

Scientists unearth cell 'checkpoint' that stops allergic diseases

9 August 2017

Scientists from Trinity College Dublin have made a significant breakthrough in understanding the regulation of immune cells that play a pivotal role in allergic diseases such as asthma and eczema. They have identified a 'checkpoint' manned by these immune cells that, if barred, can halt the development of the lung inflammation associated with allergies.

The discovery now provides a potential new target for drug developers to home in on. In theory, a drug that successfully regulates this newly pinpointed 'checkpoint' would better control overly aggressive allergic responses.

The team of scientists was led by Science Foundation Ireland Stokes Professor of Translational Immunology, Padraic Fallon, of the School of Medicine in the Trinity Biomedical Sciences Institute. The work has just been published in the leading peer-reviewed medical journal *The Journal of Experimental Medicine*.

Allergic conditions, such as asthma or eczema, arise when the immune system misfires and sparks an uncontrolled response to common allergens, such as house dust mites. In asthma this aberrant immune response leads to [immune cells](#) infiltrating the lungs, where they cause inflammation that affects lung function and leads to difficulties in breathing.

One key cell that is an early initiator of this [allergic inflammation](#) is known as a 'type 2 innate lymphoid cell' (ILC2). These [cells](#) instruct others, known as 'Th2 cells', to drive the cascade of inflammation in the lungs that leads to the development of asthma.

In this study, using a mouse transgenic approach, the scientists demonstrated that ILC2s express a checkpoint molecule, known as 'PD-L1', that functions to control the expansion of allergy-inducing Th2 cells and the development of allergic pulmonary and gut tissue inflammation.

Professor Fallon said: "This identification of an early stage cellular checkpoint that can act as a break on allergic responses has important implications for the development of new therapeutic approaches for asthma and other [allergic diseases](#)."

First author of the paper, Dr Christian Schwartz, a European Molecular Biology Organization Long Term Fellow in Professor Fallon's group, added: "It is fascinating that a small cell population such as the ILC2s can regulate the expansion of Th2 cells and thereby shape the whole outcome of an immune response - be it beneficial in case of parasitic infections, or detrimental as in the case of allergic responses."

"I believe the more we learn about these delicate cellular networks the more possibilities we will create for intervention."

More information: Christian Schwartz et al, ILC2s regulate adaptive Th2 cell functions via PD-L1 checkpoint control, *The Journal of Experimental Medicine* (2017). [DOI: 10.1084/jem.20170051](https://doi.org/10.1084/jem.20170051)

Provided by Trinity College Dublin

APA citation: Scientists unearth cell 'checkpoint' that stops allergic diseases (2017, August 9) retrieved 10 May 2021 from <https://medicalxpress.com/news/2017-08-scientists-unearth-cell-checkpoint-allergic.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.