Researchers are currently exploring the potential use of Interleukin (IL-)-27 as an immunotherapeutic agent. An example of this, is the experimental administration of IL-27 to improve experimental autoimmune encephalomyelitis (EAE, murine model of multiple sclerosis) outcomes. IL-27 is a member of the IL-12 cytokine family, and was initially shown to have pro-inflammatory effects, that included preferential induction of IFN-γ. However, recent studies have shown that IL-27 also exhibits anti-inflammatory effects against Th17 immunity. The potential “protective effect” of IL-27 in the EAE model has been linked to dampening of Th17 immunity and induction of IL-10 production.

A study by Kim et al., investigated how IL-27 administration (via a slow releasing pump) mechanistically alleviated EAE severity. They showed that “therapeutic effect” of IL-27 during EAE only occurs in the presence of Tregs. This activity required direct signalling of IL-27 via its (IL-27) receptor on inducible (iT)regs, and resulted in reduced inflammatory cytokines and T cell infiltration of
the central nervous system (CNS).

IL-27 has also been shown to promote IL-10 secretion in non-Treg CD4 T cells, secretion that is capable of dampening inflammation and could be the mechanism of IL-27 mediated reduction of EAE severity. In vitro IL-27 has been shown to induce IL-10 secretion by Th1, Th17 and iTreg cells, however in vivo IL-27 only induces IL-10 production in Tregs (and Th1 and Th17 cells). In addition to induction of IL-10, Kim et al., showed that IL-27 in vivo induces expression Lag3 (negative regulator of activated T cells) in Tregs, which is required for Treg mediated protection.

In summary, findings by Kim et al., highlight the potential use of IL-27 as an immunotherapy during EAE. Where in vivo administration of IL-27 induces IL-10 production and Lag3 expression by Tregs, resulting in reduced inflammatory cytokine secretion, inflammation and pathology during EAE.


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