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Can mucosal immunity succeed where other systemic immune responses failed? Intranasal immunization using a Nanostat™ platform technology protected against respiratory and sexually transmitted diseases in the appropriate animal challenge models

The list of failed vaccines against respiratory and sexually transmitted diseases in late clinical development is growing. Recent failures include parenterally administered vaccines against RSV and genital herpes (HSV2). Further, the emerging pertussis infections and outbreaks on the background of a well-established acellular pertussis vaccine is also alarming. Mucosal surfaces are the port of entry for respiratory and sexually transmitted diseases. Yet most vaccines evaluated or licensed to date are parenterally administered and target systemic responses. Targeting and triggering mucosal immunity may bring to the table another efficient arm of the immune response that may prove essential in preventing or treating sexually transited or respiratory infections. Nano Bio is developing an intranasal nanoemulsion adjuvant/delivery (NE) that induces mucosal Th17 responses and enhances homing of IgG and IgA -secreting B-cells to localize in the mucosal tissues. Evaluation of intranasal NE-RSV and NE-HSV2 vaccines in primary animal models demonstrated that the vaccinated animals were protected against disease, colonization, shedding, as well as chronic infection in the case of HSV2 challenge. These data suggest that mucosal immunity may be essential for successful development of efficacious vaccines against these mucosal pathogens and maybe improvement and expanding coverage of existing vaccines such as pertussis and flu vaccines. Mucosal Immunization and protection data from HSV2 in guinea pigs, RSV in monkeys, and flu in ferrets will be shared.

Speaker Biography

For more than 25 years Dr. Fattom led research in vaccine discovery and development against infectious diseases and addiction. After a 5 years tenure in vaccine research at the NIH, under Dr. John Robbins, Dr. Fattom moved to the biotech industry, he joined Nabi Biopharmaceuticals, to lead bacterial vaccines development. His work on *Staphylococcus aureus* pathogenesis, determination of virulence factors, and identifying protective antigens for developing a protective vaccine against this pathogen are well recognized in the field. Nicotine vaccine, a second lead vaccine developed by Dr. Fattom for smoking cessation was also developed through phase II clinical trials. In 2010, Dr. Fattom joined NanoBio Corp. as a Sr. VP of vaccine research and development. For the last 6 years, his efforts were focused on developing intranasal vaccines against respiratory (Flu, RSV, Anthrax, and Pertussis), and sexually transmitted diseases (Genital herpes HSV2, Chlamydia, and HIV). Target indication for these vaccines is to protect against disease, carriage, shedding/transmission. Dr. Fattom holds an Adjunct professor at the University of Michigan since 2012. He authored >70 publications and >20 issued patents. He is a reviewer for NIAID and NIDA grant applications and a reviewer for several journals including Vaccine, Infection and Immunity, Human Vaccines & Immunotherapeutics, and NPJ Vaccine.

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