NRC·CNRC

Vaccine Formulation and Immunomodulation

The NRC has been developing vaccines for over 35 years and has recently expanded its activities in immunotherapy. We work with Canadian and international partners to design and test new vaccines and immunotherapeutics.

Tools to activate or supress immune reactions

Immunotherapy, the activation or suppression of the immune system to treat disease, is rapidly gaining steam. Tumour antigens can be combined with immunomodulators to attract the immune system's attention toward cancer cells. Another approach is immune check-point inhibitors that overcome cancer's ability to avoid detection. Conversely, undesirable reactions that underlie chronic immune and allergic disorders can be supressed using immunomodulators.

In prophylactic vaccines, determining the right combination of antigens, adjuvants or delivery vectors in the vaccine cargo is crucial to eliciting robust and sustainable immunity against infections caused by viral and bacterial pathogens.

Antigens

› Antigen identification, selection, production and characterization for vaccine design:

- Virus-like particle (VLP), carbohydrate, peptide, protein and lipid antigens
- Indications such as cancer, bacterial pneumonia, *C. difficile*, influenza

› Protein carriers for carbohydrate antigens to enhance immunogenicity

Adjuvants and immunomodulators

› Archaeal lipid-based adjuvants to increase systemic or mucosal immunity

› Immunomodulator for asthma treatment

› Immunopotency testing and mechanism of action

› Immunogenicity screening

Vectors

› Salmonella vectors to induce robust cell-mediated immunity against infection and cancer

› Adenoviral vectors, recombinant adeno-associated virus, and lentiviral vectors for antigen delivery and cancer therapy

› Cell lines and enabling technologies for production of VLPs and viruses

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