

5th World Congress on

Virology

December 07-09, 2015 Atlanta, USA

Replication competent viral vectors for vaccine development

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Viral infections account for 15 million deaths per year, one-third of all mortalities worldwide. The most effective medical approach to combat viral diseases and reduce deaths is vaccinations, which have less adverse side effects than drugs while inducing longer lasting protection from reinfection. Live attenuated, inactivated, or subunit vaccine approaches have been successfully utilized to combat mortalities caused by infectious diseases such as yellow fever, varicella, measles, mumps, rubella, influenza, smallpox, polio, rabies, hepatitis A and B, and human papillomavirus. Viruses themselves have also been used as vectors (either replication competent or replication deficient) for development of vaccines against both infectious and non-infectious diseases. The most important factor in the construction of effective viral vectors is finding the right balance between safety and immunogenicity. Although live viral vaccine vectors are highly efficacious, there is also a greater potential risk involved with their broader usage because they are replication-competent. Vaccines based on replication-incompetent viruses are perceived to be safer but there is not yet any vaccine on the market for human use. In this talk, characteristics of both replication-deficient and replication-competent viral vectors and barriers for their developments will be discussed. The talk will specifically focus on a few vector examples that have either generated marketed products or have successfully completed their phase 3 efficacy trials.

Biography

Farshad Guirakhoo, a virologist by training, was named one of the 50 Most Influential People in Vaccines in Vaccine Nation's 2014 list. His most recent assignment was CTO at Vaxess Technologies. Prior to this, he served as CSO at Hookipa Biotech and Executive Director of External R&D at Sanofi Pasteur. Before joining Sanofi Pasteur in 2007, he was with Acambis for 15 years as Head of Research and co-invented the ChimeriVax-technology platform in association with St. Louis University. This platform has successfully been applied in the development of vaccines such as IMOJEV™, PreVenile™, Dengvaxia™, and WN human vaccine. He has broad experience in the application of gene expression technologies and molecular virology for the construction and production of recombinant proteins, human antibodies, and attenuated viral vectored vaccines for the prevention and treatment of infectious diseases. He is the Author of over 80 peer-reviewed publications and holder of multiple patents.

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