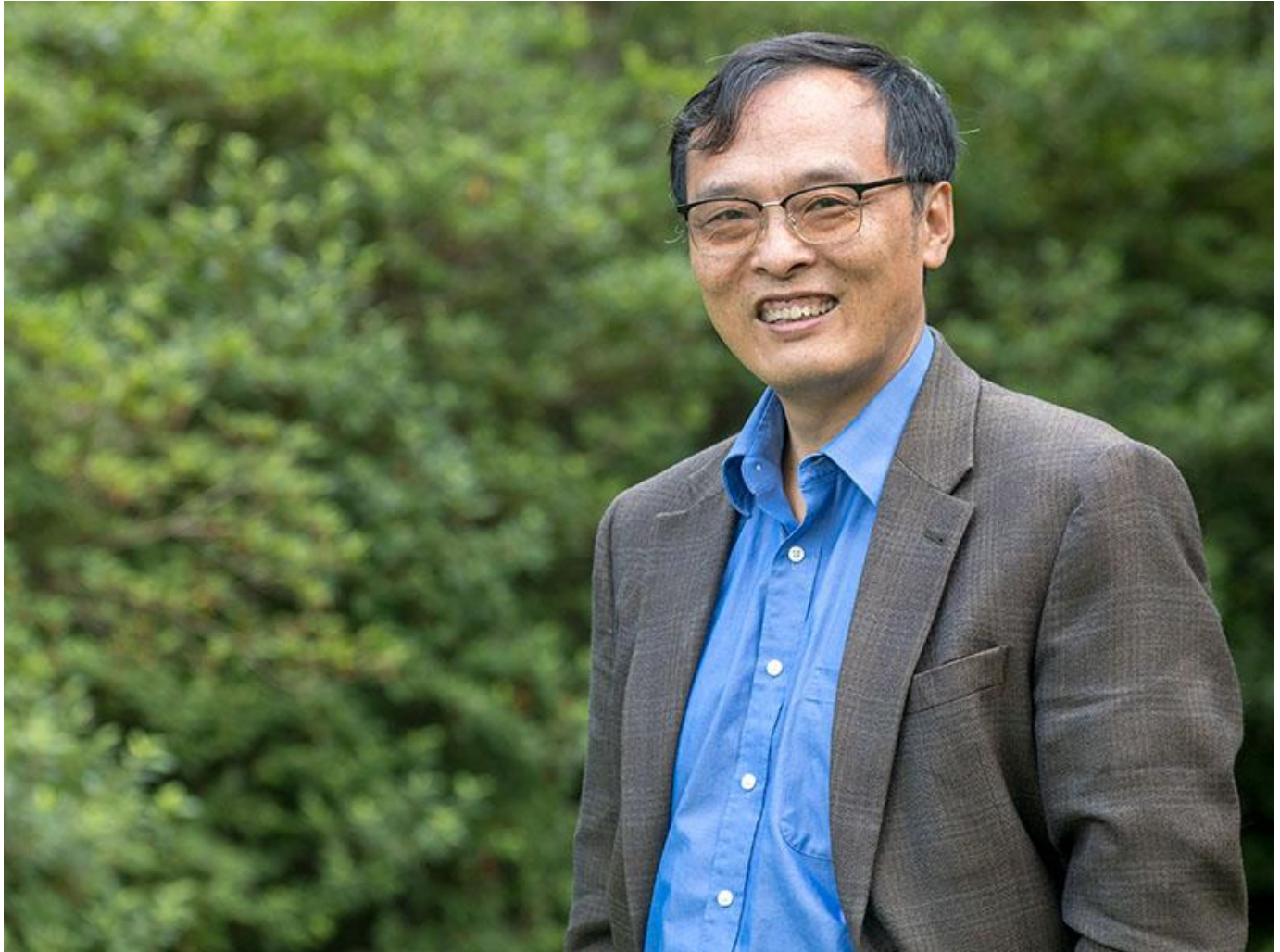


Tulane researchers discover new type of kidney cells key to fighting infection

Keith Brannon

kbrannon@tulane.edu



Dr. Xuebin Qin is a professor of medicine at Tulane National Primate Research Center.

Macrophages are a type of white blood cell central to the immune system. They detect harmful pathogens – viruses, bacteria, and fungi – and engulf them, serving as helpful scavengers to keep infections at bay. They also cause or suppress inflammation and secrete molecules that allow communication between different cell types, all which provide a healthy immune response in fighting any infection or disease.

For years, scientists have known the origins of different types of macrophages found in the brain, gut, heart, and liver. But the origins of those found in kidney tissue have long eluded researchers who didn't know if these had traveled from elsewhere in the body or if they were produced during embryonic development. It turns out that both theories are correct.

[In a new study in *Nature Communications*](#), Tulane researchers Dr. Xuebin Qin, professor of medicine, and Dr. Fengming Liu, assistant professor of microbiology and immunology, published their findings on the origin, dynamics and fate of renal macrophages – a discovery which fundamentally changes our understanding of how these vital cells populate.

Using a new rapid cell ablation technique created by Qin, his team discovered that in a mouse model, half of renal macrophages originate during the embryonic state and the other half derive from bone marrow. Further, they demonstrated that embryo-derived renal macrophages have a stronger immune response than their bone marrow-derived counterparts.

“These findings advance our current understanding of tissue-resident macrophages and may lead to promising new directions for the development of new therapeutics for kidney diseases,” said senior study author Qin.

The implications of this discovery are vast. The kidneys help control the volume of blood in the body and maintain the proper concentrations of proteins and electrolytes. Yet, they are subject to infection and disease. The role of macrophages in clearing any infection and supporting kidney function could prove key to future treatments.

Tulane National Primate Research Center Director Dr. Jay Rappaport collaborated with Qin on this research. “The functionality of the entire body depends on the health of the kidneys,” said Rappaport. “Discovering renal macrophages opens up a new field of research and could have far-reaching implications – not only for kidney disease but for the treatment of infectious diseases like HIV and COVID-19, both of which are associated with renal failure.”

Qin and his team at the Tulane National Primate Research Center collaborated with multiple teams at the Tulane School of Medicine, the National Institute of Alcohol Abuse and Alcoholism, and Temple Medical School on this study.