ABSTRACTS

Understanding the role of scavenger receptor CD36 in modulation of dendritic cell responses

Dwipjyoti Sarma, Vinica Dhar, Arunika Mukhopadhaya

Indian Institute of Science Education and Research ,Mohali India

Introduction: Dendritic cells (DCs) are professional antigen-presenting cells (APCs) that play a central role in immunity. DCs, like other innate immune cells, usually rely on various germ-line encoded pattern recognition receptors (PRRs) to recognize some of the conserved patterns, called pathogen-associated molecular patterns (PAMPs), on microbes. Recent studies from various groups highlight the emergence of scavenger receptors (SRs) as non-classical PRRs.

Aim and objectives: Scavenger receptors have been extensively studied for their role in sterile inflammatory disorders like atherosclerosis. However, their precise role in infection scenario is still less explored. The major focus of the current study is to understand how dendritic cell engages SR CD36 to modulate immune responses against certain bacterial ligands.

Methodology: Different techniques such as ELISA, western blotting, flow cytometry and confocal microscopy have been used in the study of bone marrow-derived DCs (BMDCs).

Results: The team has previously reported the involvement of CD36, a class-B scavenger receptor in recognition of OmpU, one of the major outer membrane protein of Vibrio cholera in macrophages and its role in induction of pro-inflammatory responses via NOX2-mediated ROS generation and MAPK activation. Current study reveals that the same ligand OmpU, can also modulate DC responses, via TLR2-MyD88-MAP kinase pathway for production of pro-inflammatory cytokines. Towards exploring the role of CD36 in the modulation of DC responses, the team has observed that OmpU-mediates ROS generation in DCs in NOX2-dependent manner and ROS contributes to OmpU-induced pro-inflammatory cytokine (IL-1β and IL-6) responses in DCs. However, in contrast to macrophages, in DCs CD36 alone cannot generate ROS, it needs co-operation from TLR2. Further investigation suggests that JNK, ERK, PI3K, PKC, NFκB and AP1 are involved in ROS generation. However, p38, Src-kinase and IκB kinase (IKK) negatively regulate OmpU-mediated ROS generation in DCs. Furthermore, the team is trying to dissect out the pathways downstream to TLR2 and CD36 regulating the complex signaling cascade.

Discussion and conclusion: The team is trying to discern the role of TLR2 and CD36 both in OmpU-mediated ROS generation in DCs. It would be interesting to understand whether this receptor shows some co-operative behavior for the induction of ROS and how the complex signaling pathways are orchestrated for the regulation of the ROS production in DCs. Further, to better understand the role of CD36 in the functioning of DCs, the team is also exploring the role of OmpU from another human pathogen Vibrio vulnificus (VvOmpU) in modulation of dendritic cell responses in presence or absence of CD36.

Presented by: Dwipjyoti Sarma
SIRCON 2023 held at IISC, Bengaluru
DOI: 10.15305/ijir.v7i1.389