

Study into chronic kidney disease biomarkers will improve early detection and treatment



Dr Monica Ng, resident medical officer

Acute kidney injury (AKI) affects one third of people admitted to hospital with the life-threatening complications of chronic kidney disease and kidney failure.

Currently, clinicians don't have the tools to objectively identify people at high risk of chronic kidney disease (CKD) or kidney failure after AKI, who would most benefit from intensive follow-up and preventative therapy.

A study by Accredited Trainee and 2022 Avant Early Career Research Program grant recipient, Dr Monica Ng is using cutting edge molecular technologies to discover new methods of identifying early the people most at risk of kidney failure.

"I am investigating nanoparticles in the urine, known as extracellular vesicles or EVs, as a potential marker for risk of progressing to CKD or kidney failure after AKI. I aim to develop a non-invasive test that can be used in the clinic, or at the bedside, to identify patients most at risk of adverse outcomes so we can treat them early and prevent kidney failure," she explains.

The study will also determine the feasibility and sample size required for a large-scale study to prospectively validate urinary EV profiling to predict AKI to CKD transition.

Preliminary findings pave the way for future clinical trial and integration into clinical practice

The research is conducted at the Royal Brisbane and Women's Hospital, under the supervision of pre-eminent Nephrologist, Associate Professor Helen Healy and Senior Research Scientist, Dr Andrew Kassianos. Dr Ng's study expands their work into the diagnostics' field, developing a hypothesis generated from her previous studies.

"Our pre-clinical results support the hypothesis that the cargo carried by urinary EVs varies depending on kidney disease state. The results will provide preliminary data for a clinical trial to validate the sensitivity and specificity of urinary EVs for AKI prognostication. Urinary EVs have potential biomarker functions, identifying patients at high risk of AKI to CKD transition in the clinical setting," she says.



My research fills a gap by developing a non-invasive test to predict patients' risk of poor outcomes after an episode of acute kidney injury so we can personalise their care."

Support for research is foundational to skills development and future studies

Dr Ng will use the Avant funding to purchase equipment and hire research staff.

"It is fantastic to see interest in my work and recognition of its potential to impact diagnostic testing in kidney disease," she says. "The Early Career Research Program provides an excellent opportunity for junior doctors to undertake research while completing their clinical training."

In 2023, Dr Ng will undertake her final year of advanced training in nephrology to become a kidney specialist, and continue her postdoctoral work, supported by the Avant grant.