

# 9<sup>th</sup> Global Summit and Expo on Vaccines & Vaccination

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## Michael Vajdy

EpitoGenesis, Inc., USA

### Immunomodulatory properties of vitamins and flavonoids as vaccine adjuvants against infectious diseases

During the past decades, immunologists and vaccinologists have used *in vitro* and *in vivo* models to identify and characterize immunomodulating activities of potential vaccine adjuvants and delivery systems. Intense research in vaccine adjuvant discovery has focused on toll-like receptors, mutant toxins and viral and bacterial vectors. However, recent evidence suggests that nutritive components such as vitamins and a subclass of polyphenols also possess immunomodulating properties without the potential toxic side effects of mimicking danger signals in traditional adjuvant research. We have designed a chemically well-defined and GMP-manufacturable nutritive immune-enhancing delivery system (NIDS), as a nano-emulsion, composed of a combination of two vitamins, and a plant based polyphenol in various delivery systems including organic and inorganic pharmaceutically acceptable carriers. We present *in vitro* and *in vivo* data to demonstrate paradoxical immunomodulating activities of select vitamins and polyphenols compared to well-known adjuvants. We further demonstrate significant enhancement of adaptive local and systemic immune responses, in the absence of typical proinflammatory cytokines and chemokines, following mucosal and systemic vaccinations with NIDS and compared to the responses following vaccinations with other licensed or in development vaccine adjuvants and delivery systems. Furthermore, we demonstrate that our adjuvant's mechanism of action is through the action of a single cytokine and its receptor. Our results demonstrate a safer approach to vaccine adjuvant design with the potential to open a new era in the design and development of safe and effective future vaccines.

### Biography

Michael Vajdy is Co-founder, President and Chief Scientific Officer of EpitoGenesis, Inc., established in 2008. He is a Mucosal Immunologist and Vaccinologist with over 24 years of academic and industry experience in designing mucosal and systemic adjuvants and vaccines, studying mechanisms of mucosal and systemic immune induction, long-term immunological memory and product development. Following his PhD studentship at Goteborg University, he completed Post-doctoral fellowships at Loyola University Chicago and at Harvard Medical School. He was recruited to Chiron Corporation where his work was instrumental in the development of mucosal and systemic vaccine products against various infectious diseases. He also held simultaneous academic positions as Adjunct Clinical Assistant Professor with the Department of Internal Medicine, Division of Infectious Diseases and Visiting Associate Professor at Department of Medical Microbiology and Immunology, University of California, Davis. He was also a Faculty member with the graduate group, Department of Comparative Pathology, University of California, Davis. In these capacities, he trained student/fellows and wrote collaborative NIH grants. He has authored over 55 peer reviewed manuscripts and book chapters. He is the Editor of a book entitled "Immunity against Mucosal Pathogens" and has been PI or Investigator on several NIH grants. He is currently an Adjunct Full Professor at the Department of Pathobiology, University of Connecticut.

[vajdy@epitogenesis.com](mailto:vajdy@epitogenesis.com)

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