

Nanochelating technology introduces a new generation of efficient adjuvants

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Prevention of hepatitis B requires a vaccine that stimulates the humoral and cellular immune responses in a balanced manner, particularly those associated with Th1 and cytotoxic T cells. Currently alum adjuvant is used in hepatitis B vaccine formulations and lacks the efficiency of establishing such immune response. Therefore, it is essential to design a new adjuvant with an efficient structure to stimulate a strong Th1 response. For the first time in the present study, we synthesized Hep-c nano-complex based on the novel nanochelating technology and evaluated its efficacy to improve the immunogenicity of the vaccine against hepatitis B.

Balb/c female mice were injected with 10 µg/ml of hepatitis B vaccine 3 times with or without different doses of Hep-c. Total serum antibody, IgG1, IgG2a, IgG2b, IgM, anti-HBs Ag, interleukin-4 (IL-4) and interferon-gamma (IFN-γ) levels were examined by ELISA reader. Proliferative response of splenocytes was evaluated using BRDU assay.

The splenocyte proliferation and serum HBs Ag-specific IgM and also IgG2a antibody titers in the HBsAg-immunized mice were significantly enhanced by Hep-c. This nano-complex promoted production of IL-4 significantly and also dramatically increased IFN-γ level in Hep-c treated groups compared to the control group.

Our findings indicated that due to the unique structure of Hep-c, it could not only preserve alum ability to produce antibodies effectively but also cover its inefficiency to induce Th1 response and prompt cellular immunity. Thus, this nano-adjuvant has the suitable potential to be used in commercial HBS vaccine formulations.

Biography

Mohammad Hassan Nazaran is owner of Nanochelating Technology and executive manager and chairman of Management Board of Sodour Ahrar Shargh Company. This technology is brought up for the first time in the history of science and is registered at US20120100372A1 in USPTO in the United States of America.

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