

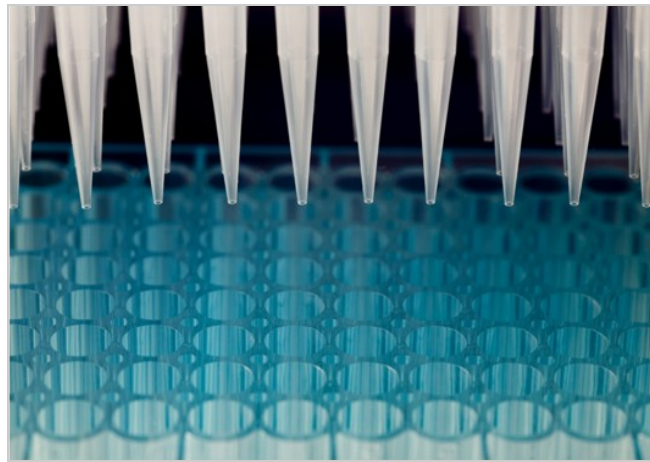
Oregon Health Science University

A TruTip™ Case Study



“In our lab, we see patient samples that need to be processed quickly for clinical diagnosis. I am always searching for faster, more efficient methods to validate so that we can more rapidly help our patients.”

PTRL, Method Development Scientist



Customer:

OHSU Pathology Translational Laboratory (PTRL)

Application:

RNA Extraction from Influenza and RSV

Challenge:

To save time extracting RNA from individual patient nasopharyngeal samples while allowing for equivalent yield to gold standard methods.

Solution:

TruTip Influenza RNA Extraction Kit

Oregon Health Science University (OHSU) is the place where patients reap the benefits of world-class knowledge for complex yet common health care needs. Each year, OHSU serves approximately 700,000 patients from the state of Oregon and surrounding states. Within OHSU, the PTRL is where methods are developed to process infectious disease samples in a clinical setting. In an effort to keep its leadership edge, the laboratory services at OHSU had been in search of a more efficient, high-throughput method for extracting viral RNA.

Customer Profile

Akonni[®]
Biosystems

Introduction

The isolation and purification of nucleic acid are the first steps in any diagnostic or genetic-based test and are commonly used by a wide variety of clinical laboratories. These first steps have traditionally consumed countless hours of staff time and lab materials. The PTRL at Oregon Health & Science University (OHSU) needed a more efficient method for extracting viral RNA to be able to minimize sample processing time.

The Speed Challenge

Automating the extraction procedure offers time savings for labs looking to process a moderate to high number of samples. As testing began on TruTip with the Eppendorf epMotion, its superior speed and usability quickly became apparent. OHSU compared the gold standard magnetic bead extraction with the Akonni TruTip and found that TruTip provides a 2-fold improvement in speed for 8 to 96 samples allowing for double the productivity in sample processing in a single day. Graphs in Figures 1 & 2 show the performance gains observed.

“Our goal is to find a more efficient method for extracting viral RNA. Efficient to us means that it is faster and delivers an equivalent or better yield.”

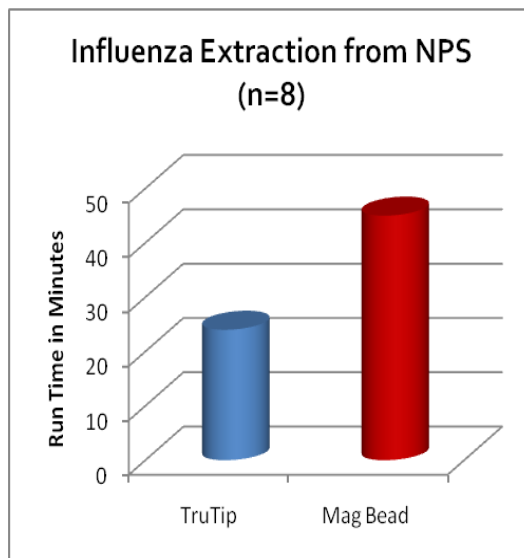
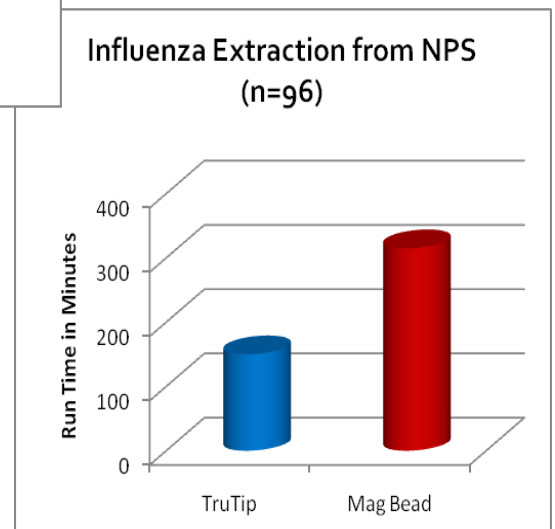


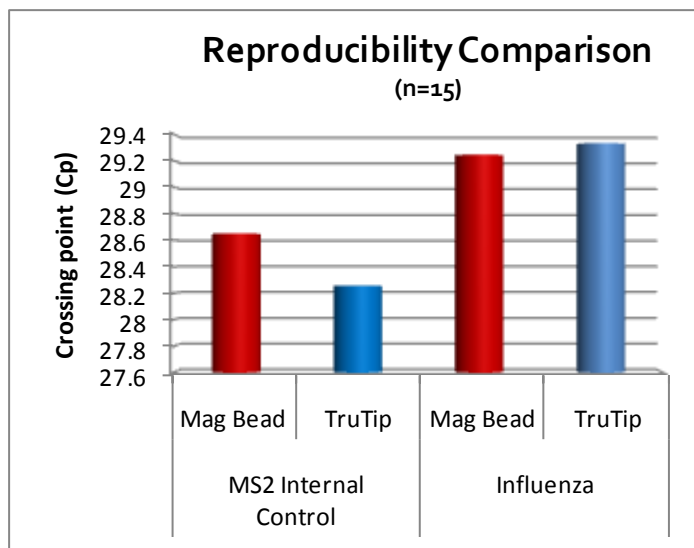
Figure 1,2. Comparison of run times for TruTip vs. gold standard using different size batches.



The Yield Challenge

OHSU performed side-by-side extractions to challenge TruTip's purification capabilities against their typical gold standard magnetic bead method. Extracted influenza A and hRSV RNA from nasopharyngeal swab samples (NPS) in Universal Transport Medium (UTM) was detected using the Roche Light Cycler 480 real-time instrument. Results demonstrated equivalence as shown in Figure 3. A second experiment was completed to test for equivalent sensitivity.

Figure 3 (below). Comparison of automated systems in the replicate extraction of identical influenza and MS2 internal controls for NPS samples in UTM. Results show equivalent and reproducible yields between the two systems.



Specifically, side-by-side extractions were performed from three sets of dilution series, made from positive influenza A, B, and hRSV samples. Results indicate that TruTip and the gold standard magnetic bead method were equivalent (representative results shown in Figure 4).



Eppendorf epMotion automated pipetting system

“As flu season approaches, the flexibility of being able to run samples with such speed and efficiently will enable me to obtain results the same day I begin processing the samples, even as sample volumes go beyond what can be completed during a single run on the Roche system.”

**Method Development
Scientist, PTRL**

"As for ease of setup and process speed, TruTip is superior to the magnetic bead system when automated on the epMotion®."

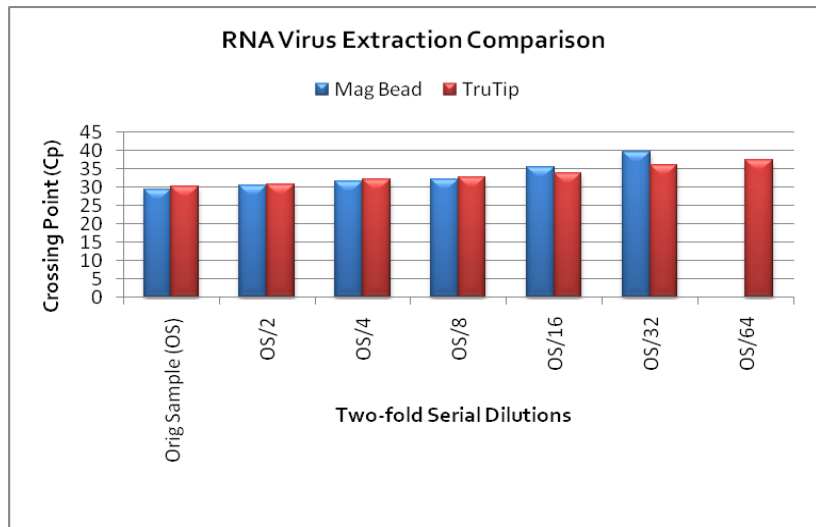


Figure 4. Dilution series of human respiratory syncytial virus (hRSV) in UTM. Extraction comparison between TruTip/epMotion 5075 and Magnetic Bead automated systems.

Conclusion:

TruTip's ability to reproducibly process samples with superior speed and without any loss in sensitivity as compared to the gold standard extraction method was proven. In addition, automation on the epMotion 5075 enables higher throughput and the flexibility to process from one to 96 samples in a single run. In comparison, extractions on similarly priced instruments may require multiple batch runs and longer processing times to meet the same output. Now the PTRL Lab is able to efficiently process patient samples while supporting more rapid patient diagnosis and point-of-care.

About Akonni Biosystems

Akonni Biosystems was founded in 2004 and has over 20 patents issued with 13 others pending. Our core technology is based on work developed at Argonne National Laboratory and the Engelhart Institute of Molecular Biology, and utilizes gel-drop array technologies optimized for medical applications. We have also developed core IP in the area of ultra-rapid nucleic acid extraction. Supported by a series of government grants and contracts from NIH, CDC, DOE, NIH and NSF, we have significantly advanced the original microarray technology by improving the system's capabilities from sample preparation to final result. Commercial products and those in our near-term pipeline include TruTip rapid sample preparation kits for extraction of Influenza RNA from NPS and genomic DNA from saliva or blood, TruArray® multiplex assays for detecting multidrug-resistant tuberculosis (MDR-TB), upper respiratory infections, viral encephalitis, and hospital-acquired infections (MRSA) and TruDx® microarray imagers.