

Development of avian influenza virus H5 DNA vaccine and MDP-1 gene of *Mycobacterium bovis* as genetic adjuvant.

ABSTRACT

Background Studies have shown that DNA vaccines can induce protective immunity, which demonstrated the high potential of DNA vaccines as an alternative to inactivated vaccines. Vaccines are frequently formulated with adjuvants to improve their release, delivery and presentation to the host immune system. Methods The H5 gene of H5N1 virus (A/Ck/Malaysia/5858/04) was cloned separately into pcDNA3.1 + vector. The immunogenicity of the cloned H5 DNA vaccine was tested on SPF chickens using two different approaches. First approach was using H5 DNA vaccine (pcDNA3.1/H5) and the second was using H5 DNA vaccine in addition to the pcDNA3.1/MDP1 vaccine. Ten days old chickens inoculated three times with two weeks intervals. The spleen and muscle samples from chickens immunized with H5 (pcDNA3.1/H5) and H5 + MDP1 (pcDNA3.1/H5 + pcDNA3.1/MDP1) vaccines were collected after sacrificing the chickens and successfully expressed H5 and MDP1 RNA transcripts. The sera of immunized chickens were collected prior to first immunization and every week after immunization; and analyzed using enzyme-linked immunosorbent assay (ELISA) and hemagglutination inhibition (HI) test. Results Results of competitive ELISA showed successful antibody responses two weeks post immunization. The HI test showed an increased in antibody titers during the course of experiment in group immunized with H5 and H5 + MDP1 vaccines. The result showed that the constructed DNA vaccines were able to produce detectable antibody titer in which the group immunized with H5 + MDP1 vaccine produced higher antibody comparing to H5 vaccine alone. Conclusions This study shows for the first time the usefulness of MDP1 as a genetic adjuvant for H5 DNA vaccine.

Keyword: Avian influenza virus H5N1; DNA vaccine.