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A novel ligand of toll-like receptor 4 from *Wuchereria bancrofti* induces classical macrophage activation

Lymphatic filariasis (LF), a vector-borne parasitic disease, is endemic in several parts of the globe and causes morbidities, disabilities and socio-economic loss to a large population every year. Inflammatory events resulted from host-parasite interactions play key role in the pathology of LF. The study was undertaken with an objective to isolate the proinflammatory factor from microfilaria of *Wuchereria bancrofti*. A ~70 kDa microfilarial protein (MfP) was isolated from the lysate of *W. bancrofti* microfilariae through ultrafiltration followed by p-amino phenyl phosphoryl choline affinity chromatography. Inflammation of MΦ was studied by determining the expression of TLR4, its downstream signaling molecules and proinflammatory cytokines using immunoblotting and PCR. In this investigation, we have found that MfP of *W. bancrofti* binds to macrophage (MΦ)-TLR4 receptor. This protein triggers TLR4 signaling pathway through NF-κB activation. It was also evident from elevated secretion of proinflammatory cytokines i.e., TNF-α, IL-6 and IL-1β. To examine the specificity of MfP for augmenting TLR4 mediated proinflammatory signals, TLR4 KO MΦ were incubated with MfP, failure of MfP to evoke proinflammatory responses through NF-κB activation suggested MfP induced mediation of TLR4 activity. Additionally, fluorescent labeled MfP demonstrated its binding to TLR4. MfP therefore appears to be a new ligand on the surface of *W. bancrofti*, determination of its functional attributions in host-parasite relationship may open an unknown area in our understanding.

Biography

Santi P Sinha Babu is an eminent Researcher in the field of Lymphatic filariasis. Presently he is working as a Professor at the Department of Zoology, Visva-Bharati University, Santiniketan, India. His area of specialization is the development of antifilarial drugs from natural sources and evaluation of their mode of action at molecular level. He has teaching experience of more than 24 years and research experience of more than 34 years. He has undertaken research projects from almost all funding agencies of India like CSIR, DBT, DST, UGC and Ministry of Health, Government of India. He has published more than 90 papers in reputed international journals and presented papers in several international conferences abroad. His current activity includes understanding of filarial immunobiology, development of nanoparticle-drug conjugate and targeted immunostimulation of TLR4 with plant products.

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