Immune Regulation by Regulatory Cells

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Immune regulation is a complex process that involves the cooperation of the network of regulatory cells. Different regulatory cells such as regulatory T cells, tolerogenic dendritic cells, regulatory macrophages (alternatively activated, M2 macrophages), regulatory B cells, myeloid-derived suppressor cells, and mesenchymal stem cells, have been shown to play important roles in the regulation of immune responses and control of the pathophysiology of inflammatory responses in autoimmunity and graft rejection.

Regulatory cell therapy is a potentially useful therapeutic approach in various immune-mediated inflammatory diseases such as autoimmune diseases, transplant rejection, or graft-versus-host disease in early clinical trials. Preclinical studies have shown the efficacy and safety of using various suppressor cells. Although a significant number of steps have already been taken toward clinical application, several challenges such as cell transplantation route, optimum dose and time, isolation and expansion technique, and combination therapy still need to be overcome in cell therapy of acute and chronic inflammatory disorders. More research is needed to overcome the challenges of using regulatory cell treatment in acute and chronic inflammatory disorders.
Immune Regulation by a Network of Regulatory Cells

- Regulatory T cells (Treg)
- Regulatory B cells (Breg)
- Regulatory macrophages (M2)
- Regulatory (tolerogenic) Dendritic cells (DCreg)
- Regulatory innate lymphoid cells (ILCreg)
- Follicular regulatory T cells (Tfr)
- Regulartory Natural killer (NKreg)
- Myeloid-derived Suppressor Cells (MDSC)
- Mesenchymal stem cells (MSCs)