Hyperspectral and Brightfield imaging to diagnose kidney diseases

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DIAGNOSTIC

Opportunity
To date, there are no markers for early kidney disease detection, and clinical symptoms or abnormalities related to chronic kidney disease (CKD) are noticeable only when patients lose around 90% of kidney function, at which stage CKD is irreversible. A recent global burden of diseases report suggest that CKD will likely become the fifth leading cause of death globally by 2040. Epidemiological studies estimate the number of total prevalent cases of stage I–IV CKD disease in major markets to grow from ~106 million cases in 2020 to ~115 million cases by 2026.

This invention provides a one-of-a-kind, non-invasive and cost-effective method of diagnosing CKD by examining renal ex-foliated cells in urine. This can further be used for monitoring the progression of the disease and treatment therapies in real time.

Technology
Our highly experienced researchers have developed sensitive methods to extract and examine urinary exfoliated kidney cells.

Subjecting these urinary exfoliated proximal tubule cells to comprehensive high-content imaging we can probe the cellular morphology over the course of a chronic disease using our adaptations to the following techniques:

a) hyperspectral imaging, and
b) brightfield imaging.

Potential Commercial Applications
Non-invasive diagnostic tool for:
– identification of patients with early CKD and/or patients at risk of disease progression.
– identification of mild changes in renal function and pathology.
– monitoring the effect of drugs on the kidneys.

Intellectual Property Status
Both the hyperspectral and brightfield aspects of the invention are protected by separate Australian provisional patents.

Scientific Information
Additional data and information is available at:
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Inventors
Development of these techniques was led by the highly experienced teams of:
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