Vaccine Antigen Delivery:

New approaches to vaccine development

ABSTRACTS

25th - 27th October 2016

Location: **Online**

EuroSciCon

This international event will discuss new cellular, molecular and chemical approaches to improving immunisation efficacy.

This event has CPD accreditation

www.lifescienceevents.com/vaccine2016

#VaccineESC

This abstract book will be finalised two weeks before the event

Table of Contents

Invited Speakers Abstracts 4

ARV-derived IC-Tagging methodology for production of epitope-loaded protein microspheres for adjuvant-free vaccination 4

Multi-tasking influenza vaccines to provide rapide innate and subsequent long-term adpative immunity against influenza and secondary pneumococcal infections 4

Lentiviral pseudotypes as a tool for vaccine efficacy testing 4

Towards development of more effective vaccines: new generation of potent adjuvants with antigen delivery ability. 4

Increasing efficacy of therapeutic vaccination against cancer 4

Personalized nanomedicine for cancer vaccination 5

Exploiting materials chemistry for tuneable vaccine formulations 5

Genetics epigenetics and vaccine protective efficacy 5

Oral Presentation Abstracts 5

Day 1: 5

Day 2: 5

Day 3: 5

Poster Presentation Abstracts 6

Invited Speakers Abstracts

ARV-derived IC-Tagging methodology for production of epitope-loaded protein microspheres for adjuvant-free vaccination

Dr. Jose Martinez Costas, Universidad de Santiago de Compostela, Spain

We have developed a method to generate protein microspheres containing any antigen of interest that are potent inducers of the immune system. The sphere and the coupling between the antigen and the sphere are both carried out by the cell by means of a molecular tagging method named "IC-Tagging", and they work nicely as subunit vaccines without any adjuvant. We have modified the method to work also inside the endoplasmic reticulum, so it can be also used for glycoproteins to mimic the surface of enveloped viruses.

Multi-tasking influenza vaccines to provide rapide innate and subsequent long-term adpative immunity against influenza and secondary pneumococcal infections

Dr. Brendon Yew Loong Chua, The University of Melbourne Australia

The threat to global health posed by influenza warrants continued efforts to improve the protective capability of vaccines particularly against outbreaks and their sequelae. By using a simple TLR2 agonist-based vaccine delivery system, an inactivated detergent-split influenza vaccine can be made to provide immediate antigen-independent anti-viral protection mediated by innate immunity while giving the adaptive immunity time to effect long-term antigen-dependent protection. The value of conferring of dual functionality on influenza vaccines could improve community protection particularly during periods between an outbreak and when a vaccine becomes available or in scenarios when there is imperative for vaccination against novel strains.

Lentiviral pseudotypes as a tool for vaccine efficacy testing

George Carnell, Medway School of Pharmacy, Universities of Greenwich and Kent, Chatham, United Kingdom

The use of pseudotypes in a serological setting, whether this means testing serum samples pre and post vaccine administration, or general screening for crossneutralising antibodies, etc.

Towards development of more effective vaccines: new generation of potent adjuvants with antigen delivery ability.

Dr. Ilona Kubajewska, UCL School of Pharmacy, London UK

Pathogens and cancers remain great challenges in biomedicine. More robust adjuvants are needed to enhance potency of prophylactic and therapeutic vaccines against those threats. We are first to discover adjuvantic properties among a family of hybrid inorganic-organic polymers with porous structures that could facilitate antigen delivery. We addressed their immunogenicity and toxicity on human dendritic cells – key antigen-presenting cells involved in stimulating immunity to pathogens upon vaccination – and observed phenotypic changes rendering stronger and multifaceted immune responses. Our polymers significantly outperformed alums commercially used as vaccine adjuvants and also proved to be less toxic. Hence, they could serve as new-generation adjuvants for vaccines and immunotherapies.

Increasing efficacy of therapeutic vaccination against cancer

Mr Staffan Holmberg, National Veterinary Institute, Frederiksberg, Denmark

It is well established that the immune system has a key role in protecting against or promoting tumorigenesis, and that this balance can be tipped by treatment. We elucidated the immunological effects induced in patients with hematological cancers by treatment with a hypomethylating agent. These data led to the rational design of an immuno-chemotherapeutic clinical trial currently ongoing. Further I will include data from our exploration of pigs as a large animal model for anti-cancer vaccination. Pigs are more similar to humans than rodents in terms of both immunology, physiology and size and may thus serve as an advantageous model.

EuroSciCon Ltd. Registered in England and Wales, Company number: 4326921, Trading Address: Euroscicon Ltd, Highstone House, 165 High Street, Barnet, Herts. EN5 5SU, UK. Registered Office: 47 High Street, Barnet, Herts, EN5 5UW, UK

Personalized nanomedicine for cancer vaccination

Assistant Professor James Moon, Biointerfaces Institute, Ann Arbor, MI, United States

Recent innovations in DNA/RNA sequencing have allowed for the identification of patient-specific tumor neo-antigens, ushering in the new era of personalized cancer vaccines. Peptide vaccines may serve as an ideal platform for neo-antigen vaccines, but their efficacy in clinical trials have been limited. Here we present an alternative strategy where preformed nanocarriers are mixed with Ag peptides and adjuvants to produce personalized cancer vaccines. We show that nano-formulations can co-deliver Ag and CpG to draining lymph nodes and elicit potent CD8+ cytotoxic T lymphocyte responses directed against neo-antigens, leading to substantially extended survival of tumor-bearing mice.

Exploiting materials chemistry for tuneable vaccine formulations

Dr. Gareth R Williams, UCL School of Pharmacy, London, United Kingdom

In order to ensure that robust immunity is inculcated, an 'adjuvant' is usually added to inactivated or subunit vaccines, with inorganic compounds known as 'alums' (AlOOH or amorphous aluminium hydroxyphosphate) used in the majority of cases. Alum can lead to strong humoral Th2 immunity to extracellular microbes, but does not provoke the type of cellular Th1 immune response required to overcome intracellular infections (e.g. viruses). In this presentation I will describe work using an alternative inorganic system, the layered double hydroxide family of materials, to redress this deficit.

Genetics epigenetics and vaccine protective efficacy

Dr. Huanmin Zhang, USDA, Agriculture Research Service, East Lansing, US

Delivery of vaccine triggers a chain of reaction toward immunity involving varied types of cells including B cell, helper T cell, killer T cell, and plasma cell. The consequential effects of this chain reaction are to prevent/reduce infection or prevent/reduce/slow progression of infectious diseases. However, the effect of such intervention varies significantly among recipients, which reportedly is attributable to genetics and epigenetics of the recipients. Data from recent studies, including GWAS and RNA_Seq projects, will be discussed to illustrate genetic variation in relation to vaccine protective efficacy, genetic and epigenetic variation in response to Marek's disease vaccines in chickens. It is anticipated that a deep insight into genetic and epigenetic roles involved in vaccination processes will facilitate critical improvement of immunization efficacy.

Oral Presentation Abstracts

Oral presentations will be added after the submission deadline

Day 1:

Day 2:

Day 3:

Poster Presentation Abstracts

Poster abstracts will be finalised weeks before the event