

Bitter taste receptors hold key to treating asthma

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One in nine Australians, among more than 300 million people worldwide, suffer from asthma. They experience a wide range of debilitating, even life-threatening respiratory symptoms from a disease that can be controlled but not cured.

New research led by Dr Pawan Sharma from the UTS School of Life Sciences and The Woolcock Institute of Medical Research offers hope

to asthmatics who need more effective, long-term treatment plans.

Dr Sharma, and a team of American researchers, investigated whether the activation of [bitter taste receptors](#) could mitigate the features of [asthma](#) in mice.

They found the bitter substances not only reduced common symptoms of the disease in mice, but also prevented allergic inflammation and structural changes to the airways.

"We do not have an effective anti-asthma therapy that targets disease progression. Our current research on taste receptors is crucial in identifying new classes of drugs that can be an effective asthma treatment option in future," Dr Sharma said.

The research team induced mice with [allergic asthma](#) and tested the effects of chloroquine and quinine on various features of the disease. Chloroquine and quinine are substances that stimulate bitter taste receptors. Both are used as anti-malaria drugs and as flavouring for tonic water.

"We used both in vitro and in vivo approaches using human airway cells and mouse models of asthma to study the effectiveness of novel bitter compounds," Dr Sharma said.

The research team discovered chloroquine and quinine prevented development of asthma and reversed key disease symptoms in [mice](#).

In 2015, a [report](#) commissioned by Asthma Australia and the National Asthma Council found that the disease is costing the country \$27.9 billion per annum. Of this, \$24.7 billion accounts for "burden of [disease](#)" costs, that is, spending associated with the suffering and premature deaths experienced by asthmatics. While current anti-asthma medication

provides immediate relief, it does not deter structural changes to the airways, inflammation and mucus production.

Dr Sharma is now preparing to collaborate with US researchers to synthesise new bitter compounds that may be developed as inhaled therapy for humans.

More information: Pawan Sharma et al. Bitter Taste Receptor Agonists Mitigate Features of Allergic Asthma in Mice, *Scientific Reports* (2017). [DOI: 10.1038/srep46166](https://doi.org/10.1038/srep46166)

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