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3rd Euro-Global Conference on

Infectious Diseases

September 05-06, 2016 Frankfurt, Germany

Keynote Forum

(Day 1)

Carlos Alberto Guzman, J Infect Dis Ther 2016, 4:5(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.010

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Carlos Alberto Guzman

Helmholtz Centre for Infection Research, Germany

New technologies for innovative needle-free vaccines

Traditional vaccines consist of attenuated or inactivated pathogens, whereas subunit vaccines are based on purified antigens. Although it would be preferable to exploit noninvasive administration strategies, most vaccines still made use of needles. In this regard, mucosal vaccines and nanoparticle (NP)-based formulations delivered by transfollicular (TF) route are gaining interest. However, poor immunogenicity and transport across barriers limit these approaches. Adjuvantation might overcome these constraints, but only few adjuvants are available for human use and none is active by mucosal route. Our adjuvant development program led to the discovery of well-defined synthetic immune modulators, which are active when administered by mucosal route and improve the efficacy of NP-based formulations. Among them, cyclic-di-nucleotides (CDNs) exhibit strong immune modulatory effects on antigen presenting cells by activation of the type-I IFN and TNF pathways. Co-administration of CDNs with purified antigens induces strong humoral and cellular responses, which were characterized by a balanced Th1/Th2 profile and induction of cytotoxic cells. Influenza vaccines adjuvanted with CDNs confer protection against virus challenge in different preclinical models, including aged mice. Co-administration or formulation with antigen loaded NPs also allowed triggering antigen specific humoral and cytotoxic responses after TF vaccination, even with a completely intact skin barrier. This new generation of synthetic adjuvants with well defined molecular targets represents a powerful tool for the rational design of novel vaccines and immune therapies.

Biography

Carlos Alberto Guzman has graduated in Medicine and become board certified in Medical Bacteriology in Argentina. Later, he was graduated as a Doctor of Medicine and Surgery and obtained his Doctorate in Microbiological Sciences, University Genoa, Italy. In 1994, he became Head of the Vaccine Group at German Research Centre for Biotechnology, Germany. In 2005, he was appointed as the Head of the Department of Vaccinology and Applied Microbiology (HZI), becoming later APL-Professor at the Medical School and Member of the Centre for Individualized Infection Medicine, Hannover. His work was instrumental for developing new adjuvants and antigen delivery systems, leading to more than 200 publications.

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Pietro Mastroeni, J Infect Dis Ther 2016, 4:5(Suppl)
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Pietro Mastroeni
University of Cambridge, UK

Immunity, vaccination, antimicrobial treatment and *in vivo* pathogen behavior: From the laboratory to clinical setting in endemic regions

Accurate targeting of appropriate vaccination and therapeutic strategies must take into consideration the behavior of pathogens within the host. Animal models have provided many insights into those host-pathogen relationships that control bacterial infections. New approaches based on advanced microscopy, individually-traceable molecularly tagged bacterial populations and mathematical modeling have exploited the robust and tractable *Salmonella enterica* murine infection model to capture the many variables that underpin the location, spread, division, death and persistence of microorganisms within an animal. Immunological or genetic manipulations of B and T-cell mediated immunity, signaling pathways, cytokine networks and phagocyte effector functions modulate host resistance/susceptibility and have provided solid information on which immunological effectors control and eliminate disease. These models have also enabled us to test different classes of vaccines and antibiotics and determine which ones are likely to induce the highest level of protection in other animal species and in humans. The higher incidence of some invasive bacterial infections in patients with genetic immunodeficiencies, individuals carrying specific immune gene alleles and patients with comorbidities (e.g., malaria, severe anemia, HIV), indicates common resistance/susceptibility traits between mice and humans. The presence of comorbidities in endemic areas poses serious challenges to disease prevention by undermining those elements of the innate immune response that are the foundations upon which vaccines build resistance. There are currently large gaps in our knowledge of the mechanisms that control many bacterial infections in humans and we still do not fully understand of how comorbidities, alone or in combination, impair immunity. A major challenge ahead is to link risk factors/comorbidities with specific immunological/functional defects that determine increased susceptibility to infections in endemic areas. This will provide a rational pathway to develop approaches and tools to restore such defects in individuals with high risk of contracting disease and will inform development and rational use of vaccines and antimicrobial treatments.

Biography

Pietro Mastroeni has received degree in Medicine and Surgery from the University of Messina, Italy. He has then moved to the University of Cambridge, UK and completed his PhD before becoming a Research Fellow at Imperial College, University of London, UK. He is currently a Reader in Infection and Immunity at the University of Cambridge. He has published more than 100 papers in reputed journals and serves as an Editorial Board Member.

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Nito Panganiban

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Bunyaviruses and other emerging zoonotic RNA viruses

There is an expanding group of identified emerging zoonotic RNA viruses whose prevalence and sensitivity to anthropogenic disruption epitomize the ongoing "third epidemiological transition" in human history, which is marked by emergence of novel pathogens and re-emergence of previously identified infectious microbes. Examples of recent and ongoing outbreaks initiated by these RNA viruses include hemorrhagic fever following infection by the filovirus, Ebola and fetal neuromal formation arising from infection by the Flavivirus, Zika. The bunyaviruses comprise the largest group of RNA viruses and include multiple emerging zoonotic species that are pathogenic in humans. This family of viruses has a genome composed of three minus strand RNA segments. Using *Sin Nombre Hantavirus* and Rift Valley fever virus as models, we have been elucidating multiple facets of bunyavirus biology including fundamental strategies of the virus for genome expression, replication and packaging and we have been exploring key features of virus-host interaction. The replication of these viruses intersects with cytoplasmic RNA metabolism pathways physically associated with processing bodies (PBs) and stress granules (SGs). This association has important implications for mRNA synthesis and genome replication. Specific components of the *cytoplasmic granules* are also important for efficient virus replication, playing a direct role in viral RNA function. Generation of a specific mechanistic picture of how these cellular components function in virus replication will provide insight into the intricacies of virus replication. These cellular components are also potential targets for broad-spectrum antivirals as these cellular co-factors appear to be required for the replication of multiple diverse bunyaviruses.

Biography

Nito Panganiban is a Professor and Interim Division Chair of Microbiology at the Tulane National Primate Research Center, Chief Scientific Officer at Peptineo and a Member of the Department of Microbiology and Immunology at the Tulane University School of Medicine. The focus of his academic research lab is centered on diverse emerging RNA viruses with emphasis on pathogenic, zoonotic RNA viruses including members of the bunya and Flavivirus families including Zika virus, Rift Valley Fever, Crimean Congo hemorrhagic fever and Hantaviruses.

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Bogdan Circiumaru, J Infect Dis Ther 2016, 4:5(Suppl)
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Bogdan Circiumaru

Bogdan Circiumaru

The clinical syndromes produced by the offensive biological agents

Introduction: The offensive use of the microbiological agents (as components of the "biological weapons"), could produce a different clinical evolution compared to the natural one. Although used during the history, then banned through international treaties, they became as non-conventional induced threats, mainly by the actual global terrorism development.

Objectives: The approach to the diseases produced by the offensive microbiological agents has a greater clinical and therapeutical efficiency by grouping them into clinical syndromes. The main task is to raise the efficiency of the diagnosis, prophylaxis and the treatment of the diseases that could be produced by the deliberate use of the high clinical virulent microbiological agents as well as to propose guidelines for those cases.

Methods: Teaching during ETIDE (European Training in Infectious Diseases Emergencies), using the specialty literature resources and the clinical practice, in order to train the trainers to identify the most efficient means for triage, diagnosis and therapy for the threat of the offensive biological agents.

Results: The clinical syndromes produced by the offensive biological agents: Cutaneous (smallpox), respiratory/influenza-like (anthrax), digestive (oropharyngeal tularemia), neurologic (botulism), sepsis (plague). I prepared the trainers for the hypothesis of the fast growing number of cases and identified the existing/potential medical facilities that could cope to the new appearing cases. These were lately spread by the trainers, by organizing courses in their own countries.

Conclusions: The clinical syndromic approach for the infectious diseases produced by the offensive biological agents has important advantages, namely a ready and efficient answer to the bioweapon threats as well as a practical and efficacious way to the biodefense. Preparing the quick solution towards such threats signifies a proper strategically approach in the view of the actual bioweapon proliferation.

Biography

Bogdan Circiumaru is a Consultant in Infectious Diseases at the "Matei Balş" National Institute of Infectious Diseases in Bucharest, Romania. He has qualified in 1989 at the Bucharest State University of Medicine, obtained a Diploma in Tropical Medicine and Hygiene and MSc in Infectious Diseases from the University of London, UK. He has completed his PhD at the Bucharest State University of Medicine. He is an experienced Clinician with good skills in clinical infectious diseases and tropical pathology. He has worked under the supervision of Prof. Jon Cohen, David Mabey (London) and Prof. Antonella D'Arminio Monforte (Milan). He has numerous publications, especially in the infectious and tropical diseases, being awarded by the University of Bucharest with The Diploma of Excellence for the Book "Compendium of Infectious Diseases". He has also published a paper into the book: "NBC Risks Current Capabilities and Future Perspectives for Protection" (NATO Science Series 1999).

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