

## Novel lipid based adjuvants and delivery systems or induction of CD8 T cell immunity

Lakshmi Krishnan

National Research Council-Human Health Therapeutics, Canada

Novel adjuvants hold promise for developing modern subunit vaccines capable of appropriately modulating the immune response against challenging diseases such as those caused by chronic and/or intracellular pathogens and cancer. Over the past decade there has been intensive research into discovering new adjuvants, however their translation into routine clinical use is lagging. At the National Research Council (NRC) of Canada, we are leading efforts in the development of novel lipid adjuvants and delivery systems. Archaeosomes, prepared from isoprenoid lipids extracted from archaea, are one such adjuvant in development. Archaeosomes have both stand-alone immuno-modulator and carrier properties for vaccine antigens. Our innovation includes use of semi-synthetic archaeosomes, wherein an archaeal core lipid serves as a lipid precursor for synthesis of a series of glyco-archaeols and phospho-archaeols. In this way archaeal synthetic lipid mimetics not limited to those found naturally in Archaea, were screened to optimize the carrier/adjuvant effect desired. Modified formulations or archaeal lipids also evoke a strong mucosal immunity. Furthermore, we have developed novel recombinant bacterial and adenoviral vectors for expression of vaccine antigens. Our development processes focus on ensuring cost-effective bioprocessing, scale-up and regulatory considerations alongside efficacy. To bridge innovation gaps and unmet needs for hastening the development of adjuvants and vaccines from bench to clinical testing we have recently identified an opportunity for creation of a Canadian Adjuvant Development Network. Furthermore, we are developing bioanalytics for correlates of vaccine protection. This presentation will detail our key adjuvant technologies and vaccine biomarker research.

### Biography

Lakshmi Krishnan completed her PhD from the National Institute of Immunology in India and Postdoctoral studies from University of Alberta, Canada. She is the Team Leader for Immunomodulation and flow cytometry facility at NRC. She is also the Adjuvant Technologies Lead of the NRC-vaccine program management team and an Adjunct Professor at the University of Ottawa. She has published >50 articles in peer reviewed journals and is an inventor on several patents. She collaborates with vaccine industry leaders and has received funding from the Ontario Institute for Cancer Research, Canadian Institutes of Health Research and National Institutes of Health (USA).

[Lakshmi.Krishnan@nrc-cnrc.gc.ca](mailto:Lakshmi.Krishnan@nrc-cnrc.gc.ca)