

Dual Role of Interleukin-37 As an Anti-Inflammatory and A Regulatory Cytokine In EAE



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Abbreviations: SLE: Systemic Lupus Erythematosus; RA: Rheumatoid Arthritis; IBD: Inflammatory Bowel Disease; MS: Multiple Sclerosis; EAE: Experimental Allergic Encephalomyelitis; GM-CSF: Granulocyte Macrophage Colony Stimulating Factor

Opinion

Interleukin 37 (IL-37) was known as IL-1F7 before Nold and his colleagues renamed it. Nold believed that IL-37 which expressed on cells including macrophages or epithelial cells plays an anti-inflammatory effect under the condition of intracellular and extracellular. IL-37 almost completely suppresses the production of pro-inflammatory cytokines, whereas the abundance of these cytokines increased with silencing of endogenous IL-37 in human cells [1]. Most studies have now focused on the function of IL-37 as an anti-inflammatory cytokine, while other related functions are still being explored. An autoimmune disease is a condition in which the immune system attacks the body [2,3]. Recent research confirmed that IL-37 is associated with many autoimmune diseases such as systemic lupus erythematosus (SLE), rheumatoid arthritis (RA), inflammatory bowel disease (IBD), and multiple sclerosis (MS) [4-7]. These studies have shown that IL-37 could inhibit pro-inflammatory cytokines such as TNF- α , IL-1 α , IL-1 β , IL-6, G-CSF and GM-CSF [1-3].

In order to verify that IL-37 could inhibit these inflammatory factors in experimental allergic encephalomyelitis model (EAE), which is commonly used as an animal model for studying multiple sclerosis, we constructed an EAE model using IL-37 transgenic mice. We hypothesized that IL-37 could alleviate the pathological symptom by reducing inflammatory factors. We found that IL-37 can increase the expression of anti-inflammatory cytokines such as IL-10 and reduce that of pro-inflammatory factors including GM-CSF, IL-6, TNF- α . However, the clinical symptoms of IL-37 transgenic mice in EAE were more serious. This experiment has been repeated for many times. Nowadays more and more evidences have shown

some cytokines play a dual role in pro- and anti-inflammatory activities. For example, granulocyte macrophage colony stimulating factor (GM-CSF) was now considered to be a pro- and anti-inflammatory activities with the functional outcome dependent on the dose and the presence of other relevant cytokines in the context of an immune response [8].

Conclusion

We supposed that IL-37 may be able to achieve its anti-inflammatory and a regulatory cytokine role by reducing some special dual role pro-inflammatory cytokines. More precise results need to be proved in more experiments.

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