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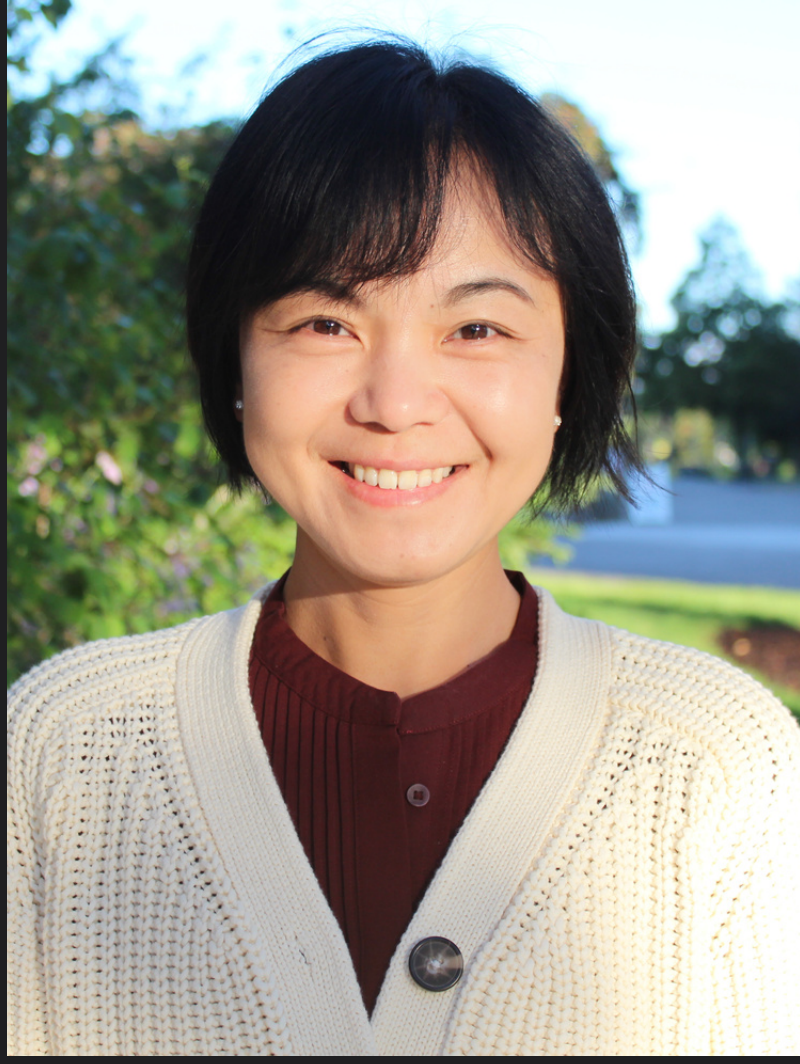


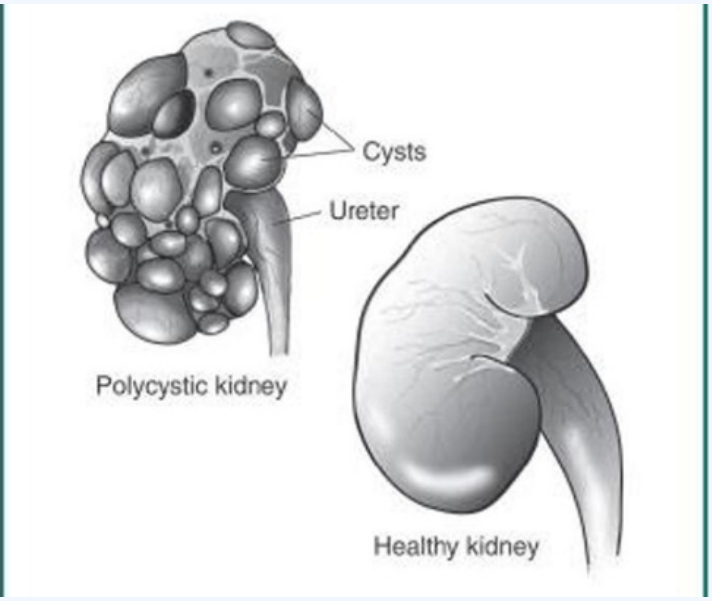
Research Interests

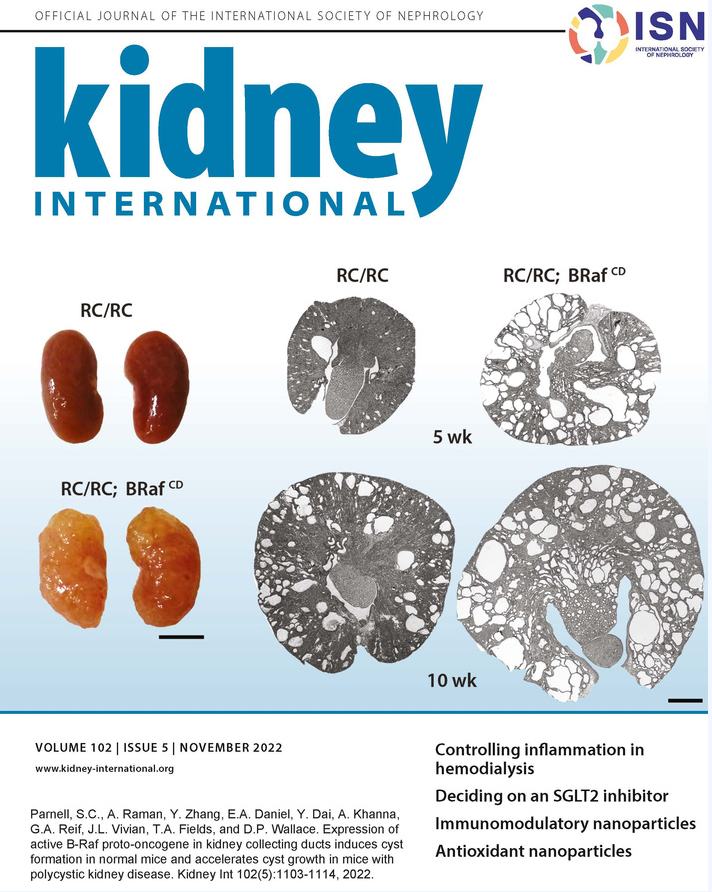
- Pathological mechanism and potential therapy for polycystic kidney disease
- Artificial intelligence for kidney disease study
- Neuromorphic robotic system for spatial memory study

Links of Interest

Institute of Computing and Cybersystems

Research Synopsis





Autosomal dominant polycystic kidney disease (ADPKD) is the most common, potentially lethal genetic disorder characterized by the progressive enlargement of numerous fluid-filled cysts and the development of interstitial inflammation and fibrosis. ADPKD is caused by the mutations of PKD1 or PKD2 gene which encode polycystin-1 and -2, respectively. Approximately 50% of patients progress to end-stage renal disease by middle age and require dialysis or renal transplantation. Currently, treatment options for ADPKD patients are limited; thus, the development of new effective therapies is urgent. Dr. Zhang's research lab investigates the role of innate immunity in the pathological microenvironment of ADPKD and the potential therapeutic effects of manipulating innate immunity. Also, Dr. Zhang's lab is interested in determining the structure and function of polycystin-1 and polycystin-2 using deep learning.

Recently, Dr. Zhang collaborated with Dr. Hongyu An in the ECE department to study spatial memory using a novel neuromorphic robotic system. This project will utilize a neuromorphic robotic system to investigate the intricate working of spatial memory in the hippocampus, a critical brain region responsible for spatial memory and navigation.

[ICC] Institute of Computing and Cybersystems

For more information

Publications