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ORAL ABSTRACT PRESENTATIONS

SESSION TITLE: STRUCTURE OF VIRUSES AND CHAPERONINS

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Abstract OR-10: The Structure of Human Echovirus 30

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Background: Human Echovirus 30 (E30) is one of the most frequently isolated Enteroviruses in temperate climates. E30 affects the central nervous system, causing aseptic meningitis, encephalitis in newborns and immunocompromised hosts. Last year EU/EEA public health institutes observed an upsurge in the number of positive enterovirus detections, including E30 cases. The strain - E30 Bastianni shows distinct infection progress. It infects epithelial cells of human choroid plexus leading to alteration of its barrier function. The virus is able to disrupt the contacts between the brain choroid plexus cells and can rapidly replicate and transmit among the host cells.

Method: We solved the structure of E30 strain Bastianni virion with the resolution of 3,5 Å.

Results: The particle is built from three major capsid proteins VP1-VP3 and genome, packed inside of the capsid. The VP4 – minor capsid protein was not detected and the 54 residues of N-terminus of the VP1 subunit also lack on the electron density map. Such organization of a capsid is typical for the A-particle - the genome release intermediate state. Together with the A-particle, virions missing one pentamer were detected. Similar particles were observed for Echovirus 18. This discovery enabled to propose a novel genome release mechanism for enteroviruses, where opening of the capsid with the release of one or few pentamers enables genome release without the need to unwind its putative double-stranded RNA segments.

Conclusion: Obtaining detailed information about both the structure and the infection process of the Echovirus 30 may facilitate the development of new antiviral compounds and prevent its outbreaks worldwide.

Key Words: CryoTEM • Single-particle reconstruction • Picornavirus infections

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