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Does viral persistence shape virus–virus interactions in mosquitoes?

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Mosquitoes host a wide diversity of insect-specific viruses alongside medically important arboviruses. While insect-specific viruses have been proposed as potential modulators of arbovirus transmission, the mechanisms underlying these interactions remain poorly understood, particularly in the context of persistent infections (long-term infection without clearance) that characterise most mosquito–virus associations.

Here, we investigated interactions between insect-specific alphaviruses and arboviruses in mosquito cell lines. Insect-specific alphaviruses reduced the replication of related arboviruses, especially when they were persistently infecting cells. No strong interference was detected in sequential or simultaneous co-infection settings. To explore potential underlying mechanisms, we compared acute and persistent insect-specific virus infections. Differences were observed at multiple levels, including changes in host transcriptomic profiles and microRNA expression. In addition, small RNA sequencing revealed antiviral RNAi responses targeting ISVs, with differences between acute and persistent conditions.

Overall, our results indicate differences in host responses associated with persistent insect-specific virus infections, which may influence subsequent arbovirus infections. Further work will be needed to determine how these responses contribute to interference phenotypes and whether they can be leveraged to better understand or modulate arbovirus transmission.

Keywords

arbovirus, insect-specific virus, vector control, vector immunity

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Professional Status of the Speaker

Senior Scientist

Junior Scientist Status

No, I am not a Junior Scientist.

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