TANBead Pathogen Extraction kits

I. Introduction

Pathogens are organisms such as virus, bacterium, protozoan, viroid, or fungus that cause infections in individuals by avoiding host defense mechanisms leading the appearance of disease symptoms. To date, the classical way to diagnose the pathogen and disease rely on symptoms description and later on pathogen culture. This process takes time, and the risk of wrong diagnostic is high. Nowadays, molecular techniques enable fast and accurate diagnostic, and the early and precise determination of pathogen by isolating its DNA or RNA led to better patient support and treatment.
TANBead Viral/Pathogen extraction kits are designed to recover RNA and DNA from viruses, both gram-positive and gram-negative bacteria, fungus, and protozoan samples such as blood, body fluids, swabs, urine, sputum, bronchoalveolar lavage (BAL) and various liquid pathogen preservation medium. With advanced technology, TANBead kits enable to remove proteins, nucleases, contaminators, and inhibitors completely. High-quality nucleic acids extracted from a wide range of sample materials are ready for immediate use in downstream applications, such as PCR-based analysis, Sanger sequencing, next-generation sequencing and infectious disease research.

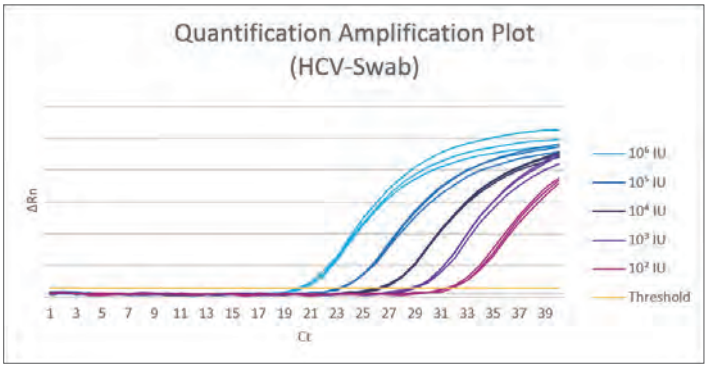
II. Advantages

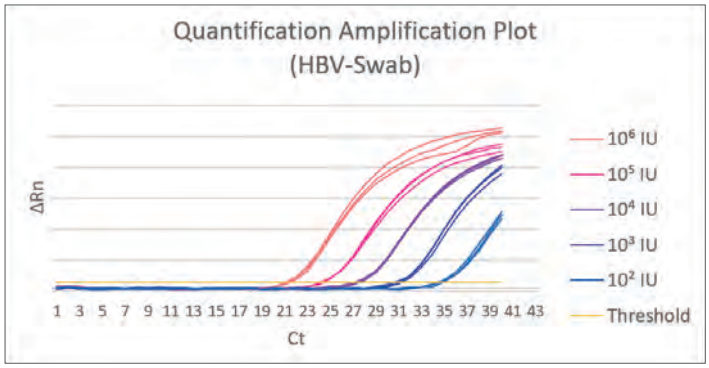
- Provides easy operation from 1 to 96 samples, including higher processing volumes in 40-80 minutes.
- RNA Carrier not required.
- Automation-ready, no organic extraction or ethanol precipitation is required.
- Complete removal of contaminants and inhibitors.

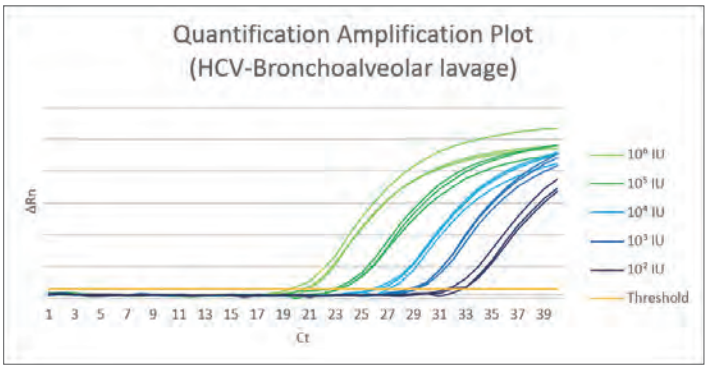
III. Application data

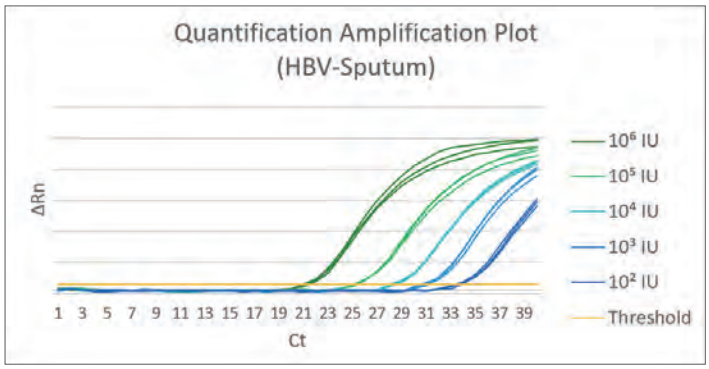
Table1. The various targets and sample types were tested in the TANBead lab.

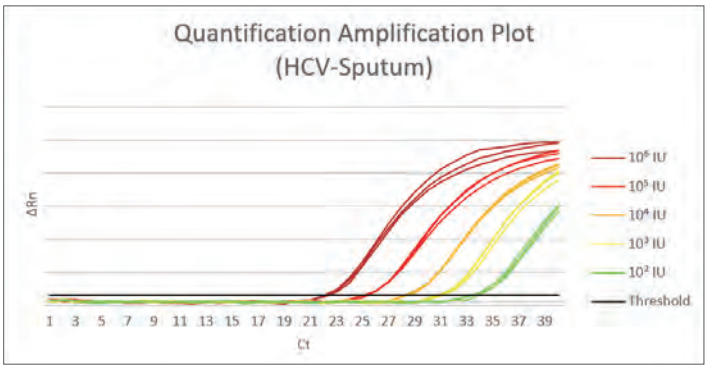
Organism type	Target	Biological samples
ssRNA virus	*Hepatitis C (HCV)*	Blood or other body fluids
	Influenza A	Nasopharyngeal or nasal swab
	Coronavirus	Nasopharyngeal or nasal swab
dsRNA virus	*Trichomonas Vaginalis*	Endocervical, Vaginal samples
dsDNA virus	*Hepatitis B (HBV)*	Blood or other body fluids
	Human Papillomavirus (HPV)	Cervix cells with the brush or swab
Gram-negative	*Neisseria Gonorrhoeae*	Rectal, Urethral, Urine
	Escherichia Coli	A swab and wetting solution
	Salmonella	A swab and wetting solution
	Chlamydia Trachomatis	Endocervical, Urethral, Urine, Vaginal
Gram-positive	*Staphylococcus Aureus*	A swab, cloth, or wetting solution
	Mycoplasma Genitalium	Endocervical, Rectal, Urine, Vaginal
Fungi	Yeast, filamentous fungi	-











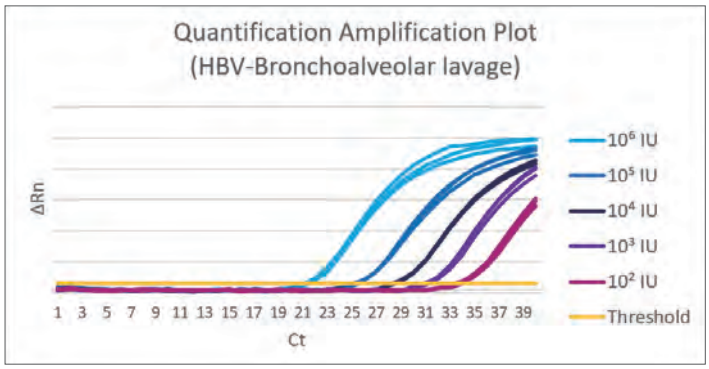
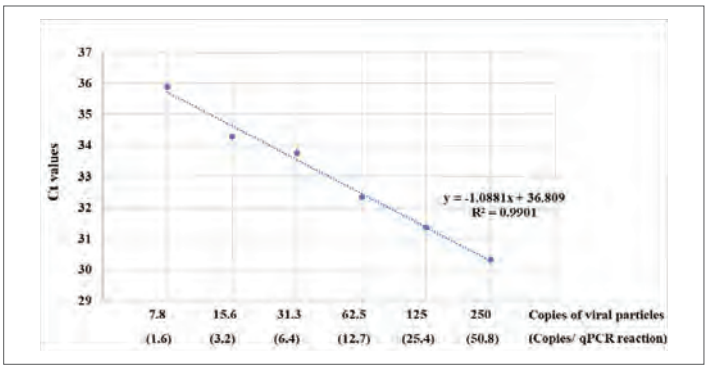


Figure 1. Various concentrations of HCV RNA from Swab, Sputum and Bronchoalveolar lavage using TANBead viral extraction kit were tested in Real-time PCR on Bio-Rad CFX-96 system (in Triplicate s for each concentration).

Figure 2. Various concentrations of HBV RNA from Swab, Sputum and Bronchoalveolar lavage using TANBead viral extraction kit were tested in Real-time PCR on Bio-Rad CFX-96 system (in Triplicate for each concentration).



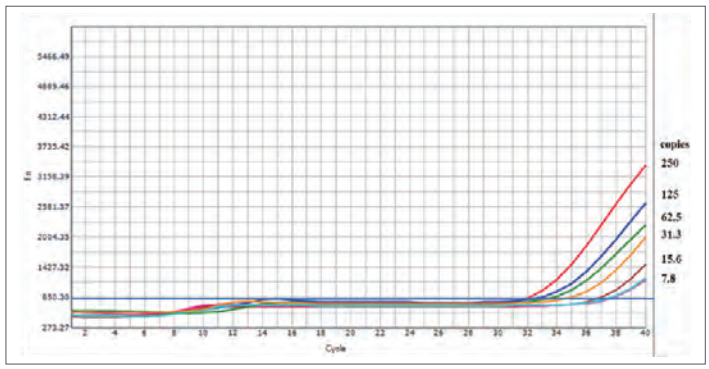


Figure 3. AccuPlex™ SARS-CoV-2 RNA particles diluted by two-fold serial dilution from 250 to 7.8 copies number show consistent Ct values for 20 replicates and accurate quantitation down 7.8 copies by real-time PCR system (20 replicates for each concentration, 19/20 positive sample at 7.8 copies, and 20/20 at other concentrations).

Table2. The quantification and qualification of E. coli and Salmonella DNA genomic were extracted by TANBead Gram Bacteria kit

Instrument	Sample for 8 tests ($4x10^8$ cells/ml)	DNA concentration (ng/µl)	A260/A280	A260/A230
Maelstrom 8	*E. coli*	14.9±0.49	2.01±0.03	1.74±0.04
	Salmonella	21.1±0.97	2.01±0.02	1.68±0.02
Maelstrom 4800	*E. coli*	14.75±0.22	2.02±0.05	1.93±0.05
	Salmonella	18.1±0.49	2.00±0.05	1.91±0.03

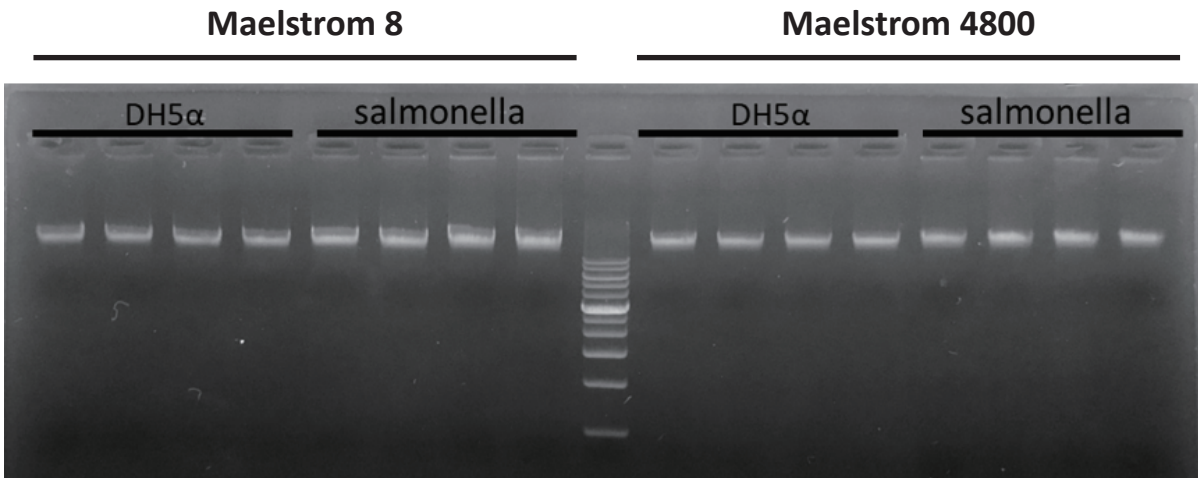


Figure 4. 1% Agarose gel analysis of genomic DNA isolated from the indicated Gram-negative bacteria prepared using TANBead Gram bacteria DNA extraction kit (Four replicates for each sample).

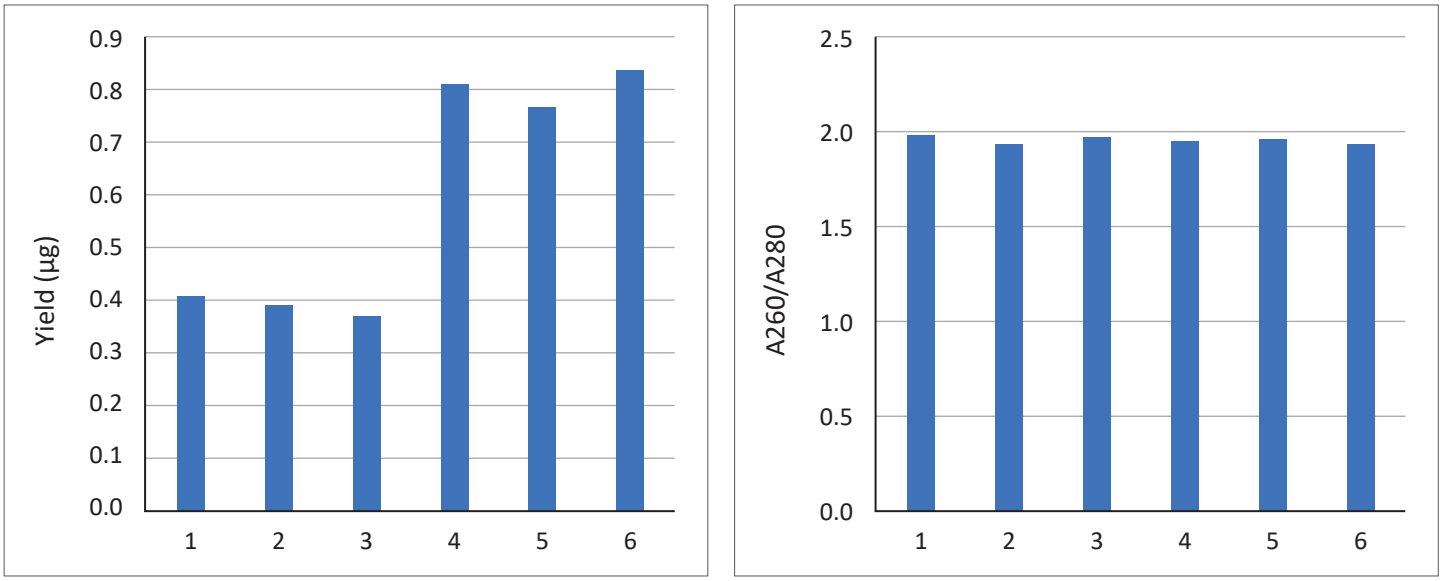


Figure 5. Quantification of DNA concentration and 260/280 ratio purified from 1 OD and 2 OD yeast by using TANBead Fungi DNA extraction Kit.

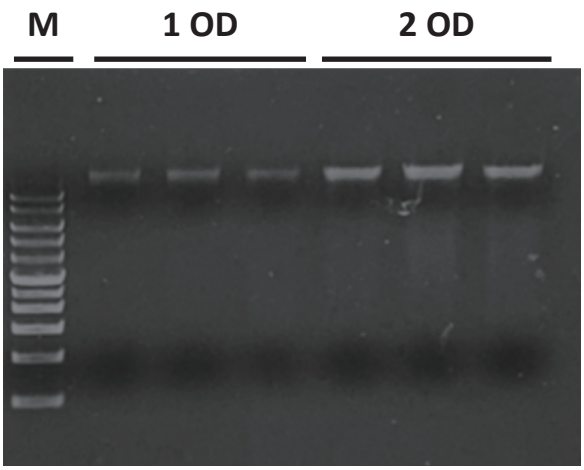


Figure 6. 1% Agarose gel analysis of genomic DNA isolated from 1 OD and 2 OD yeast by using TANBead Fungi DNA extraction kit (Three replicates for each sample).

IV. Specifications

Target	Instrument model	M8	M4800	M9600	SLA 32	SLA E13200
Virus	Input sample	At least 10 copies				
	Elution volume (µl)	80-100 µl				
	Preparation time	40 mins/ 8 samples	40 mins/ 48 samples	45 mins/ 96 samples	45 mins/32 samples	
	Application	PCR-based analysis				
Bacteria	Input sample	≤ 10^8 cells				
	Elution volume (µl)	100-130 µl				
	Preparation time	60 mins/ 8 samples	60 mins/ 48 samples	90 mins/ 96 samples	80 mins/32 samples	
	Application	PCR-based analysis, Sanger sequencing and next-generation sequencing				
Fungi	Input sample	At least 1.5 O.D.				
	Elution volume (µl)	130 µl				
	Preparation time	40 mins/ 8 samples	40 mins/ 48 samples	-	80 mins/32 samples	
	Application	PCR-based analysis, DNA array				

V. Conclusion

The optimized magnetic beads and reagents make TANBead Pathogen nucleic acid extraction kits the ideal laboratory tool to recover RNA and DNA present at low concentrations in body fluids or various liquid pathogen preservation media with high-yield and high suitable for many downstream applications.

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