

PD-1 and CTLA-4 mediated inhibitory signaling for T cell exhaustion during chronic viral infections

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Emerging studies show that T cell exhaustion correlates well with increased expression levels of inhibitory receptors including Programmed cell death receptor 1 (PD-1) and Cytotoxic T-Lymphocyte Antigen 4 (CTLA-4) during chronic infections. Both inhibitory molecules play similar but non-redundant role in T cell exhaustion. Engagement of PD-1 and CTLA-4 by their ligands inhibits T cell proliferation, cytokine secretion, and attenuates immune responses. Blockade of PD-1 and CTLA-4 restores effector function of exhausted T cells. PD-1 and CTLA-4 could both recruit Src homology 2-containing tyrosine phosphatase 2 (SHP2) and inhibit activation of Akt. Nevertheless, PD-1 and CTLA-4 also target distinct signaling molecules to inhibit T cell function. In this review, we will discuss current understanding of PD-1 and CTLA-4 initiated signaling pathways, their regulatory roles in a variety of chronic viral infections, and their promising potential as targets to enhance T cell function for antiviral therapy.

Biography

Bin Wei has worked as an associate professor in Institute of Biochemistry and Cell Biology (SIBCB), Shanghai Institutes for Biological Sciences (SIBS), Chinese Academy of Sciences (CAS). His research in SIBCB focused on the investigations of immunomodulatory molecules with the potential of anti-inflammatory therapeutics. Before going to SIBCB, he also experienced postdoctoral training in the UK where he was keen on the signaling transduction upon T cell activation and immune tolerance induction, was also involved in metagenomics analysis of new emerging pathogens in equine. Dr. Wei studied in biology and did his MSc study in histology and embryology in Lanzhou medical school, Lanzhou University, then achieved his Ph.D. degree in virology and vaccine development at Chinese National Academy of Preventive Medicine in Beijing.

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