



Special Issue “**Autoinflammation vs Autoimmunity**”

Brief Review

Overview on autoimmunity and autoinflammation

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Paul Ehrlich proposed “horror autotoxicus” as immune reactivity against self, which is now called autoimmunity, about a century ago. Burnet and others demonstrated the presence of autoantibodies and provided a theoretical basis for autoreactivity in 1957¹⁾. Conceptually, autoimmunity is viewed as an immune system defect of either B or T lymphocytes that are involved in adoptive immune activation. In another word, autoimmunity is an adaptive immune responses directed at self antigens and can lead to autoimmune diseases that are characterized by tissue damages, although autoimmunity is present in everyone to some extent and usually harmless. Autoimmune diseases contain two types; systemic autoimmune diseases, such as SLE, and tissue-specific autoimmune diseases, such as pemphigus²⁾.

The concept of autoinflammation was introduced by McDermott and his colleagues in 1999 with a discovery of mutations in TNF receptor, which is widely distributed on both immune and nonimmune cells, in hereditary periodic fever syndrome³⁾. Since TNF is pivotal in innate immune responses, this work confirmed that this disease process was very different from autoimmunity at molecular levels. Subsequently, a subgroup of patients with Crohn’s disease, which was conceptualised in relationship to autoimmune mechanisms, were shown to have mutations of

NOD2, a key protein associated with innate immune response in 2001⁴⁾. The NOD2-associated mutations are thought to be linked to aberrant intracellular innate immune responses to bacterial peptidoglycan. Furthermore, attacks of gout were demonstrated to be associated with activation of the IL-1 β signaling cascade, via the NALP3 inflammation, in a manner similar to some of the hereditary periodic fever syndrome in 2006⁵⁾. These series of seminal work has established the concept of autoinflammation.

Autoimmunity and autoinflammation both lead to self-directed inflammation, but with different mechanisms. While autoimmunity involves adaptive immune activation, autoinflammation involves innate immune activation. Autoinflammation is genetically related to perturbations of innate immune function, including proinflammatory cytokine signaling abnormalities or bacterial sensing or local tissue abnormalities. Disease expression of autoinflammation is determined by cells of innate immune system, including neutrophils and macrophages or nonimmune cells. Molecular clarification of the complex disease processes will further provide a better understanding of the pathogenesis and treatment of the self-directed inflammation by autoimmunity as well as autoinflammation.



References

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