*Ranjan et al. (2017) Can J Biotech, Volume 1, Special Issue (Supplement), Page 262*
https://doi.org/10.24870/cjb.2017-a246

Canadian Journal of Biotechnology

ISSN 2560-8304

Poster Presentation OPEN ACCESS

**Category: Functional Genomics**

# Computational screening of Six Antigens for potential MHC class II restricted epitopes and evaluating its CD4+ T-Cell Responsiveness against Visceral Leishmaniasis

**Manas Ranjan, Dikhit, Akhilesh Kumar, Ganesh Chandra Sahoo, Sanjiva Bimal and Pradeep Das***

Rajendra Memorial Research institute of Medical Sciences, Agamkuan 800007, INDIA

Presenting author: manasranjandikhit@gmail.com

## Abstract

Visceral leishmaniasis is one of the most neglected tropical diseases for which no vaccine exists. In spite of extensive efforts, no successful vaccine is available against this dreadful infectious disease. To support the vaccine development, immunoinformatics approach was applied to search for potential MHC-classII restricted epitopes that can activate the immune cells. Initially, a total of 37 epitopes derived from six, stage dependent over expressed antigens were predicted, which were presented by at least 26 diverse MHC class II alleles including: DRB10101, DRB10301, DRB10401, DRB10404, DRB10405, DRB10701, DRB10802, DRB10901, DRB11101, DRB11302, DRB11501, DRB30101, DRB40101, DRB50101, DPA10103-DPB10401, DPA10103-DPB10201, DPA10201-DPB10101, DPA10103-DPB10301_DPB10401, DPA10301-DPB10402, DPA10201-DPB105021, DQA10102-DQB10602, DQA10401-DQB10402, DQA10501-QB10201, DQA10501-DQB10301, DQA10301-DQB10302 and DQA10101-DQB10501. Based on the population coverage analysis and HLA cross presentation ability, six epitopes namely, FDLFLFSNGAVVWWG (P1), YPVYPFLASNAALLN (P2), VYPFLASNAALLNLI (P3), LALLIMLYALIATQF (P4), LIMLYALIATQFSDD (P5), IMLYALIATQFSDDA (P6) were selected for further analysis. Stimulation with synthetic peptide alone or as a cocktail triggered the intracellular IFN-γ production. Moreover, specific IgG class of antibodies was detected in the serum of active VL cases against P1, P4, P and P6 in order to evaluate peptide effect on humoral immune response. Additionally, most of the peptides, except P2, were found to be non-inducer of CD4+ IL-10 against both active VL as well as treated VL subjects. Peptide immunogenicity was validated in BALB/c mice immunized with cocktail of synthetic peptide emulsified in complete Freund's adjuvant/incomplete Freund's adjuvant. The immunized splenocytes induced strong spleen cell proliferation upon parasite re-stimulation. Furthermore, an increased IFN-γ, IL-12, IL-17 and IL-22 production augmented with elevated NO synthesis is thought to be play a crucial role in macrophage activation. Moreover, a significantly reduced parasite load in immunized group indicates the potentiality of polytope driven vaccine candidate against Visceral leishmaniasis.

**Citation:** Ranjan, M., Dikhit., Kumar, A., Sahoo, G.C., Bimal, S. and Das, P. Computational screening of Six Antigens for potential MHC class II restricted epitopes and evaluating its CD4+ T-Cell Responsiveness against Visceral Leishmaniasis [Abstract]. In: Abstracts of the NGBT conference; Oct 02-04, 2017; Bhubaneswar, Odisha, India: Can J biotech, Volume 1, Special Issue (Supplement), Page 262.
https://doi.org/10.24870/cjb.2017-a246