Prof.Dr.Rafi Ahmed, PhD

Director, Emory Vaccine Center

Professor, Department of Microbiology and Immunology
Eminent Scholar, Georgia Research Alliance
Phone: 404-727-4700,
Fax: 404-727-3722

Email: rahmed@emory.edu

Dr. Rafi Ahmed, a member of the National Academy of Science, is a world-renowned immunologist whose work during the past decade has been highly influential in shaping our current understanding of memory T cell differentiation and anti-viral T and B cell immunity. The long-term goal of Dr. Ahmed's research is to understand the mechanisms of B and T cell immunological memory and to use this information to develop new vaccines for the prevention and treatment of disease. The Ahmed laboratory uses highly sophisticated cellular and molecular techniques to study antigen-specific immunological memory in murine, primate, and human systems. A major area of focus is identifying cellular molecules that regulate the generation and maintenance of CD8 and CD4 T cell and humoral immunity. One such molecule is mTOR that we recently identified as a major regulator of memory CD8 T cell differentiation.

Another area of focus is to develop strategies to restore function in virus-specific T cells during a chronic viral infection such as HIV or Varicella-zoster virus (VZV). A key breakthrough by the Ahmed laboratory several years ago demonstrated the striking differences in memory CD8 T cell differentiation during acute versus chronic viral infection resulting in the identification of the inhibitory receptor, PD-1, as a major mediator of T cell dysfunction during chronic infection. This work has directly translated into human clinical studies where PD-1 antibody blockade has since been used to treat both chronic infection and cancer. We are currently working on additional inhibitory receptors we have identified and also the roles of CD4 follicular helper T cells, memory B cells, and antibody play during chronic viral infection.

Another approach of the Ahmed laboratory is to understanding humoral memory development and maintenance. We have co-developed a novel method for rapidly generating human monoclonal antibodies after vaccination and have shown that broadly cross-reactive antibodies that recognize multiple influenza viruses can be generated after influenza vaccination in humans. These studies and those currently on going which include understanding the mechanisms that regulate the development of neutralizing antibody give rise to the possibility that a universal influenza vaccine could be developed in the near future.