

MD627 994 Seminar in Medical Microbiology
Department of Microbiology, Faculty of Medicine, Khon Kaen University

Title : Viral Diversity and Zoonotic Potential of Viromes in Rodents
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Abstract

Over 60% of emerging and re-emerging infectious diseases are zoonotic diseases, which cause >1 billion illnesses and millions of deaths annually. Over 40% of known mammal species are rodents, which are a significant reservoir for zoonotic viruses, including hantaviruses and arenaviruses. Therefore, characterizing the virome profile in these animals is invaluable for outbreak preparedness, particularly in potential hotspots of mammal diversity.

A comprehensive analysis through metagenomic sequencing of the viral genomes from rodents was conducted. In Guangdong, China, RNA viromes of organs from 194 rodents were discovered in 25 families that carry the potential to infect a variety of hosts, including vertebrates, invertebrates, amoebas, and plants. Among these, 21 viral families were considered high-risk viruses for humans, including hantaviruses, picobirnaviruses, astroviruses, and pestiviruses. The phylogenetic trees of four zoonotic viruses revealed features of novel viral genomes that appeared to fit the evolution to have the potential of transmission to humans. The study conducted in Yunnan Province, China demonstrated that viral diversity and abundance in 124 wild and urban rodents are different across landscapes and human influences. *R. tanezumi* in locations with high anthropogenic disturbances exhibited the highest mammal viral diversity, including porcine bocavirus, hantavirus, cardiovirus, and lyssavirus. Spleen and lung have the highest diversity of viruses at the organ level. Using diverse organ types offers insights into mammal viral diversity, in which the viral compositions vary among different organs depending on the tropism of pathogens.

Due to the global diversity and distribution of rodents, increasing attention to their role in viral diseases is essential. Viral surveillance in rodents will identify more diverse viruses, which is important to better comprehend the complex interactions between rodents, viruses, and their environment and to provide early warning to reduce the risk of zoonotic diseases in the future.

References

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