

Researchers find new enzyme regulation process that may influence kidney health

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Associate Professor Francine Marques, a National Heart Foundation Future Leader at the Monash University School of Biological Sciences. Credit: Monash University

A recent study led by Monash University researchers has identified a new mechanism for the regulation of angiotensin-converting enzyme 2 (ACE2) – an important enzyme for regulating kidney health during high blood pressure.

Associate Professor Francine Marques from the Monash University School of Biological Sciences led the research, which is published in the journal *Hypertension*.

Associate Professor Marques, a National Heart Foundation Future Leader Fellow, was recently awarded the Gottschalk Medal by the Australian Academy of Science for her work on high blood pressure and [cardiovascular disease](#). She is a finalist for the Women's Agenda Emerging Leader in STEM Award announced recently.

"We have identified a new mechanism for regulation of ACE2 in the kidneys that involves our gut microbes," Associate Professor Marques said.

"We discovered that high fiber intake increases the levels of the ACE2 in the kidneys via molecules produced by gut microbes when we feed mice fiber," she said.

"By using mouse models that lack receptors that sense these molecules, we were able to pinpoint a possible mechanism of how gut microbes communicate with the host's kidney."

ACE2 has received a lot of interest lately as it acts as the receptor for the SARS-CoV-2 virus. However, ACE2 is also protective against kidney damage.

"By increasing ACE2 levels in the kidney with fiber intake, we may aid in the prevention against renal disease," Dr. Matthew Snelson, first author of the study, said.

Scientists are now investigating whether these same substances produced by [gut microbes](#) when we eat fiber can help lower blood pressure in people.

To achieve this they are conducting a phase II randomized clinical trial—believed to be the first of its kind in the world.

"This is a really exciting trial which could lead to an alternative therapy for those living with [high blood pressure](#) and help to prevent the development of [kidney](#) disease," Associate Professor Marques said.

More information: Matthew Snelson et al. Renal ACE2 (Angiotensin-Converting Enzyme 2) Expression Is Modulated by Dietary Fiber Intake, Gut Microbiota, and Their Metabolites, *Hypertension* (2021). [DOI: 10.1161/HYPERTENSIONAHA.121.17039](#)

Provided by Monash University

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