Munching Macrophages! The Key to Asthma?

Cell birth and death are normal, daily events in all living organisms. In the airways, the turnover rate of cells is so high that the lining is entirely replaced every few days.

Most cell death is not the result of infection or damage, but is a natural, pre-programmed process in the development of each cell. An imbalance between the rate of production of new cells and the removal of old ones could pose serious problems, however, because if the dead cells are not removed, they can break apart and release their contents into the surrounding tissue. This leads to irritation and inflammation, making the airways susceptible to an asthma attack.

Luckily, help is at hand. As the cells die, a specialised scavenger cell, the lung macrophage, engulfs them, sealing away their tissue-destroying contents and removing them from the lungs, leaving the surrounding tissues undamaged. The activity of macrophages, therefore, plays a critical role in maintaining healthy tissues and minimising inflammatory conditions such as asthma.

Dr Christine van Dalen from the Centre for Public Health Research at Massey University has been awarded a Fast-Start Marsden grant, to study this process in more detail. The Fast-Start programme is an initiative to give promising, early-career researchers the opportunity to explore an innovative idea, helping them to develop their skills and establish their careers.

Dr van Dalen will determine if there are any differences, between asthmatics and non-asthmatics, in how well macrophages remove dead and dying cells from the lungs. If macrophages from asthmatics do indeed have defects in this capacity, this study will reveal a major clue to the development of asthma.

Future treatment for asthma could then be targeted towards improving the activity of lung macrophages, thereby either preventing the onset of asthma or leading to faster relief from its symptoms.

Total Funding: $140,000 over 2 years

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