Differential role of pannexin-1/ATP/P2X 7 axis in IL-1β release by human monocytes
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Differentiation of Gram positive and Gram negative activation of monocytes

What is it about?

White blood cells are one of the first lines of defence against bacteria. To facilitate this activity and to initiate eradication of the invading microorganisms, circulating white blood cells have proteins on their surface know as Toll-like receptors. These proteins detect microorganisms, which then initiates a chain reaction within the cell culminating in the production and excretion of substances that assist bacterial killing. One of these critical substances is interleukin-1 beta. There are two major classes of bacteria known: Gram-positive and Gram-negative. The major difference between these two isotypes is observed at the level of their outer membrane, with distinctive fat/protein complexes being present at the cell surface. Consequently, they are detected by different Toll-like receptors on the outer membrane of circulating white blood cell. As a general rule-of-thumb Gram-positive bacteria are detected by Toll-like receptor 2 and Gram-negative bacteria by Toll-like receptor 4. The aim of this study was to evaluate if a divergence exists in the production of anti-bacterial IL-1 beta between Gram-positive and Gram-negative bacteria. This we showed to be true, with different signalling pathways involved for IL-1 beta production elicited by Gram-positive or Gram-negative bacteria.

Why is it important?

This research highlights major differences by which the immune system has adapted to cope with Gram-positive and Gram-negative infection. These differences are important to note as they help us understand the diseases elicited by Gram-positive and Gram-negative bacteria. Furthermore, these incongruences will allow us to design treatments to specifically boost or dampen the immune response to these microorganisms, making treatments more selective and possibly more effective, also helping to reduce unwanted treatment side-effects.

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