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Simultaneous integration of influenza vaccine and chitosan nanoparticles within CpG nucleotides oligodesoxi and check its efficiency in reducing the dose of influenza vaccine in the mouse model

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New formulations are needed to improve the efficacy of influenza vaccines. Lack of efficient delivery systems for transporting antigenic molecules to the cytosol of antigen presenting cells presents a major obstacle for antigen uptake by immune cells. To this end, influenza Whole Inactivated Virus (WIV) vaccines were formulated with chitosan nanoparticles and CpG oligonucleotide as a biodegradable delivery system and a Th1-specific adjuvant, respectively. Inactivated Influenza virus vaccine with CpG and Chitosan was injected intradermally to female Balb/C mice. Injections were single dose in high and a reduced valium. 30 days after injection, cell proliferation assay (MTT), IFN-gamma and IL-4 Elispot assays were carried out. Sera samples were collected 21 days after immunization to measure IgG1 and IgG2a levels. In addition, the mice challenged with mouse adopted virus, were monitored for weight loss. The results of analyzing the stimulation of cellular and humoral immune systems and weighting the mice show a significant stimulation of both humoral and cellular immunities; also, weight gain and a decrease in mortality in the mice receiving both dosages of inactivated influenza virus vaccines with CpG and Chitosan coating were observed. This finding demonstrated that CpG-chitosan low-dose vaccine was less costly than high-dose and helps in production of inactivated Influenza virus with CpG and its delivery by Chitosan as low-dose in return of high-dose with the same results as balanced between cellular and humeral immune responses can make enormous saving in manufacturing vaccine.

Biography

Seyed Farid Sadati has completed his Bachelor of Science from Shahid Madani University of Azarbaijan in Molecular and Cell Biology and Master of Science studies from Higher Education Institute of Rab-Rashid, in Microbiology-Biotechnology. He has two years of experience in Pasteur Institute of Iran, experiencing vaccine development and drug delivery methods by applying nanoparticles and adjuvants. He is currently pursuing his PhD studies in Ondokuz Mayis University (2017-present) in Department of Medical Microbiology.

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