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ORAL ABSTRACT PRESENTATIONS

SESSION TITLE: STRUCTURE OF VIRUSES AND CHAPERONINS

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Abstract OR-7: Genome Release Mechanism of Picorna-Like Viruses

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Protein capsids protect the genomes of viruses from degradation in the extracellular environment. However, virus capsids must release genomes into a host cell to initiate infection. We used cryo-electron microscopy to characterize the genome release of viruses from the order Picornavirales: picornaviruses, dicistroviruses, and iflaviruses. These virus families include numerous human and animal pathogens. The viruses have non-enveloped virions and capsids organized with icosahedral symmetry. Their genome release can be induced in vitro by exposure to acidic pH, mimicking conditions in endosomes. We show that conformational changes of capsids and expansion of viral RNA genomes, which are induced by acidic pH, trigger the opening of picorna-like virus particles. The capsids of the studied viruses crack into pieces or open like flowers to release their genomes. The large openings of capsids enable the virus genomes to exit within microseconds, which limits the probability of their degradation by the RNases. Characterization of the virus genome release is the first step towards developing inhibitors of the process.

Key Words: cryo-EM • virus • genome • release

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