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Double-Stranded RNA-binding Protein-Antigen Fusions as Adjuvanted Antigens

AzTE Case # M08-081

Inventors

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Invention Description

Vaccination is a critical tool in medicine for achieving the immunological protection of a host against a disease. Vaccines typically comprise an antigen and an adjuvant. The former is the target against which the host's immune response is raised. The latter is an essential booster of that response.

Double-stranded RNA (dsRNA) is a potent adjuvant. It acts through TLR3, RIG-I, MDA5, and other innate immunity signaling molecules to stimulate the immune response. When delivered as a bulk adjuvant, however, dsRNA is known to have toxic effects. This generally precludes its use in typical vaccination protocols.

Professor Bertram Jacobs and his colleagues at Arizona State University's Biodesign Institute have developed a unique and very powerful adjuvant technology that fuses an antigen of interest to a dsRNA-binding domain or dsRNA-binding protein.

This fusion protein or fusion conjugate carries *both* the adjuvant and antigen of interest to the antigen presenting cells, inducing a strong immune response. Since the dsRNA adjuvant here has been made essentially site-specific, this eliminates any need to administer bulk dsRNA.

This technology exploits the excellent adjuvant properties of dsRNA while effectively eliminating its toxicity.

Potential Applications

- Vaccine adjuvant

Benefits and Advantages

- Only a much lower concentration of adjuvant dsRNA is required, and this reduces the potential for side effects.
- Ease of preparing fusion protein or fusion conjugate

Intellectual Property Status:

Patent Pending

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