Exploring new immunological insight on SP15 (~14 kDa) family protein in saliva of Indian sand-fly (*Phlebotomus argentipes*) in experimental visceral leishmaniasis

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Abstract

Visceral leishmaniasis (VL) is a disease caused by protozoan species of the genus *Leishmania* and is transmitted through bites from the *Phlebotomus* sand fly; it is associated with considerable morbidity and mortality in many parts of world, including India. Reports on the protective role played by saliva proteins of *Lutozomyia longipalpis*, *Phlebotomus papatasi* and *Phlebotomus duboscqi* are available. However, no studies have explored the salivary proteins of *P. argentipes*, which is the known proven vector for the transmission of VL in the Indian sub-continent. Herein we revealed the presence of two proteins of 14.2 and one protein of 13.6 kDa in Indian strain *P. argentipes* which is absolute identical to previously reported protein of SP15 family (PagSP01, PagSP02 and PagSP07) of *P. argentipes* of NIH colony, USA. In an experimental study on *P. argentipes* from Bihar, India, we demonstrated that a strong humoral and cellular immune response was triggered to reduce the concomitant *Leishmania* load in groups of immunized mice. The immunized group produced a considerable amount of IgG antibodies, and their splenocytes generated TH1 cytokines (IL-12, IFN-γ) with the support of delayed-type hypersensitivity (DTH) reactivity in such mice at the challenged site. We summarize from our data that some identical proteins to previous from SP15 family protein of 14.2 and 13.6 kDa molecular size, derived from Indian *P. argentipes* and reported its first time, can also be significant in resolution of VL infection after modulation of host protective T cell response in VL.

Biography: More than 25years research experience in the field of leishmaniasis to reveal the resistant isolates demography, their role in protective cytokine diversion, control of parasitic anemia in visceral leishmaniasis as well as identification of phytopharmaceutical anti-leishmanial candidate and also to identify the candidate for vector based vaccine development against leishmaniasis.

Publication: 46: On different aspects of leishmaniasis with the help of parasites, herbs, shrubs and vector saliva using Microbiological, Immunological, Molecular and Biochemical tools. The research papers are published in well reputed journals.

Recent publications as corresponding/ first author

1. Exploring new immunological insight on SP15 (~ 14kDa) family protein in saliva of Indian sand-fly (*Phlebotomus argentipes*) in experimental visceral leishmaniasis. (2018), Cellular immunology. 332, pp.51-57.

2. *Cedrus deodara: In vitro* anti-leishmanial efficacy & immumomodulatory activity. (2017), The Indian journal of medical research, 146(6), p.780.

3. Direct evidence for role of anti-saliva antibodies against salivary gland homogenate of P. argentipes in modulation of protective Th1-immune response against *Leishmania donovani*. (2016).Cytokine, 86, 79-86.

4. Degree of anemia correlates with increased utilization of heme by *Leishmania donovani* parasites in visceral leishmaniasis. (2013). Experimental parasitology. 135, 595-598.

5. *Leishmania donovani* vs. Immunity: T-cells sensitized from *Leishmania* of one donor may modulate their cytokines pattern on re-stimulation with *Leishmania* from different donor in visceral leishmaniasis: (2009). Experimental Parasitology 121, 69-75