Development of Rabbitpox Virus and Cowpox Virus Real-Time PCR Assays

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Abstract

Background: Visceral virus is a prevalent threat in research due to its ease of manipulation via visit vectors or reconstituted vectors. The virus is particularly advantageous because it can be readily stored, propagated on a wide array of hosts, and is a common laboratory strain of Orthopoxviruses.

Methods: The Rabbitpox virus assay was designed based on whole-genome multiple alignment of seven Orthopoxviruses, including Cowpox virus. The assay was validated for use on one of the laboratory strains of Cowpox virus, in addition to a novel strain of Cowpox virus. The assay was also performed on a range of Orthopoxvirus targets, including Vaccinia virus, Western Reserve, and Zaire 79. The assay was validated with Positive and Negative Controls, and Positive and Negative Contamination Controls.

Results: The assay was shown to have high specificity and sensitivity for detection of the Cowpox virus genome. The assay was successfully used to detect the Cowpox virus genome in cell cultures and in clinical samples.

Conclusions: The assay developed for the detection of Cowpox virus is a useful tool for research, allowing for the rapid and accurate detection of the virus in a laboratory setting. The assay has been successfully validated for use in a range of Orthopoxvirus targets, including Vaccinia virus, Western Reserve, and Zaire 79. The assay is a valuable tool for research and laboratory settings.

Introduction

The pathogenic history of Rabbitpox virus began when it was recognized that the cloned smallpox vaccine strain, Cowpox virus, was replaced by the smallpox virus in laboratory environments. Since then, rabbitpoxvirus have been extensively used in the laboratory, with applications in vaccine development and gene editing.

Materials and Methods

The real-time quantitative polymerase chain reaction (qPCR) assay specific for Rabbitpox virus was designed based on whole-genome multiple alignment of seven Orthopoxviruses, including Cowpox virus. The assay was validated for use on one of the laboratory strains of Cowpox virus, in addition to a novel strain of Cowpox virus. The assay was also performed on a range of Orthopoxvirus targets, including Vaccinia virus, Western Reserve, and Zaire 79. The assay was validated with Positive and Negative Controls, and Positive and Negative Contamination Controls.

The specificity of the assay was confirmed using Positive and Negative Controls, and Positive and Negative Contamination Controls.

References & Acknowledgements


Conclusions: The possibility of Rabbitpox virus strains in research requires a sensitive method to detect virus-negative controls to ensure the integrity of experiments. This study demonstrates the development of a novel Rabbitpox virus qPCR assay and the adaptation of a Cowpox virus qPCR assay that has already proved useful within the BEI Resources Collection. The Cowpox virus qPCR assay was used to detect two different strains within the oviruses species (Cowpox virus and Rabbitpox virus).