Immunol Res. 2017 Feb;65(1):55-65. doi: 10.1007/s12026-016-8819-5.

Adjuvants- and vaccines-induced autoimmunity: animal models

Jiram Torres Ruiz [1] [2], Luis Luján [3], Miri Blank [2], Yehuda Shoenfeld [4] [5]

Affiliations
PMID: 27417999 DOI: 10.1007/s12026-016-8819-5

Abstract

The emergence of autoimmunity after vaccination has been described in many case reports and series. Everyday there is more evidence that this relationship is more than casual. In humans, adjuvants can induce non-specific constitutional, musculoskeletal or neurological clinical manifestations and in certain cases can lead to the appearance or acceleration of an autoimmune disease in a subject with genetic susceptibility. The fact that vaccines and adjuvants can trigger a pathogenic autoimmune response is corroborated by animal models. The use of animal models has enabled the study of the effects of application of adjuvants in a homogeneous population with certain genetic backgrounds. In some cases, adjuvants may trigger generalized autoimmune response, resulting in multiple auto-antibodies, but sometimes they can reproduce human autoimmune diseases including rheumatoid arthritis, systemic lupus erythematosus, Sjögren syndrome, autoimmune thyroiditis and antiphospholipid syndrome and may provide insights about the potential adverse effects of adjuvants. Likewise, they give information about the clinical, immunological and histologic characteristics of autoimmune diseases in many organs, especially secondary lymphoid tissue. Through the description of the physiopathological characteristics of autoimmune diseases reproduced in animal models, new treatment targets can be described and maybe in the future, we will be able to recognize some high-risk population in whom the avoidance of certain adjuvants can reduce the incidence of autoimmune diseases, which typically results in high morbidity and mortality in young people. Herein, we describe the main animal models that can reproduce human autoimmune diseases with emphasis in how they are similar to human conditions.

Keywords: Adjuvants; Alum; Autoimmunity; Pristane; Squalene; Vaccines.