

OMNIGENE®•ORAL (OM-505) stabilizes RNA from human viruses at room temperature for several weeks

OMNIGENE®•ORAL (OM-505) is designed to collect and stabilize microbial DNA and RNA from saliva. In this white paper, we demonstrate that OMNIGENE•ORAL stabilizes the RNA from a human virus for up to 21 days at room temperature.

Introduction

The successful and accurate detection of viruses and bacteria by molecular techniques greatly depends on the quality of the sample. Poorly preserved samples may provide misleading results including false negatives or false positives, can negatively impact the treatment of patients, mislead the interpretation of the effect of medication (antibiotics and antiviral drugs) or can skew the results of epidemiology studies.

In addition to the clinical relevance of sample quality and stability, the study of microorganisms using molecular detection methods requires that the sample resemble an “in vivo” state. Poorly stabilized samples can impact the results in several ways, including:

- a selective overgrowth of a subset of microorganisms,
- the formation of spores,
- the destruction of viruses, and
- the chemical and enzymatic degradation of nucleic acids (RNA in particular).

Current strategies to mitigate these stability challenges include storing and transporting samples at low temperatures, fast turn-around time during processing and drying the samples over solid matrix (i.e., paper). These strategies are expensive, impractical and in some cases inefficient.

OMNIGENE•ORAL is an all-in-one system for the collection and stabilization of microbial DNA and RNA from saliva. The kit enables long-term stability of nucleic acids at ambient temperature. The collection method allows for the painless and non-invasive collection of high quality samples that facilitates nucleic acid detection from DNA and RNA viruses and bacteria with broadly used molecular methods/instruments (e.g., RT-qPCR, Abbott *m2000rt* instrument).

This technical bulletin describes the stability of a human RNA virus in saliva samples collected with the OMNIGENE•ORAL kit. Samples spiked with Human Immunodeficiency Virus -1 were used for the detection of viral RNA using the Abbott *m2000rt* RealTime System. The Abbott *m2000rt* instrument is a broadly used device for the detection of RNA viruses in research and clinical settings. This instrument is recognized for its accuracy and efficient workflow.

Material and methods

Saliva samples were collected with OMNIGENE•ORAL as per the kit instructions. The samples were spiked with a known amount of HIV virus in plasma (low copy, 2.7 LOG [IU/mL]; medium 3.4 LOG [IU/mL] and high copy, 4.1 LOG [IU/mL]). These samples were briefly mixed and were processed immediately or after 21 days incubation at room temperature (20°C to 25°C). All samples were processed in triplicate with the Abbott *m2000rt* RealTime System for the detection of HIV.

Results

OMNIgene•ORAL/saliva samples spiked with HIV virus (low, medium and high viral loads) were processed with the Abbott *m2000rt* RealTime System. Quantitative results showed equivalent amounts of RNA between OMNIgene•ORAL/saliva samples and the corresponding controls at both time points (Figure 1). This result indicates that saliva samples collected with OMNIgene•ORAL can be reliably used for the detection of viral RNA using the Abbott *m2000rt* RealTime System.

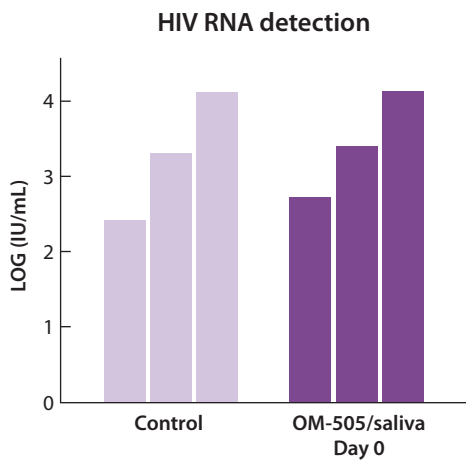


Figure 1: Detection of RNA from HIV-1 immediately after collection using Abbott *m2000rt* instrument. No difference was observed between the control samples. Left – spiked control samples; right – spiked OMNIgene•ORAL/saliva samples.

OMNIgene•ORAL/saliva spiked samples were stored at room temperature for 21 days and processed as previously described. No differences in the HIV viral RNA quantification were observed between the samples processed immediately after collection or after 21 days. (Figure 2). These results indicate that viral RNA in saliva samples collected with OMNIgene•ORAL is stable for up to 3 weeks at room temperature.

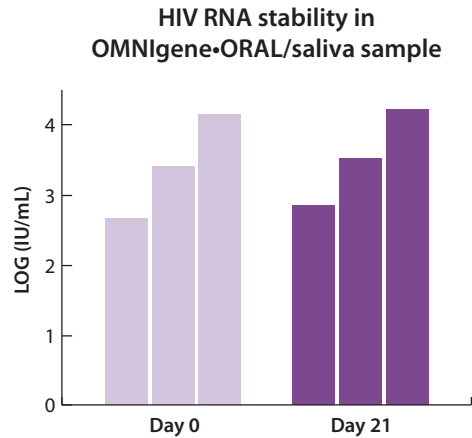


Figure 2: Detection of viral RNA from OMNIgene•ORAL/saliva samples using Abbott *m2000rt* instrument. Samples were spiked using known amounts HIV virus. No differences were observed between day 0 (low copy 2.7 ± 0.04 LOG [IU/mL]; medium 3.4 ± 0.02, LOG [IU/mL] and high copy, 4.1 ± 0.02 LOG [IU/mL]) and day 21 (low copy 2.7 ± 0.05 LOG [IU/mL]; medium 3.4 ± 0.0, LOG [IU/mL] and high copy, 4.2 ± 0.05 LOG [IU/mL]). Spiked OMNIgene•ORAL/saliva samples processed immediately (left) or after 21 days at room temperature (right).

Conclusions

OMNIgene•ORAL stabilizes viral RNA from human RNA viruses for up to 21 days at room temperature. Saliva collected with OMNIgene•ORAL is fully compatible with the Abbott *m2000rt* RealTime System for the detection of RNA from human viruses.

Some DNA Genetek products may not be available in all geographic regions.

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