

Department of Biological Sciences

PhD Open Seminar

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Date & Time: **30th July, 2018 at 10:00 AM**

Venue: **AB-3, 402**

Host miRNA suppresses H5N1 influenza virus replication by targeting host and viral gene

The highly pathogenic avian influenza A virus poses a pandemic threat due to zoonotic transmission to humans. The high degree of genetic changes has evolved the avian influenza A virus in such a way that the virus acquired resistance against various anti-viral drugs and therapeutic antibodies¹⁻². To enhance survival of flu patients, agents/factors controlling the viral replication are urgently needed to reduce death toll during future pandemics. Recently, there has been increasing number of evidences that host encoding miRNA interact with the genome of RNA viruses and inhibit viral replication. Thus, these miRNAs could prove to be a potential candidate for controlling viral replication³. In this graduate study, I will show that expression of cellular miRNA, miR-324-5p was downregulated in host cells after infection with RNA viruses including influenza virus and found that miR-324-5p inhibited H5N1 replication by targeting the subunit of RNA polymerase (PB1), an essential gene of the H5N1 virus required for viral transcription and replication. Additionally, transcriptome analysis revealed that miR-324-5p enhanced the expression of anti-viral genes by targeting CUEDC2, the negative regulator of anti-viral immune pathway. Altogether, these findings highlights that the miR-324-5p plays a crucial role in host defense against H5N1 by targeting viral PB1 and host CUEDC2 to inhibit H5N1 replication⁴.

References:

- 1 Jacob, A. *et al.* Amantadine resistance among highly pathogenic avian influenza viruses (H5N1) isolated from India. *Microbial Pathogenesis* **91**, 35-40 (2016).
- 2 Maurer-Stroh, S. *et al.* Potential Human Adaptation Mutation of Influenza A(H5N1) Virus, Canada. *Emerging Infectious Diseases* **20**, 1580-1582 (2014).
- 3 Song, L., Liu, H., Gao, S., Jiang, W. & Huang, W. Cellular MicroRNAs Inhibit Replication of the H1N1 Influenza A Virus in Infected Cells. *Journal of Virology* **84**, 8849-8860 (2010).
- 4 Kumar, A. *et al.* MicroRNA miR-324-5p suppresses H5N1 virus replication by targeting the viral PB1 and host CUEDC2. *Journal of Virology* (Accepted).