

32<sup>nd</sup> International Conference on  
**VACCINES AND IMMUNIZATION &**  
4<sup>th</sup> Annual Summit on  
**INFANCY, CHILD NUTRITION & DEVELOPMENT**

November 09-10, 2018 | Atlanta, USA



## Rajatava Basu

University of Alabama at Birmingham, USA

### All disease begins in the gut: A story of the warrior T helper cells and the invading microbes of the gut

A human body can harbor 5-10 times more microbes than the total number of cells and 90% of all these microbes enter our body through the intestine. Intestine contains the largest compartment of our entire immune system. CD4 T helper cells, arguably the most important cells in our immune system are required to protect the intestine against the daily invasion of millions of microbes. Besides combating pathogens, CD4 T helper cells also play a critical role in various inflammation, autoimmune disorders, and allergic diseases. While, a class of CD4 T helper cell, known as regulatory T cells (iTreg), encourages infection while suppressing autoimmune responses; another class of T helper cell, known as T helper 17 (Th17), fights infection while promoting autoimmune response. Interestingly, the intestinal immune system doesn't react to commensal microbes due to the production of a vitamin A metabolite retinoic acid. This vitamin A metabolite helps to maintain homeostasis in the gut as it promotes differentiation of iTreg cells, which in turn promote tolerance so that the intestinal immune cells don't react to commensal bacteria unnecessarily. During the invasion of pathogenic microbes, the homeostasis is broken and other classes of CD4 T cells differentiate to take over the role of the warrior and thwart the pathogens from invading our body. One of the most important classes of effector cells that protect against bacterial invasion are the Th17 cells, whose differentiation is opposed by vitamin A present abundantly in the gut. Interesting both iTreg and Th17 cellular differentiations require a common signaling pathway that intrinsically links their developmental axis. The talk will briefly focus on the roles of differentiation of these 2 types of T helper subsets on protection against an enteropathogenic bacteria *Citrobacter rodentium*, a murine gut bacteria that closely mimics enterohemorrhagic *Escherichia coli* infection of humans and serves as a useful model for studying intestinal immune response, and briefly discuss the mechanism of their orchestration to confer protective immunity to the enteropathogenic bacteria. This talk will also highlight the emerging role of the intestinal immune system in human health and focus on the dynamics of an intestinal immune system capable of thwarting the microbial onslaught from trillions of microbes.

### Biography

Rajatava Basu received his doctoral training from India and Germany working at Indian Institute of Chemical Biology, India and Charite Medical School, Humboldt University, Germany where he characterized immunodominant epitopes by proteomic analysis to develop an effective DNA vaccination strategy against infectious diseases. After completing a stint at Charite-University Medicine Berlin as a visiting scientist, he came to the US and joined the laboratory of Prof Casey Weaver at UAB for pursuing his postdoctoral training on the area of cellular and molecular mechanisms controlling T cell-mediated immune regulation during autoimmune inflammation. Currently, he is an Assistant Professor of pathology at UAB School of Medicine and a Crohn's and Colitis Foundation (CCFA, USA) fellow. He has published in leading journals like Nature Immunology, Immunity and Immunological Reviews. He has received prestigious international scholarships and has been awarded Alexander von Humboldt fellowship and Volkswagen Stiftung fellowship.

rajatavabasu@uabmc.edu

### Notes: