

7th World Congress on

Virology- Immunology Vaccines

June 18-19, 2026 | New York, USA

Volume: 17

Rapid Vaccine Development Platforms for Emerging Viral Diseases

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Rapid vaccine development has become one of the most important scientific achievements in modern medicine, particularly during global infectious disease emergencies. This presentation discusses innovative vaccine platform technologies that enable accelerated vaccine design, preclinical evaluation, and large-scale manufacturing for emerging viral pathogens. Particular attention will be given to viral vector vaccine platforms, antigen optimization, and strategies that induce durable cellular and humoral immune responses.

The presentation reviews scientific advances that contributed to the successful development of vaccines against SARS-CoV-2 and examines how these technologies can be adapted for future outbreaks involving influenza viruses, coronaviruses, and other emerging pathogens. Recent developments in computational antigen design, systems immunology, and rapid clinical trial methodologies will also be discussed.

Future opportunities include universal vaccine strategies, improved manufacturing infrastructure, and international collaborations that support equitable vaccine access worldwide. Strengthening global preparedness through continued investment in vaccine research remains essential for reducing the impact of future pandemics.

Biography

Sarah Gilbert is a vaccinologist at the University of Oxford, United Kingdom. She is internationally recognized for developing innovative viral vector vaccines and advancing rapid vaccine technologies for emerging infectious diseases. Her research has contributed significantly to global pandemic preparedness and vaccine science.