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Peptide based treatment for neutralising LPS in septicemia and controlling the release of proinflammatory cytokines

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Sepsis is an inherent fatal clinical syndrome and no effective therapy is actually known. In case of gram negative bacteria, Lipopolysaccharides cause infection which is mediated by proinflammatory cytokines (TNF and IL-1) and late (HMGB1). During the early stages of sepsis; the complement system is systemically activated, generating large amounts of the anaphylatoxin, C5a, which is a central molecule in the immunopathogenesis of sepsis, exerts its effects through interactions with its two C5a receptor (C5AR) and C5a-like receptor 2 (C5L2). The expression of these receptors is upregulated during sepsis, and their interactions with C5a contribute synergistically to harmful events in sepsis. We hypothesize that it's more beneficial to block the infectious agent in the first step enabling better control on the immune system activation. Lipopolysaccharide (LPS) is the bioactive molecule present on the outer membrane of the Gram-negative bacteria. LPS interacts with sensors on the host cell membrane to activate the immune response. Thus, developing bio-molecules (peptides) which are capable of interfering with LPS at high affinity, especially to the lipid A moiety is an efficient way to neutralize the LPS toxicity. Alternatively, by blocking LPS and its serum binding protein one can block LPS toxicity. We designed based on bioinformatics data two peptides and demonstrated *in vivo* that both these peptides effectively blocked LPS mediated activation of cytokine production in cells. These peptides can be an effective treatment to neutralize the LPS so that sepsis can be controlled.

Biography

I am Madhuri Padala presently pursuing my PhD in Biochemistry under the supervision of Dr Sritharan, Head, Molecular Diagnostics and markers, Global hospitals, Hyderabad, in the area of sepsis, inflammation and proinflammatory cytokines in collaboration with Prof. Surya S. Singh, Dept. of Biochemistry, Osmania University, Hyderabad. I have completed my masters in biochemistry from Nagarjuna University, Guntur, Andhra Pradesh and M.Phil in Biotechnology from Bharathidasan University, Trichy, Tamilnadu. My area of interests are immunology and molecular biology. I am a recipient of all round proficiency award in BSc. My interests are reading and travelling.

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