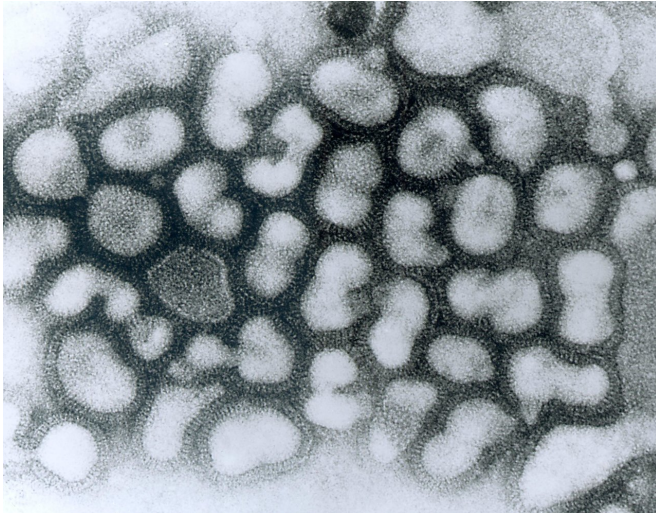


Expression of M gene segment of influenza A virus determines host range

15 August 2019



Transmission electron micrograph of influenza A virus, late passage. Credit: CDC

The host range of the influenza A virus (IAV) is restricted by dysregulated expression of the M viral gene segment, according to a study published August 15 in the open-access journal *PLOS Pathogens* by Anice Lowen and John Steel of Emory University School of Medicine, and colleagues.

IAV pandemics arise when a [virus](#) adapted to a non-human host overcomes species barriers to successfully infect humans and sustain human-to-human transmission. To gauge the adaptive potential and therefore pandemic risk posed by a particular IAV, it is critical to understand the mechanisms underlying viral adaptation to human hosts. To address this question, Lowen and Steel examined the role of one of IAV's eight [gene segments](#), the M segment, in host adaptation. The authors compared the growth of IAVs with avian- and human-derived M segments in avian and mammalian systems.

The avian, but not the human, M segment restricted viral growth and transmission specifically in mammalian cells. This host-specific restricted growth was associated with excess production of the M2 protein resulting from transcription of the avian IAV M segment in [mammalian cells](#). Excess production of the M2 protein interfered with cellular functions on which the virus relies. The results suggest that control of M segment gene expression is a critical aspect of IAV host adaptation. According to the authors, the findings could lead to the development of effective strategies for monitoring IAV pandemic risk.

The authors add, "The results reveal that careful regulation of viral gene expression is achieved through species-specific interactions with the [host cell](#), and thereby point to this aspect of the viral life cycle as a restriction on [avian influenza A virus](#) emergence in humans."

More information: Brenda M. Calderon et al, Dysregulation of M segment gene expression contributes to influenza A virus host restriction, *PLOS Pathogens* (2019). [DOI: 10.1371/journal.ppat.1007892](#)

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