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### CD8<sup>+</sup> Treg in health and primary immunodeficiency diseases

In past few years, seminal experiments in mice models of human diseases provided strong evidence of the presence of natural CD8<sup>+</sup> T regulatory cells (CD8 Treg). The role of CD8<sup>+</sup> Treg was subsequently shown in the control of several autoimmune disease models. Shi and associates have reported that human CD8<sup>+</sup>CXCR3<sup>+</sup> (CD183<sup>+</sup>) T cells have same function as murine CD8<sup>+</sup>CD122<sup>+</sup> Treg. We have investigated a role of CD8<sup>+</sup> T cells in regulating various functions of autologous and allogeneic CD4<sup>+</sup> T cells. CD8 T reg inhibit cell division and DNA synthesis of autologous CD4<sup>+</sup> T cells, and differentiation of naïve CD4<sup>+</sup> to effector memory CD4<sup>+</sup> (T<sub>EM</sub>) and CD45RA<sup>+</sup> terminally differentiated effector memory/exhausted CD4<sup>+</sup> T cells (T<sub>EMRA</sub>). CD8<sup>+</sup> Treg mediates their regulatory effect, at least in part, by IL-10 and MIP1 $\beta$ , and not due to direct cytotoxicity/apoptosis of CD4<sup>+</sup> T cells. CD8<sup>+</sup> T cells inhibit secretion IL-17A, IL-10, and IFN- $\gamma$  by autologous CD4<sup>+</sup> T cells. Furthermore, CD8 Treg inhibits induction of FoxP3 in CD4<sup>+</sup> T cells. Therefore, CD8<sup>+</sup> Treg are regulators of regulatory CD4<sup>+</sup> T cells. CD8<sup>+</sup>Treg were further characterized phenotypically, and appear to be CD8<sup>+</sup>CCR7<sup>+</sup>CD25<sup>hi</sup>ICOS<sup>+</sup>CTLA-4<sup>+</sup>FoxP3<sup>+</sup> phenotype. CD8<sup>+</sup> Treg in primary immunodeficiency diseases and human aging will be discussed.

### Biography

Sudhir Gupta is a Professor of Medicine, Pathology & Laboratory Medicine, and Microbiology & Molecular Genetics, Chief of the Division of Basic and Clinical Immunology, and the Director of the Jeffrey Modell Diagnostic Center in Primary Immunodeficiencies at the University of California, Irvine. He also serves as Director of Scientific Development at the Sass Foundation for Medical Research in New York. Dr. Gupta received his medical and doctorate degrees from the King George's Medical College in Lucknow, India. Previous appointments include Associate Professor of Medicine and Immunology at the Weill Cornell Medical College, and Associate Member at the Sloan-Kettering Institute for Cancer Research, both in New York, New York. He is board certified in Clinical Immunology by the Royal College of Physicians and Surgeons of Canada; he is board certified in Allergy and Immunology, and Diagnostic Laboratory Immunology by the American Board of Allergy and Immunology. Dr. Gupta is a Master of the American College of Physicians. He has served on a number of committees for many leading governmental bodies and organizations, including the National Institutes of Health, the U.S. Food and Drug Administration, and the World Health Organization. He has made many original contributions in the field of cellular and molecular immunology as it relates to primary immunodeficiency diseases, AIDS, cancer research, and aging. These findings have been published in high-impact journals, including Science, Nature, the Proceedings of the National Academy of Sciences, the Journal of Experimental Medicine, the Journal of Clinical Investigation, the New England Journal of Medicine, and Aging Cell. Dr. Gupta has published more than 500 scientific papers, invited reviews, and book chapters. He has edited 24 books in various areas of cellular, molecular, and applied immunology, including one on primary immunodeficiency.

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