

Elusive protein may lead the fight against inflammatory disease

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A husband and wife research team from Melbourne, Australia, have identified a protein that may be a key therapy for many inflammatory diseases, including those affecting premature babies.

In the October edition of [Nature Immunology](#), Drs Marcel and Claudia Nold, from the Monash Institute of Medical Research, describe how a protein, [interleukin 37](#) (IL-37), reacts when an inflammatory response is detected in the body.

"Our bodies mount an inflammatory response to protect against an infection, such as bacteria or viruses. However, if uncontrolled, inflammation can become destructive. IL-37 is a [protein](#) from the cytokine family and is used by the immune system to regulate the immune response and protect the body from damage caused by excessive inflammation," said Dr Marcel Nold.

Dr Claudia Nold said that they discovered IL-37 is one of the rare anti-inflammatory cytokines that blocks inflammation throughout the whole body. And, unlike other anti-inflammatory cytokines, IL-37 does not target just one specific inflammatory agent but acts much more broadly.

"We also realised that IL-37 was activated by a wide range of biological triggers. There are very few cytokines in the human body that possess these qualities. We believe that potential therapies using IL-37 could treat a wide range of diseases in adults and children," she said.

The Nolds' next step is to apply their discovery in models of disease to further understand the protective properties of IL-37. One of their first projects will be to investigate the use of IL-37 to treat chronic lung disease in babies; a condition that is one of the major causes of mortality and long-term morbidity in babies born prematurely.

"Currently, the only way to treat this often fatal disease is to use powerful hormone-based therapies. While these can be effective, there is a range of serious side effects, including a return of the disease after cessation of treatment," said Dr Marcel Nold, who also holds a clinical appointment at Monash Newborn, Southern Health.

"We know this condition is an inflammatory disease, so we are hopeful that by manipulating IL-37, we may be able to treat infants before they develop any long term health and developmental problems," he said.

Using models and tissue samples, they will also investigate the role IL-37 plays in necrotizing enterocolitis, an often fatal disease in [premature babies](#), where parts of the gut die for reasons that are not clearly understood and for which no specific treatment exists. To pursue these goals, Drs Marcel and Claudia Nold will continue their collaboration with the laboratory of Professor Charles Dinarello at the University of Colorado, Denver, USA, and with Dr Philip Bufler, whose earlier work on IL-37 was essential for the success of the project.

"To discover that an obscure cytokine plays a key role in the immune response is a scientist's dream," the Nolds said. "We hope our work will serve as a foundation on which we can propel IL-37 to clinical application as fast as possible."

Provided by Monash University

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