

Sensing danger signals in the kidney may help acute kidney disease

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Latest research from the Centre for Inflammatory Diseases at the School of Clinical Sciences at Monash Health provides novel insights into how the body's danger signals work to protect against inflammation, potentially paving the way to improved outcomes for people with acute kidney injury.

Published this week in the internationally top-ranking *Journal of the American Society of Nephrology*, postdoctoral scientist Dr Maliha Alikhan's study helps us understand how toll-like receptors (TLRs) work in [inflammation](#) and in [acute kidney injury](#) (AKI).

AKI is a major cause of morbidity and mortality for hospitalised patients throughout the world.

In a world-first, Dr Alikhan has characterised and defined an unexpected protective role of the protein Toll-like receptor 9 (TLR9) in inflammation that results in AKI.

"Our research used a model of a very common form of kidney disease, where disease onset is often predictable and develops after medical procedures and therapies," said Dr Alikhan.

"We found that TLR9, that senses danger signals, limits [kidney injury](#) by helping protective cells called regulatory T cells move to the kidney to limit damage."

Helping regulatory cells move to sites of inflammation could be a more specific way of treating [inflammatory diseases](#) and AKI.

"Our findings were new and quite unexpected," added Dr Alikhan.

"The thinking has been these toll-like receptors sense danger in the body and tend to promote inflammation to increase tissue injury. We have found that for TLR9, the opposite occurs in AKI."

This improved understanding and novel insight into both how TLR9 works in the body and the mechanisms of AKI could lead to new therapeutic applications that improve patient outcomes.

"This project was built on the work of the late Dr Shaun Summers, an esteemed Monash University clinician researcher and it has been gratifying to publish it in a high impact journal," said Dr Alikhan.

More information: "Endogenous Toll-Like Receptor 9 Regulates AKI by Promoting Regulatory T Cell Recruitment" *JASN* ASN.2014090927; published ahead of print June 26, 2015, [DOI: 10.1681/ASN.2014090927](https://doi.org/10.1681/ASN.2014090927)

Provided by Monash University

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