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Abstract

Coxsackieviruses Undergo Intercellular Transmission as Pools of Sibling Viral Genomes Associated to Membranes †

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† Presented at Viruses 2020—Novel Concepts in Virology, Barcelona, Spain, 5–7 February 2020.

Published: 4 July 2020

Abstract: Some viruses are released from cells as pools of membrane-associated virions. By increasing the multiplicity of infection, this type of collective dispersal could favor viral cooperation, but also the emergence of cheater-like viruses, such as defective interfering particles. To better understand this process, we examined the genetic diversity of membrane-associated coxsackievirus infectious units. We found that infected cells released large membranous structures containing 8–21 infectious particles on average, including vesicles. However, in most cases (62–93%), these structures did not promote the co-transmission of different viral genetic variants present in a cell. Furthermore, collective dispersal had no effect on viral population sequence diversity. Our results indicate that membrane-associated collective infectious units typically contain viral particles derived from the same parental genome. Hence, if cooperation occurred, it should probably involve sibling viral particles rather than different variants. As shown by social evolution theory, cooperation among siblings should be robust against cheater invasion.

Keywords: enterovirus; viral transmission; collective infectious unit; extracellular vesicles; social evolution