



nature publishing group



► **COVER:** 'Bringing monocytes and macrophages into focus' by Simon Bradbrook, inspired by this month's Focus on Monocytes and macrophages.



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If you were to describe macrophages to a non-immunologist, you could be forgiven for using the analogy of the arcade game Pac-Man, in which Pac-Man is guided through a maze, gobbling up pac-dots. But macrophages are more than just the 'big-eaters' of the immune system, as exemplified by the six Review articles in this specially commissioned Focus issue on macrophages and their precursors, monocytes.

Macrophages first made headlines at the end of the 19th century, when Élie Metchnikoff described the ability of macrophages to engulf and destroy microorganisms, proposing this as a first line of defence against infection — a discovery that resulted in him being awarded the Nobel Prize in Medicine in 1908. Although met with scepticism at the time, the decades of research that followed have confirmed a central role for phagocytosis in host defence.

But phagocytosis is not the only function of these cells. Macrophages are probably the most versatile cells in the immune system and, in addition to clearing extraneous cellular material, they can present antigen to adaptive immune cells, respond to endogenous danger signals, produce both pro- and anti-inflammatory mediators, regulate glucose and lipid metabolism, establish tissue homeostasis and mediate wound healing.

Given their diverse functions, it is not surprising that dysregulation of macrophages is associated with a broad spectrum of diseases, ranging from allergy and asthma, metabolic diseases, cancer and autoimmunity to atherosclerosis, fibrosis and neurodegenerative diseases.

Thus, there is clear therapeutic value in understanding the homeostatic and pathogenic functions — as well as the development, recruitment and transcriptional regulation — of these chameleon-like cells that readily adapt to their environment. So, this month, our entire issue is dedicated to the intriguing immune cells that are macrophages. We hope that you enjoy it!

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