Performance Evaluation of Puritan Unitranz-RT Universal Transport System for the Detection of Respiratory Viruses

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Methods Overview

Seven ten-fold dilutions (10⁻¹, 10⁻², 10⁻³, 10⁻⁴, 10⁻⁵, 10⁻⁶, and 10⁻⁷) of stock Influenza A (A/California/04/2009(H1N1)) and Adenovirus were prepared. Eight ten-fold dilutions were prepared for Rhinovirus. The titers of the viruses were 1X10⁴, 1X10⁵, and 1X10⁶ TCID₅₀ respectively. Samples were extracted and then evaluated using the ABI 7500 Real-Time PCR system.

Results

For each virus, we found that there was a statistical difference between CT values for samples applied to swabs and samples processed directly from stock. Our results indicate that storage in Puritan Unitranz-RT is advantageous for qRT-PCR detection when compared to samples not stored in Puritan Unitranz-RT.

Conclusions

These results indicate that prolonged storage in Puritan Unitranz-RT does not have a negative effect on virus detection. Future work will consider qRT-PCR for the detection of additional influenza and respiratory viruses.

Methods

Serial Dilutions

Spike samples with virus

Extraction

qRT-PCR

Discussion

We found that there was a significant difference between samples stored in Puritan Unitranz-RT and those stored in cell culture media. On average, the samples stored in Puritan Unitranz yielded a lower CT value at each dilution. At lower concentrations, a CT value was able to be detected for viruses stored in Puritan Unitranz more often than those stored in cell culture media. These results indicate that Puritan Unitranz-RT supports the virus in a way that allows it to be detected at lower concentrations over a longer period of time. Out of the three viruses, Puritan Unitranz-RT seems to be most advantageous for storing and transporting Adenoviruses for detection by qRT-PCR. There was a significant statistical difference for the number of Adenovirus samples that were detected by qRT-PCR and that were reported as negative when compared to samples stored in cell culture media. However, p=0.0196 at the 10⁻¹ dilution, p=0.0382 at the 10⁻³ dilution, and p=0.0280 at the 10⁻⁴ dilution. Based on conventional criteria, this difference is considered to be statistically significant. Additional testing and increasing the sample size will provide a more accurate determination.

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