

Yan Zhang

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Sciences



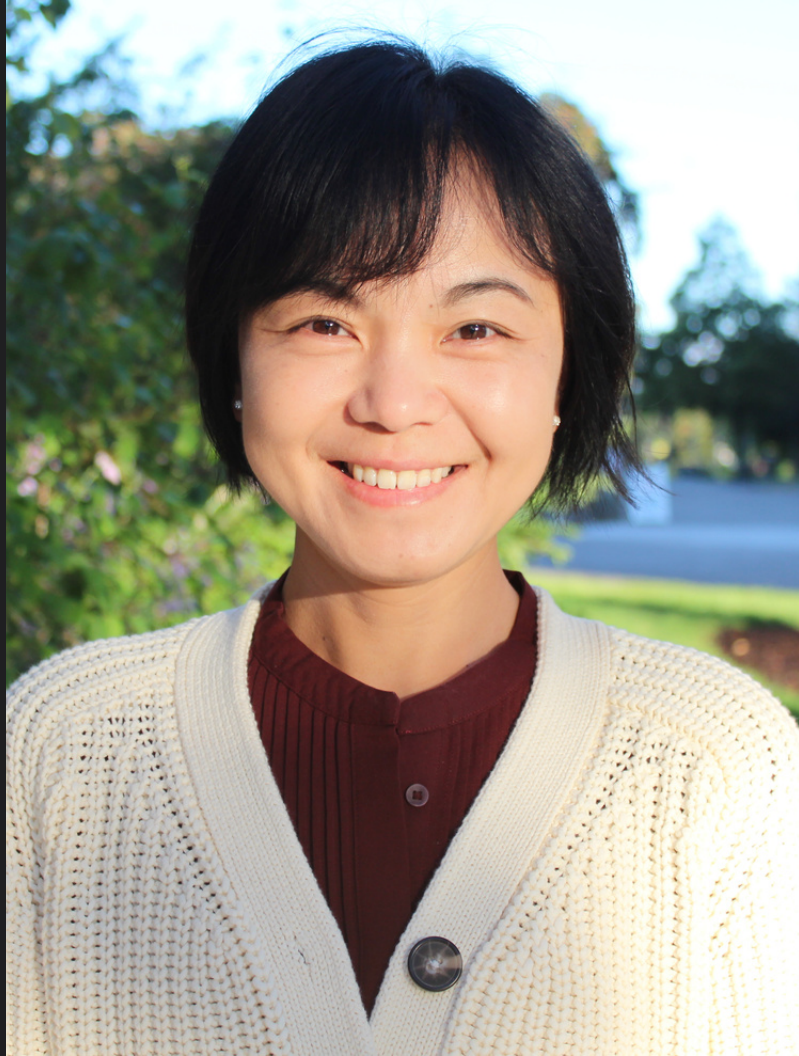
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Research Interests

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



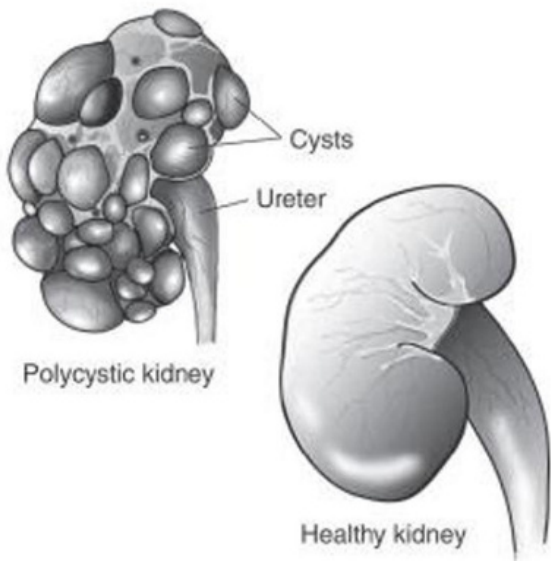
Links of Interest



[Institute of Computing and Cybersystems](#)



Research Synopsis



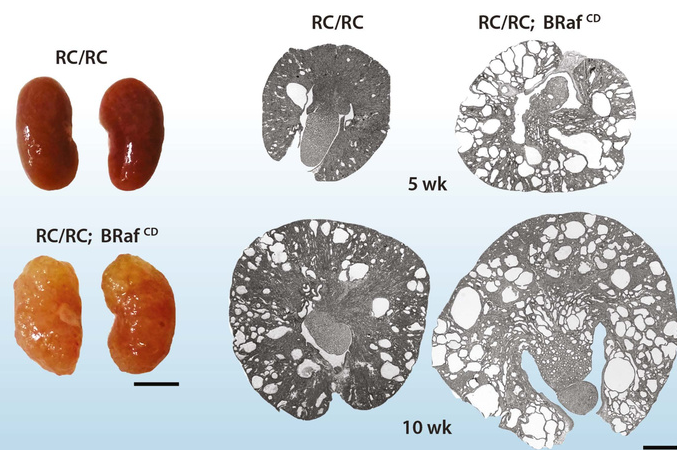
Autosomal dominant polycystic kidney disease (ADPKD) is the most common, potentially lethal genetic disorder characterized by the progressive enlargement of numerous fluid-filled cysts and the development of interstitial inflammation and fibrosis. ADPKD is caused by the mutations of PKD1 or PKD2 gene 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.

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kidney

INTERNATIONAL



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Parnell, S.C., A. Raman, Y. Zhang, E.A. Daniel, Y. Dai, A. Khanna, G.A. Reif, J.L. Vivian, T.A. Fields, and D.P. Wallace. Expression of active B-Raf proto-oncogene in kidney collecting ducts induces cyst formation in normal mice and accelerates cyst growth in mice with polycystic kidney disease. *Kidney Int* 102(5):1103-1114, 2022.

Controlling inflammation in hemodialysis
Deciding on an SGLT2 inhibitor
Immunomodulatory nanoparticles
Antioxidant nanoparticles

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