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PhD Dissertation Defense

Entitled

The Host miR-17-92 Cluster Negatively Regulates MMTV Replication by Targeting its Genomic RNA via miR-92a

by

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Date & Venue

4:00 pm

Tuesday, 13 December 2022

Location: Yannah Theater, Second Floor, Block C (2C010), Male Side, CMHS

Online

Join with ZOOM or 849 3284 6226

Abstract

The mouse mammary tumor virus (MMTV) is a milk-borne infectious agent capable of inducing mammary tumors in mice. While MMTV has typically been employed to investigate fundamental processes in breast cancer initiation and progression, very little is known about the virus-host interplay during this process. MicroRNAs (miRNAs) are renowned master regulators of the transcriptome that influence key cellular activities, including anti-viral pathways that combat incoming viral infections. A recent study from our group revealed that MMTV does not encode virally-encoded miRNAs (v-miRs); rather, it perturbs the expression of the host miR-17-92 cluster (also known as oncomiR-1) often seen to be dysregulated in cancers. These findings prompted us to investigate the role of miR-17-92 cluster during MMTV replication. Our work identifies a novel anti-viral role of the miR-17-92 cluster in MMTV replication where it adversely affects the translation and packaging of full-length MMTV genomic RNA, thereby drastically suppressing its replication. Furthermore, we identified miR-92a as effectively being the predominant anti-viral component of the miR-17-92 cluster directly targeting the *gag* region of the genomic RNA. Thus, our analysis provides the first evidence demonstrating the biological influence of host miRNAs in controlling MMTV replication.

Keywords: Mouse mammary tumor virus (MMTV); Non-coding RNAs; RNA interference; miRNAs; miR-17-92 cluster; OncomiR-1; miR-92a; anti-viral miRNAs; host-virus interactions.