An HIV-1 polytope vaccine candidate formulated inaqueousand alcoholic extracts of Propolis as adjuvant induced comparable immune responses in comparison to golden standard adjuvants

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Abstract

Using vaccination strategy many of infectious diseases controlled but in some instance vaccines are not effective and needed to improve through novel adjuvants. Today's adjuvants considered as an important part of vaccine formulation. Propolis from honey bee can stimulates the immune system and several studies have shown the modulating effects of Propolis on the immune responses. In the present study aqueous and alcoholic extracts of Propolis were studied on the HIV-1multi-epitopevaccine model. Also, the potency of these compounds compared with alum and Freund adjuvants as golden standard adjuvants.

RecombinantHIV-1multi-epitope vaccine is produced in E coli BL21 (DE3) and purified using Ni-NTA column. ExperimentalBalb/C mice were immunized subcutaneously with vaccinesin the presenceof 5mg of aqueousand alcoholicextracts of propolisasadjuvantinseparategroups,three times with two-week-intervals under the same conditionswithproper control groups. Two weeks after final injection, lymphocyte proliferation was measured by BrdU method, IL-4 andIFN-γ cytokines, as well as specific total IgG antibodies and their isotypes *IgG1*, *IgG2a* were assessed using ELISA.

Results show that theaqueousandalcoholic extractswereable toenhancelymphocyte proliferation, IL-4 and IFN-γ cytokines and antibody responseswith dominant IgG1 pattern. In addition, results show that cellular and humoral immunologic parameters show a comparable level to Freund's and Alum adjuvants. It seems that component of aqueous and alcoholic extracts can be used as vaccine excipient to improve potency and efficacy of ineffective vaccines such as HIV-1 vaccine.

Recent Publications

1- The use of propolis as vaccine's adjuvant. Ashry el SH, Ahmad TA. Vaccine. 2012 Dec 17;31(1):31-9. doi: 10.1016/j.vaccine.

2- The Adjuvant Activity of Epimedium Polysaccharide-Propolis Flavone Liposome on Enhancing Immune Responses to Inactivated Porcine Circovirus Vaccine in Mice. Fan Y, Guo L, Hou W, Guo C, Zhang W, Ma X, Ma L, Song X. Evid Based Complement Alternat Med. 2015;2015:972083.

3- Co-adjuvant effects of plant polysaccharide and propolis on chickens inoculated with Bordetella avium inactivated vaccine. Yang Y, Wei K, Yang S, Li B, Zhang Y, Zhu F, Wang D, Chi S, Jiang X, Zhu R. Avian Pathol. 2015;44(4):248-53

4- Adjuvanticity of epimedium polysaccharide-propolis flavone on inactivated vaccines against AI and ND virus. Fan Y, Wang D, Liu J, Hu Y, Zhao X, Han G, Nguyen TL, Chang S. Int J Biol Macromol. 2012 Dec;51(5):1028-32.

5- The immune enhancement of propolis adjuvant on inactivated porcine parvovirus vaccine in guinea pig. Ma X, Guo Z, Shen Z, Wang J, Hu Y, Wang D. Cell Immunol. 2011;270(1):13-8.

Biography

Pegah Karimi is a B.Sc. of Microbiology that graduated from Islamic Azad University of Tehran. She cooperate with Dr. Mehdi Mahdavi research team and works on Adjuvant and Vaccine development. Recently, she began a project with Dr. Mahdavi focusing on the increase of Influenza vaccine efficacy in aged people.

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