HUMAN VACCINES & IMMUNOTHERAPEUTICS
2019, VOL. 15, NO. 9, 2006–2008
https://doi.org/10.1080/21645515.2019.1660544

Taylor & Francis
Taylor & Francis Group

OVERVIEW

OPEN ACCESS Check for updates

2018 ISV Congress: advances in the 100 years since the world's deadliest pandemic

Denise L. Doolan [a] and Ted M. Ross [b]

[a]Centre for Molecular Therapeutics, Australian Institute of Tropical Health and Medicine, James Cook University, Cairns, Australia; [b]Center for Vaccines and Immunology, University of Georgia, Athens, GA, USA

The *International Society for Vaccines (ISV)* is a global not-for-profit organization that aims to encourage, establish and promote the development and the use of vaccines to prevent and control infectious and non-infectious diseases in humans and animals.

The ISV Annual Congress is the world's largest scientific conference in the field of vaccines and covers a broad range of topics related to vaccines and immunotherapies, reporting the latest advances in the field and discussing challenges and opportunities. Alternating between the USA, Europe and Asia, the ISV Annual Congress has become a leading venue bringing together individuals from all sectors of the global vaccine community with a balanced representation of scientists, officials, and practitioners in academia, industry, public health, non-governmental and philanthropic institutions, among others.

The 2018 ISV Congress was held in Atlanta, USA, on 28th-30th October 2018. Atlanta is the home of the U.S. Centers for Disease Control and Prevention, as well as six medical research institutions. The timing of the Congress coincided with the 100th anniversary of the devastating 1918 influenza pandemic which infected a third of the world's population and claimed more than 50 million lives - more lives than both World War I and World War II combined. This acknowledges the positive effect that vaccines can have on protecting our society against disease.

The co-chairs of the 2018 ISV Congress were Denise Doolan (James Cook University, Australia) and Ted Ross (University of Georgia, USA). They were supported by an international Scientific Committee composed of high profile individuals representing a broad portfolio of expertise from academia, industry and government: Randy Albrecht (Icahn School of Medicine at Mount Sinai, USA), Guirakhoo Farshad (GeoVax, USA), Lars Frelin (Karolinska Institutet, Sweden), Davinder Gill (Hilleman Laboratories, India), Ali Harandi (University of Goteborg, Sweden), Stephen Hoffman (Sanaria, USA), Linda Klavinskis (King's College London, UK), Karl Ljungberg (Karolinska Institutet, Sweden), Janet McNicholl (Centers for Disease Control and Prevention, USA), Ed Mocarski (Emory University, USA), Marty Moore (Meissa Vaccines, USA), Mark R. Schleiss (University of Minnesota, USA), Sean Tucker (Vaxart, USA), Jeffrey Ulmer (GlaxoSmithKline, USA), Thiru Vanniasinkam (Charles Sturt University, Australia), Vish Nene (International Livestock Research Institute, Kenya), Heather Wilson (University of Saskatchewan, Canada), Anna-Lise Williamson (University of Cape Town, South Africa), and Suh-Chin Wu (National Tsing Hua University, Taiwan). These individuals played a key role in determining the content of the Congress.

The 2018 ISV Congress was attended by 298 individuals from 29 countries spanning the globe. The Congress featured 35 international leading experts as keynote and symposium speakers, as well as 52 oral presentations selected from abstracts submitted by the global vaccine community and 92 posters.

In almost three days of tightly packed plenary and breakout sessions, the large number of oral presentations, posters, and special sessions reported recent findings on a wide range of disease targets and addressed topical issues among the disciplines of vaccinology and immunotherapeutics. Plenary sessions included *Influenza 1918 to 2018; Vaccines for Influenza Viruses; Host Immune Response to Vaccination; Human Vaccine Trials; Public Health, Public Policy, and Vaccine Acceptance*; and *The Future of Vaccines*. The nine concurrent sessions spanned a breadth of topics including *Viral Vaccines; Non-Viral Vaccines; Vaccines for Emerging and Re-emerging Infectious Diseases; Cancer Vaccines; One Health and Veterinary Vaccines; HIV/AIDS; Vaccine Technologies, Formulations, and Delivery; Vaccine Evaluation*; and *Immunomodulators and Vaccines*. Speakers conveyed the most up-to-date information on the challenges of those diseases, as well as the promising pipelines of vaccines and new vaccine technologies. Other talks conveyed the public health perspective and illustrated the challenges faced in educating the global community about vaccine acceptance. The opening Keynote Lecture given by Dr. Julie Gerberding (Executive Vice President of Merck) honored Dr. Adel Mahmoud (24th August 1941 – 11th June 2018). Dr. Adel Mahmoud served as President of Merck Vaccines from 1998 until 2006, overseeing the creation and marketing of several vaccines that brought major advances in public health. He was also a champion of global health issues and the need for new approaches to develop vaccines for emerging markets.

The *Career Development Session* with cross-representation of panel members from academia, industry, and not-for-profit organizations provided a forum for early career researchers to engage with vaccine researchers in different areas and obtain career advice. *Breakfast with the Fellows* held on the second

CONTACT Denise L. Doolan denise.doolan@jcu.edu.au Centre for Molecular Therapeutics, Australian Institute of Tropical Health and Medicine, James Cook University, Cairns QLD 4878, Australia

day gave attendees an opportunity to meet with ISV Fellows in an informal setting. Many robust discussions took place during the well-attended poster sessions, and tea and lunch breaks provided other networking opportunities. A highlight was the Gala dinner held in the spectacular surroundings of the Fernbank Museum of Natural History.

ISV Trainee Awards recognized five early career researchers based upon an evaluation of abstracts by the Scientific Committee. ISV also sponsored awards for 10 scientists from Lower- and Middle-Income Countries. Poster awards recognized the best posters presented at the Congress, as judged by a panel of experienced vaccinologists. A Vaccine Renaissance Scholarship for Women and Minority Delegates was sponsored by EpiVax Inc. Additional awards sponsored by the DNA Vaccine Society included the Maurice Hilleman Award given to the lead author of the most outstanding submitted abstract; and the Richard Ginsberg Award given to the best abstract submission by a trainee.

Papers included in this *Special Feature* of *Human Vaccine and Immunotherapeutics* showcase some of the exciting science and tremendous advances being made in the field of vaccinology that were presented at the 2018 ISV Congress.

John Oxford and Douglas Gill (Queen Mary University London, UK) contribute a commentary on "***A possible European origin of the Spanish influenza and the first attempts to reduce mortality to combat superinfecting bacteria: an opinion from a virologist and a military historian***" (p 2009). They revisit published literature and physician notes in Europe and the United States in conjunction with modern tools of science to investigate where and how the first outbreaks of the Spanish Influenza Pandemic occurred. They consider 'gain of function' experiments whereby key mutations in a potentially pandemic virus can be identified by deliberately introducing mutations in the laboratory setting, and phylogenetics combined with molecular clock analysis. The authors conclude by describing original efforts to construct the first universal vaccine against influenza.

Continuing the theme of influenza, Amanda Skarlupka, Ted Ross and colleagues (University of Georgia, USA) report that a "***Computationally optimized broadly reactive vaccine based upon swine H1N1 Influenza hemagglutinin sequences protects against both swine and human isolated viruses***" (p 2013). This work addresses the zoonotic potential of swine influenza viruses which are prevalent in different populations throughout the world. Building on studies demonstrating broad protection against a panel of human H1N1 viruses using HA antigens derived by the COBRA methodology, the authors expand COBRA to HA sequences derived from swine H1N1 and H1N2 isolates and evaluate vaccine-induced antibody responses and protection against pandemic-like viruses. They conclude that computationally optimized HA antigens are a viable way of designing vaccines with broad application for both humans and swine and that development of a pan-swine influenza virus vaccine is feasible.

Other studies by the same group, authored by Michael Carlock et al., describe the "***Impact of age and pre-existing influenza on the induction of human antibody responses against influenza B viruses***" (p 2030). They evaluate the impact of repeat vaccinations with split inactivated Fluzone on the breadth and durability of functional antibodies in individuals of a broad age range. The researchers show that influenza vaccination in both younger and older people elicited broadly-reactive immune responses within a lineage, as well as cross-reactive immune responses between lineages.

Investigating the immunology underlying the induction of antibody responses, Jonathan Gershoni (Tel Aviv University, Israel) introduces the concept of "***B-cell restriction – an alternative piece to the puzzle***" (p 2044). The commentary summarizes three critical aspects of the B-cell response toward infectious agents, whereby antibodies induced by vaccination and subsequent boosts recognize the pathogens in future encounters and effectively knock them out. However, in the case of hypervariable pathogens such as influenza and HIV where rapid genetic drift assists in their ability to evade immune surveillance, Dr. Geroshini proposes that the B-cell response might be "too good" and that restricting B-cell activities may effectively counteract the genetic diversity.

Looking at maintenance of antibody responses post vaccination, Joseph Kwadwo Larbi Opare et al. (University of Ghana, Ghana) report on "***Poliovirus antibody levels and lameness among individuals in three regions of Ghana***" (p 2050). Since Ghana was declared polio-free in 2015, the authors investigate the level of polio-neutralizing-antibody levels to three polio serotypes in three regions of Ghana, to identify possible immunity gaps. They find that polio-neutralizing antibodies decrease with age, and that the mother's education level is important as low seroprevalence of polio-neutralizing antibodies associate with low school attendance. The authors suggest that a young-adult booster-dose of polio vaccine should be considered in Ghana EPI to minimize the risk of wild poliovirus infection.

On the other end of the spectrum, Megan Young (Griffith University, Australia) reviews "***The indications and safety of polyvalent immunoglobulin for post-exposure prophylaxis of hepatitis A, rubella and measles***" (p 2060). She summarizes the safety profile of polyvalent immunoglobulins blood products derived from pooled blood donations which are used for post-exposure prophylaxis of these diseases, and current recommendations for their use based on national guidelines.

In the field of hemorrhagic fever viral diseases, Jingjing Jiang, Stephanie Ramos and colleagues (Inovio Pharmaceuticals Inc. and USAMRIID, USA) report on "***Immunogenicity of a protective intradermal DNA vaccine against Lassa Virus in Cynomolgus macaques***" (p 2066). They show that an optimized DNA vaccine can generate functional specific T-cell and antibody responses based on relevant assays, providing a framework to identify correlates of protection and characterize immune responses in future clinical trials for this severe disease.

Evaluating a non-viral pathogen, Viviana Cobos Jiménez, Karen Norris and colleagues (University of Georgia, USA) report that "***Immunization with Pneumocystis recombinant KEX1 induces robust and durable humoral responses in immunocompromised Non-Human Primates***" (p 2075). *Pneumocystis jirovecii* is an opportunistic fungal pathogen which causes life-threatening pneumonia in immunocompromised individuals. The authors describe studies showing that a recombinant protein KEX1 induces protective immunity against the development of *Pneumocystis* pneumonia in a non-human primate model of HIV-induced immunosuppression.

Finally, Richard Clarke, Pauline Paterson and colleague (London School of Hygiene and Tropical Medicine, UK) address the question "***Do previously held vaccine attitudes dictate the extent and influence of vaccine information seeking behaviour during pregnancy?***" (p 2081). They conclude that intention to vaccinate during early pregnancy plays a role in whether the information found through seeking influences women toward or away from vaccination.

We hope that you enjoy the manuscripts included in this *Special Feature* of *Human Vaccines and Immunotherapeutics*.

In closing, we look forward to welcoming you to the 2019 Congress being held in the beautiful medieval city of Ghent, Flanders-Belgium, on 27th-29th October 2019. Ghent has an impressive history going back 15 centuries and is home to famous museums and historical buildings straddling idyllic canals. Ghent and its surroundings are home to a vibrant vaccine and bioscience community of universities, biotechnology institutes, and pharmaceutical companies, providing an ideal venue for hearing the latest advances in vaccinology.

ORCID

Denise L. Doolan http://orcid.org/0000-0001-7354-8817
Ted M. Ross http://orcid.org/0000-0003-1947-7469