



ID der Kurzfassung : 495

Isolation of infectious Hepatitis E virus from wastewater treatment plants and its methodological challenges

Inhalt

Hepatitis E virus (HEV) is a One Health pathogen causing acute hepatitis, severe disease in vulnerable patients, and chronic infection in immunocompromised individuals. While zoonotic transmission is established, environmental HEV spread remains poorly understood. We investigated urban wastewater treatment plants to recover infectious HEV and address methodological barriers of this sample matrix.

Wastewater was sampled at sedimentation, after approximately 50% and 100% of biological treatment, and from the effluent. After ultracentrifugation-based pelleting, HEV RNA was detected by qPCR in one of four sampling events. Despite low viral loads in pellets (Ct 36–38), infectious virus was isolated on PLC/PRF/5 cells. Infectivity persisted after storage at 4°C for 5 weeks. Sequencing and phylogenetic analysis identified HEV subtype 3e.

These results demonstrate the sensitivity of the cell culture system, but also highlight critical challenges: large sample volumes, dilution, PCR inhibitors, microbial contamination, preservation of infectivity, and pellet-recovery controls. Detecting infectious HEV in wastewater is highly relevant, as it provides direct evidence for environmental persistence beyond RNA detection and supports risk assessment and surveillance at the human-animal-environment interface.

Keywords

Hepatitis E virus, environmental transmission, zoonosis

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Professional Status of the Speaker

Postdoc

Junior Scientist Status

No, I am not a Junior Scientist.

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