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Necator americanus L3 interactions with human dendritic cells

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Despite the profound health implications of *Necator americanus* (*N. americanus*) infection in human, many aspects of its interaction with the host immune system are poorly understood. In this context, we studied the direct effects of *N. americanus* larvae (L3) on the phenotype and function of human dendritic cells (DCs). For the first time, our data show that L3 *N. americanus* larvae exsheathed in the presence of DCs while DCs formed aggregates around the discarded sheath but had negligible interaction with the emerging larvae, alluding to a disparity between the surface chemistry of the larval sheath and its cuticle. Our data also suggest that the interaction between DCs and larvae is likely to be mediated via C-type lectin receptors (CLRs) as evidenced by an inhibition in the formation of DC aggregates around the larvae cuticle after blocking DC-SIGN (dendritic cell- specific intercellular adhesion molecule-3 grabbing non-integrin) and MR (mannose receptor). Additionally, DCs incubated with viable axenic larvae exhibited an immature phenotype as evidenced by the low expression of the maturation markers CD80, CD83, CD86, CD40, and HLA-DR. However, DCs maintained their ability to acquire a mature phenotype in response to LPS. Cytokine expression by DCs stimulated with the larvae was comparable to untreated DC, with a statistical significance in contrast to LPS treated DCs ($p \leq 0.029$ IL-6, 8 and 10). DC co-stimulated with LPS and *N. americanus* exhibited an overall suppression of anti- and pro-inflammatory cytokines (IL-6, IL-8, IL-10 and IL-12) compared to DCs stimulated with LPS only (p value ≤ 0.3). The results were not compromised due to DCs viability. These data provide new insights into early immunological events at the interface of DCs and *N. americanus* larvae and could explain how L3 evade immunity upon initial interaction with antigen presenting cells.

Biography

Asha Hassan has completed her Doctorate in Immunology at the University of Nottingham. She is an individual with an extreme passion for humanitarian aid, particularly within the promotion of human welfare to eliminate vaccine preventable infectious diseases, in countries with poor public health provisions. Her Ph.D. research is on the immunology of Neglected Tropical Diseases (NTD's), particularly Necator americanus, with a focus on the rational design of an innovative and more efficient intervention strategy against vaccine preventable NTD's.

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