

# Professor publishes study on detection of human noroviruses

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Coastal water is subjected to contamination with a wide range of pathogenic microorganisms, which presents a major health risk to recreational water users. The current use of fecal indicator bacteria (FIB) as an indicator for water quality monitoring has its limitations for swimmer protection. These fecal bacteria are known to persist and grow in the environments, which bias assessment, especially in tropical regions like Hawai'i. While there is a lack direct link between FIB and human diseases since FIB are not human pathogens, enteric viruses are being considered as an alternative indicator because they are the main cause of water-borne gastroenteritis and they are free of environmental multiplication. However, the nature of extremely low copy number of enteric viral pathogens in water has been a challenging factor for their use as a valid bioindicator.

To address this challenge, Dr. Yuanan Lu, professor of epidemiology and environmental health at UH Mānoa, recently published a paper in *Water Research* titled, "Effective detection of human noroviruses in Hawaiian waters using enhanced RT-PCR methods." The study is aimed at the establishment of highly effective laboratory methods for viral concentration from environmental water and also highly sensitive laboratory protocols for enhanced viral detection and health risk assessment. In particular, human norovirus is tested in this study as a model enteric virus since noroviral infection represents the leading cause of non-bacterial gastroenteritis and has become an increasing public health problem worldwide.

Lu and fellow researchers established highly sensitive RT-PCR protocols for enhanced detection of human noroviruses in environmental waters through a comprehensive test and comparative analysis. These newly established highly sensitive and specific viral detection protocols will be extremely valuable and useful for all environmental microbiologists interested in recreational water quality monitoring and enteric virus detection in the future.

This study represents the first report of detecting human noroviruses in O‘ahu recreational and coastal waters, suggesting a possible occurrence of human sewage contamination of these water sites. Although it is unknown if the positive viral detection is associated with infectious noroviruses since no laboratory method is currently available to test noroviral infectivity, future surveillance of enteric virus contamination on these viral positive sites is strongly recommended to ensure a safe use of recreational waters.

Findings from this study also support the notion of possible use of enteric viral pathogens for environmental [water](#) monitoring and argue that importance and essentiality for such monitoring activity to ensure safe use of recreational waters.

Provided by University of Hawaii at Manoa

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