

Asthmatics may soon breathe easier thanks to new breakthrough

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New research led by Edith Cowan University has made an important discovery that could lead to more effective treatments for the world's 262 million asthma sufferers.

A study led by Dr. Stacey Reinke (ECU) and Dr. Craig Wheelock (Karolinska Institute, Sweden) found severe asthmatics have a distinct biochemical (metabolite) profile detectable in their urine, compared to mild-to-moderate asthmatics and healthy individuals.

Researchers analyzed [urine samples](#) from more than 600 participants across 11 countries as part of the U-BIOPRED study, a Europe-wide initiative to identify and better understand different sub-types of severe asthma.

The research team discovered a specific type of metabolite, called carnitines, decreased in severe asthmatics.

Carnitines play an important role in cellular energy generation and immune responses.

Further analyses found carnitine metabolism was lower in severe asthmatics.

These new findings will help enable researchers work towards new, more effective therapies for asthmatics.

A big problem for a lot of people

Dr. Reinke, from ECU's Center for Integrative Metabolomics and Computational Biology, said it is vital asthma [treatment](#) is improved.

"Asthma affects 2.7 million Australians and there were 417 asthma-related deaths in Australia in 2020," she said.

"Severe asthma occurs when someone's asthma is uncontrolled, despite being treated with high levels of medication and/or multiple medications.

"To identify and develop new treatment options, we first need to better understand the underlying mechanisms of the disease."

One way to do this is to examine the body's chemical profile, or 'metabolome', which provides a snapshot of a person's current physiological state and gives useful insight into disease processes.

"In this case, we were able to use the urinary metabolome of asthmatics to identify fundamental differences in [energy metabolism](#) that may represent a target for new interventions in asthma control," Dr. Reinke said.

Can urine really tell us what is happening in the lungs?

Dr. Reinke said it can be difficult and invasive to investigate the lungs directly—but fortunately they contain a lot of blood vessels.

"Therefore, any biochemical changes in the lungs can enter the [blood stream](#), and then be excreted through the urine," she said.

"These are preliminary results, but we will continue to investigate carnitine metabolism to evaluate its potential as a new asthma treatment target."

"Urinary metabotype of severe [asthma](#) evidences decreased carnitine metabolism independent of oral corticosteroid treatment in the U-BIOPRED study" was published in the *European Respiratory Journal*.

More information: Stacey N. Reinke et al, Urinary metabotype of severe asthma evidences decreased carnitine metabolism independent of oral corticosteroid treatment in the U-BIOPRED study, *European Respiratory Journal* (2021). [DOI: 10.1183/13993003.01733-2021](https://doi.org/10.1183/13993003.01733-2021)

Provided by Edith Cowan University

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