

9th Global Summit and Expo on Vaccines & Vaccination

November 30-December 02, 2015 San Francisco, USA



Michael G Agadjanya

University of California, USA

Active vaccination strategies to prevent and reverse Alzheimer's Disease (AD)

Traditional vaccination against infectious diseases relies on generation of cellular and humoral immune responses that act to protect the host from overt disease even although they do not induce sterilizing immunity. More recently, attempts have been made with mixed success to generate therapeutic vaccines against a wide range of non-infectious diseases including allergy, cancer, diabetes, drug addiction and autoimmune diseases, amongst others. However, amongst the most radical innovations was therapeutic vaccination for neurodegenerative disorders, including Alzheimer's disease (AD) and Parkinson's disease. Following the exciting first report in 1999 of successful vaccine prevention of progression of an AD animal model, various vaccines targeting beta amyloid (A β) have progressed to human clinical trials, with mixed results. More recently, AD vaccines based on tau protein have advanced into clinical testing.

While a successful AD vaccine remains tantalizing close the mixed results obtained so far in clinical trials of AD vaccines including many difficulties and misconceptions encountered on the path to a successful AD vaccine will be presented. More specifically, we will discuss requirement of (i) better standardization of immunological efficacy measures of anti-A β and anti-tau vaccines, (ii) better methods to improve vaccine immunogenicity such as novel adjuvants and the design of AD vaccines, (iii) the most promising strategies for using active immunization targeting A β and/or tau pathological proteins for prophylaxis and/or prevention of early AD progression.

Biography

Michael G. Agadjanyan is currently the Vice President, Professor and Head of the Department of Molecular Immunology at the Institute for Molecular Medicine, Huntington Beach, California and Adjunct Professor at the MiND Institute at UCI. He was formally a Visiting Professor at the Wistar Institute and at the University of Pennsylvania, Philadelphia, PA. Before coming to the US in 1991 he was a Professor at the Mechnikov's Institute for Vaccines and Sera in Moscow at the Russian Academy of Medicine. In the last 25 years he has received numerous grants from the NIH as well as foundations such as the Susan G. Komen Foundation, and the Alzheimer's Association supporting studies for the generation of humanized monoclonal antibodies and vaccines.

magadjanya@immed.org

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