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► **COVER:** 'The faces of phagocytes' by Simon Bradbrook, inspired by the three articles in this issue on phagocytes (p415, p427 and p453).



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**W**hen Élie Metchnikoff shared the Nobel Prize in 1908 with Paul Ehrlich, it marked the recognition of synergism in the immune system between cellular (phagocytic) and humoral (antibody) components. However, not until 1989, when

Charles Janeway Jr postulated the hypothesis of pattern recognition receptors for pathogens, did phagocytes and innate immunity once again come to the fore.

Several articles this month celebrate the progress that has been made since in our understanding of phagocytes, as well as the remaining controversies. The heterogeneity of mononuclear phagocytes is discussed in a Viewpoint article on p453, in which Frédéric Geissmann, Siamon Gordon, David Hume, Allan Mowat and Gwendalyn Randolph give their views on the controversial relationship between dendritic cells (DCs) and macrophages.

In line with the theories of Metchnikoff that phagocytes maintain organismal integrity, Chen Varol, Ehud Zigmond and Steffen Jung (p415) describe the DC and macrophage subsets in the lamina propria that maintain intestinal homeostasis. Oliver Soehnlein and Lennart Lindbom (p427) add neutrophils to the discussion of phagocytic cell types and explain how neutrophils and macrophages cooperate to regulate inflammation. One consequence of phagocytosis is the cross-presentation of ingested antigens on MHC class I molecules to elicit CD8<sup>+</sup> T cell responses; Christian Kurts, Bruce Robinson and Percy Knolle (p403) discuss how this affects the immune response to infections and tumours and is involved in immune-mediated diseases.

Finally, Metchnikoff's homeostatic view of phagocytic cell lineages has come full circle with the discovery of myeloid-derived suppressor cells (MDSCs), which have immunosuppressive and tissue repair functions. Thanks to support from [BioLegend](#), a poster on MDSCs by Vincenzo Bronte and Dmitry Gabilovich is free to download at <http://www.nature.com/nri/posters/mdscs/index.html>.

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