

Identifying key regulators of kidney injury

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(Medical Xpress)—Micro-RNAs (miRNAs) are a recently discovered class of RNA molecules that regulate how genes are expressed. UCD researchers led by Conway Fellow, Professor Catherine Godson are studying the role of miRNAs in diabetic kidney disease.

They have described for the first time how the miRNA family, let-7 miRNA, plays a key role in regulating kidney injury by targeting key fibrosis pathways in human kidney epithelial cells.

The team investigated the miRNA responses in human kidney tubule epithelial cells cultured under fibrotic conditions that mimic [diabetic kidney disease](#) and in the presence of anti-[inflammatory mediator](#) lipoxin A4 to suppress fibrosis.

'Promoting the resolution of inflammation makes for an interesting [therapeutic approach](#) that could reduce the risk of developing diabetic kidney disease. We believe that the lipoxins involved in regulating this process may be acting through miRNA mechanisms', said Dr Eoin Brennan, first author of the published article in the *Journal of the American Society of Nephrology*.

The extent of let-7c miRNA expression seems to impact on the integrity of epithelial cells as the study found less let-7c miRNA expression in injured epithelial cells than in healthy cells.

'The next step for us now is to determine if let-7 miRNAs can actually play a role as biomarkers of diabetic kidney disease and we will do this

by measuring expression in both urine and [kidney biopsies](#) of patients,' said Professor Catherine Godson from UCD School of Medicine & Medical Science.

'We will also investigate the therapeutic potential of let-7c delivery to the kidney in experimental models of disease. These studies will further enhance our understanding of the role of [miRNA](#) in diabetic kidney disease as both biomarkers and potential novel therapeutic targets.'

The global prevalence of diabetes is predicted to reach 4.4% by 2030, an approximate doubling of the levels in 2000. Up to 40% of patients with diabetes (type 1 and type 2) will develop kidney damage. There is a significant unmet clinical need for sensitive and specific biomarkers of disease progression and effective treatments for diabetic kidney disease.

More information: Brennan, E. et al. Lipoxins attenuate renal fibrosis by induction of let-7c and suppression of TGF β R1. *Journal of the American Society of Nephrology*, 2013 (24(4):627-637).

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