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Immunology

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We are trying to investigate the molecular basis of susceptibility and resistance in murine models of tuberculosis. It is well known that helper T (Th) cell subsets play a central role in the outcome of TB pathogenesis. While Th1 and Th17 cells confer resistance, Th2 and T regulatory cells enhance disease progression. However, the precise activity of these subsets of Th cells during the progression of infection has not been well studied. We are investigating the activity of different Th subsets in reporter knock-in and knock-out animals and their co-relation with disease progression.

CURRENT RESEARCH

Topic

Dissecting the roles of T-regulatory (Treg) cells in *Mycobacterium tuberculosis* infection in the murine model

Methodology

- T cell isolation, Differentiation of T cells, Proliferation of T cells, FACS sorting of specific T cells, Cytokine profiling by Luminex Technologies

Application

It will be interesting to identify the components that are responsible for the induction of Th2 cells and T-reg, which will enable us to design improved vaccines and therapies for tuberculosis.

Past Researches

- Swagata Ghosh, Hanumantha Rao Kongara, Neel Sarovar Bhavesh, Gobardhan Das, **Ved Prakash Dwivedi** and Asis Datta. N-acetylglucosamine (GlcNAc) inducible gene, GIG2, is a novel component of GlcNAc metabolism in *Candida albicans*. *Eukaryot Cell*. 2013 Nov 1.
- Ved Prakash Dwivedi**, Debapriya Bhattacharya, Samit Chatterjee, Luc Van Kaer, Debprasad Chattopadhyay, William R. Bishai, and Gobardhan Das. *Mycobacterium tuberculosis* directs T helper 2 cell differentiations by inducing interleukin-1beta production in dendritic cells. *J Biol Chem*. 2012 Sep 28;287(40):33656-63.
- Ved Prakash Dwivedi**, Ramesh Chandra Rai, Samit Chatterjee, Durbaka Vijaya Raghava Prasad and Gobardhan Das. Early secretory antigenic target-6 of *Mycobacterium tuberculosis*: enigmatic factor in pathogen-host interactions. *Microbes Infect*. 2012 Nov;14(13):1220-6.
- Yogesh Singh, Samit Chatterjee, Vandana Kaul, Sultan Tousif, **Ved Prakash Dwivedi**, Alka Mehra, Luc Van Kaer, Gobardhan Das. *Mycobacterium tuberculosis* controls microRNA-99b (miR-99b) expression in infected murine dendritic cells to modulate host immunity. *J Biol Chem*. 2013. Feb 15;288(7):5056-61.
- Ved Prakash Dwivedi**, Mohd Moin Khan, Samit Chatterjee, Nishant Kumar Pandey, Yogesh Singh, Sultan Tousif, Neel Sarovar Bhavesh, Luc Van Kaer, Jyoti Das, and Gobardhan Das. CD4+T Cell-derived Novel Peptide Thp5 Induces Interleukin-4 Production in CD4+T Cells to Direct T Helper 2 Cell Differentiation. *J Biol Chem* 2012 Jan 20: 287(4) 2830–2835.
- Ved Prakash Dwivedi**, Sultan Tousif, Debapriya Bhattacharya, Durbaka Vijaya Raghava Prasad, Luc Van Kaer, Jyoti Das, and Gobardhan Das. Transforming growth factor- β protein inversely regulates in vivo differentiation of interleukin-17 (IL-17)-producing CD4+ and CD8+ T cells. *J Biol Chem*. 2012 Jan 27;287(5):2943-7.
- Ved Prakash Dwivedi**, Samit Chatterjee, Yogesh Singh, Imran Siddiqui, Pawan Sharma, Luc Van Kaer, Debprasad Chattopadhyay and Gobardhan Das. Early secreted antigen ESAT-6 of *Mycobacterium tuberculosis* promotes protective T helper 17 cell responses in a toll-like receptor-2-dependent manner. *Plos Pathogen*. 2011 Nov; 7(11):e1002378.
- Tarun Kumar Bhatt, Sameena Khan, **Ved Prakash Dwivedi**, Mudassar Meraj Bandey and Amit Sharma. Malaria parasite tyrosyl-tRNA synthetase secretion triggers pro-inflammatory responses. *Nature Communications*. 2011 Nov 8;2:530. doi: 10.1038/ncomms 1522.

Future Interests

Immunology of tuberculosis, Vaccine design.

Extra Interests

Reading scientific journals, listening music.