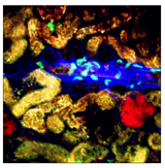
This Month's Highlights

BASIC RESEARCH

Re-evaluating Renal Dendritic Cells



Markers previously thought specific for dendritic cells (DCs) are actually expressed by a variety of myeloid cells. Here, Brähler *et al.* report findings from their re-evaluation of renal DCs using newer, highly specific DC markers. Multiphoton imaging and imaging mass cytometry revealed that renal DCs are round and sparsely localized in the interstitium, and show striking motility with activation. In mice with nephrotoxic nephritis, DCs accumulate in the periglomerular region. Gene expression studies support the specificity of the newer markers. Notably, the main subset of $CD11b^+$ DCs have proinflammatory effects, whereas the smaller subset of $CD103^+$ DCs control inflammation. This crucial update regarding the role of DCs in glomerular inflammation is likely to have therapeutic relevance. *See Brähler et al., pages* 138–154.

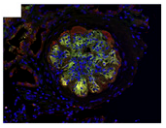
CLINICAL EPIDEMIOLOGY

Air Pollution and Kidney Disease

The impact of air pollution on CKD and ESRD is not known. Bowe *et al.* analyzed data from a large cohort of United States (U.S.) veterans and found a linear relationship between exposure to particulate matter pollution less than 2.5 μm (<2.5 μm; $PM_{2.5}$) and risk of incident CKD or progression to ESRD. The study provides a quantitative assessment of the U.S. burden of CKD and ESRD attributable to $PM_{2.5}$ and establishes such air pollution as an important risk factor. Notably, risk begins to increase at $PM_{2.5}$ concentrations below those recommended by the World Health Organization and the Environmental Protection Agency. These findings contribute to understanding the geographic variation in burden of CKD in the U.S. and globally. Further studies should determine whether exposure to $PM_{2.5}$ has a direct and causal link to the progression of CKD. *See Bowe et al., pages* 218–230.

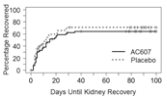
CLINICAL RESEARCH

Novel Biomarker for Fibrillary GN



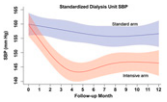
Fibrillary GN (FGN) is a primary glomerular disease for which specific histologic biomarkers are needed. In this issue, reports by Andeen *et al.* and Dasari *et al.* describe the discovery, using proteomics, of a potential biomarker of FGN, DnaJ heat shock protein family (Hsp40) member B9 (DNAJB9). Studies from both groups demonstrate overabundance of DNAJB9 in FGN glomeruli, but not in glomeruli from patients with other glomerular diseases or from healthy subjects. On the basis of these findings, the authors propose that DNAJB9 may be an autoantigen in FGN. The value of DNAJB9 as a diagnostic and therapeutic target for FGN warrants investigation. *See Andeen et al., pages* 231–239, and *Dasari et al., pages* 51–56.

Mesenchymal Stem Cells for Postoperative AKI



Preclinical studies have indicated the promise of cell-based therapies for improving functional recovery from AKI after cardiac surgery. In this issue, Swaminathan *et al.* report on their phase 2, randomized, double-blind, placebo-controlled trial of intra-aortic administration of allogeneic human mesenchymal stem cells in 156 adults with early postoperative AKI. Time to kidney recovery and rates of dialysis, 30-day mortality, and adverse events did not differ between groups. Potential factors underlying the discrepancy between these results and those of preclinical studies may inform future studies of this novel approach to therapy of renal diseases. *See Swaminathan et al., pages* 260–267.

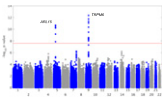
Intensive BP Control in Hemodialysis Patients



What is the optimal BP target for patients on hemodialysis? Miskulin *et al.* conducted a pilot study in 126 hemodialysis patients with hypertension randomized to a predialysis systolic BP of 110–140 mmHg (intensive) or 155–165 mmHg (standard) for 1 year. A separation of 12.9 mmHg across arms was sustained in months 4–12. This study was not powered for definitive conclusions, but hospitalizations, vascular access thromboses, and major adverse cardiovascular events occurred more often in the intensive arm, raising concern of a possible safety signal. These findings indicate that a larger trial is feasible and necessary to fully evaluate the effects of intensive BP lowering in this population. *See Miskulin et al., pages* 307–316.

META-ANALYSIS

Understanding the Link between Mg^{2+} Homeostasis and Metabolic Disorders



Abnormal Mg^{2+} levels are associated with diabetes and metabolic disorders. To assess the genetic factors regulating Mg^{2+} homeostasis, Corre *et al.* conducted a meta-analysis of genome-wide association studies in European populations. Two significant loci strongly associated with urinary Mg^{2+}: the *TRPM6* gene, which encodes a Mg^{2+} channel, and the *ARL15* gene, which encodes a GTP-binding protein. Further studies in human kidney cells showed that ARL15 regulates TRPM6 channel activity. In zebrafish, dietary Mg^{2+} regulates the expression of *arl15b*, knockdown of which leads to renal Mg^{2+} wasting and metabolic disturbances. Thus, a gene-diet interaction may contribute to the link between Mg^{2+} homeostasis and metabolic disorders. *See Corre et al., pages* 335–348.