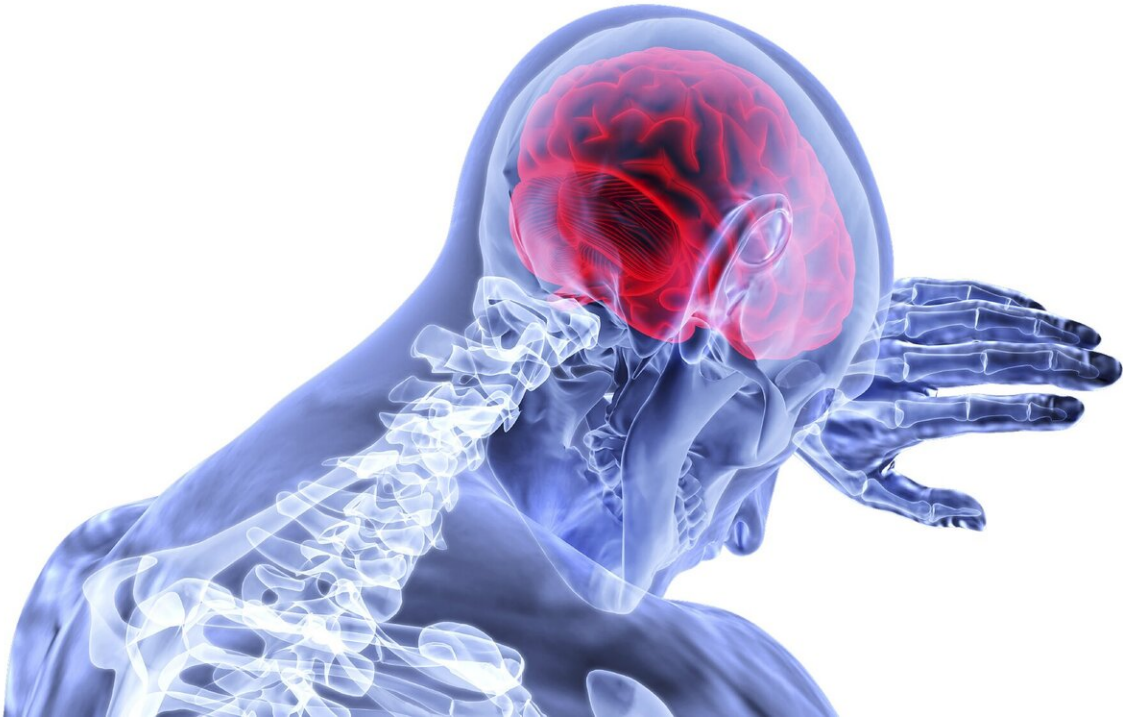


Flicking the inflammation off-switch

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In a long-term collaboration between researchers and industry, an exciting first step has been made in the creation of a new generation of medicines for auto-immune diseases using one of our body's own anti-inflammatory off-switch molecules.

The immune system produces many highly potent anti-inflammatory

molecules, but they are often fragile, short-lived, and lack drug-like properties. Interleukin-37 is one such molecule produced by the body to turn off inflammation.

Together with partner F. Hoffmann-La Roche (Roche), the multidisciplinary research team from Hudson Institute of Medical Research, Monash University Biomedicine Discovery Institute (BDI) and Monash University's Department of Paediatrics has harnessed their Fc-fusion platform to engineer the next generation of Interleukin-37, one that retains anti-inflammatory potency, is highly stable and has an excellent therapeutic likeness.

The findings from the research collaboration have now been published in *Cell Chemical Biology*.

Engineering the next generation of anti-inflammatories

Associate Professor Claudia Nold at the Hudson Institute of Medical Research, one of the lead scientists, says that "Working in the field of inflammation, we were delighted to partner with Roche, a Swiss pioneer in healthcare since 1896. Our collaboration between academia, clinicians and industry partners such as Roche enabled us to leverage our combined expertise and solve biomedical questions to get a step closer in developing innovative medicines for patients suffering from inflammatory diseases."

A little bit of inflammation can be a good thing and is often the body's immune system doing its job. However, when inflammation persists, or the immune system starts attacking the body's own cells, this can lead to disease. This research aims to create a new generation of medicines for auto-immune diseases.

Diseases characterized by too much inflammation

Another of the study's lead authors, Dr Andrew Ellisdon from the Monash BDI, says many human diseases, including autoimmune conditions such as arthritis, lupus or inflammatory bowel disease, are characterized by too much inflammation.

Dr Ellisdon says there has been a gap in producing new generations of potent anti-inflammatory therapeutics for these anti-inflammatory conditions.

"The past five years have been a remarkable opportunity to collaborate and learn from Roche, a global leader in the engineering and development of biologics. Because of the data from this study, we now know how to make more stable and medicine-like versions of the body's own anti-inflammatory off-switches," he said.

"This study builds a solid platform to test IL-37-based Fc-fusion variants in a range of preclinical models of inflammatory and autoimmune disease. We anticipate that many of the steps undertaken in this Fc-engineering platform will be broadly applicable to other challenging and unstable biologics."

Professor Marcel Nold, a Professor of Paediatric Immunology at Monash University and a consultant Neonatal Paediatrician at Monash Children's Hospital, said "It is a clinician scientist's ultimate goal to be part of research that can be translated into future patient treatments."

More information: Alexander Bujotzek et al, Protein engineering of a stable and potent anti-inflammatory IL-37-Fc fusion with enhanced therapeutic potential, *Cell Chemical Biology* (2021). [DOI: 10.1016/j.chembiol.2021.10.004](https://doi.org/10.1016/j.chembiol.2021.10.004)

Provided by Hudson Institute of Medical Research

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