

Applications

- Delivery vehicle for haptens/nucleic acids
- Can be applied to enhancing an immune response or for other purposes such as gene therapy

Advantages

- Highly immunogenic
- A single particle has the ability to carry a variety of haptens
- Not cross-reactive with human HBcAg

Inventors

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Market Need

To date, vaccinations have proved to be one of the most important health advances in medical history. Vaccinations prevent serious diseases by using a vector to stimulate an immune response. Although many vaccines have been applied to prevent illnesses, there exist some disadvantages in delivery methods. These disadvantages pose a need for an improved vaccine carrier. Such disadvantages include: inability to elicit a strong TH1 immune response, possibility of acquiring a TH2-type disease if an adjuvant, such as alum, is used with peptide vaccines and negative detections during diagnosis if human HBcAg (hepatitis B viral core antigen) is applied. In order to produce a strong TH1 immune response by an antigen, large amounts of the antigen are needed which cannot be accomplished in a safe manner. As suggested previously, either in applying human or other species (such as wood-chuck) HBcAg, there are serious drawbacks in detection of HBV since anti-HBV infection is screened to determine if there is an immune response to the virus.

Technology Summary

This technology is an improved delivery system for antigens that elicits an advantageous immune response. With the use of duck HBcAg, this system is highly immunogenic by promoting a positive TH1 response that eliminates microbes produced during the infection. Also the particles associated with duck HBcAg can be disassembled and reassembled under relatively mild, non-denaturing conditions, allowing a single particle to carry a variety of haptens. Another advantage with this reversible disassembly process is the potential means to generate particles that contain nucleic acids, which may be used to stimulate an immune response or for genetic therapy. Duck HBcAg is also a beneficial method since it is similar in structure to human HBcAg but not cross-reactive with human HBcAg antibodies. This is favorable for two reasons: one, detection will not be hindered and two, individuals who have anti-human HBcAg antibodies could still be immunized with duck HBcAg.

Technology Status

U.S. Patent 7,279,555

This technology is available for licensing to industry for further development and commercialization.