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Emerging Viral Diseases, One Health, and Global Biosurveillance

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The increasing frequency of emerging infectious diseases highlights the importance of integrating human, animal, and environmental health under the One Health framework. This presentation explores advances in viral surveillance, structural virology, pathogen evolution, and biosurveillance systems that support the early detection of emerging viral threats. Particular emphasis will be placed on zoonotic viruses, including influenza viruses and coronaviruses, and the factors that facilitate cross-species transmission.

The presentation discusses recent progress in structural biology, genomic surveillance, and international data-sharing initiatives that enable researchers to identify novel viral variants and monitor pathogen evolution in real time. Advances in vaccine development, laboratory diagnostics, and multidisciplinary outbreak investigations are also highlighted as essential components of global preparedness.

The session concludes by emphasizing international collaboration, scientific innovation, and sustainable surveillance networks as critical tools for preventing future pandemics and strengthening global health security.

Biography

George F. Gao is a distinguished virologist at the Chinese Academy of Sciences, China. His research focuses on emerging infectious diseases, structural virology, influenza viruses, and One Health approaches. He has made significant contributions to viral surveillance, vaccine research, and global public health preparedness.