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## Coronavirus Evolution and Veterinary Vaccine Development

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Coronaviruses circulating in domestic animals and wildlife continue to represent a significant source of emerging infectious diseases with the potential to cross species barriers and infect humans. The COVID-19 pandemic has highlighted the critical importance of understanding coronavirus ecology, evolution, and transmission at the human-animal interface. This presentation explores the molecular evolution of animal coronaviruses, their genetic diversity, and the mechanisms that enable viral adaptation to new hosts. Particular emphasis will be placed on comparative genomic studies that have enhanced our understanding of viral mutation, recombination, and host receptor interactions, all of which contribute to the emergence of novel coronaviruses.

The presentation will discuss the role of veterinary virology in identifying animal reservoirs, monitoring viral circulation, and implementing effective surveillance systems capable of detecting emerging pathogens before widespread transmission occurs. Advances in molecular diagnostics, next-generation sequencing, and phylogenetic analysis have greatly improved the ability to characterize coronavirus variants and understand their evolutionary relationships across different animal species.

Finally, the presentation will examine future directions in coronavirus research, including enhanced genomic surveillance, interdisciplinary collaboration, and international data sharing to improve preparedness against emerging viral threats.

### Biography

Nikolaus Osterrieder is a distinguished veterinary virologist at City University of Hong Kong. His research focuses on coronavirus biology, veterinary vaccine development, emerging zoonotic diseases, and viral evolution. He has made significant contributions to understanding virus-host interactions and developing innovative strategies for the prevention and control of infectious diseases in both animals and humans. He is an internationally recognized researcher and frequently speaks at global conferences on virology, veterinary medicine, and emerging infectious diseases.