a prediction with important implications for dialysis infrastructure planning and Medicare and Medicaid budgeting. See McCullough *et al.*, pages 127–135.



### Sex-Related Differences in CKD Progression

For reasons that are not well understood, although women are more likely than men in the United States to have CKD, men are 1.5 times more likely to have the condition progress to ESRD. In their evaluation of data from 3939 adults enrolled in the Chronic Renal Insufficiency Cohort Study, a large and diverse CKD cohort, Ricardo *et al.* find that women have a lower risk of ESRD and death from any cause compared with men, and these differences remained statistically significant even after adjustment for demographic and clinical factors. See Ricardo *et al.*, pages 137–146.



## CLINICAL RESEARCH

### Predicting Postoperative AKI Risk Before Noncardiac Surgery

Postoperative acute kidney injury (PO-AKI) is associated with increased risks of death and persistent renal failure. In a retrospective cohort study of patients who underwent noncardiac surgery at two Korean tertiary hospitals, Park *et al.* developed the Simple PO-AKI Risk (SPARK) index (based on the sum of risk scores for age, sex, baseline eGFR, albuminuria, and seven other variables), identified cutoff points in the index to define four risk classes, and showed in a validation cohort that these classes fairly reflected risk of PO-AKI-related outcomes. Although further validation is needed for generalized use, clinicians may consider using the index before noncardiac surgery to stratify patients' PO-AKI risks. See Park *et al.*, pages 170–181.