NANOTRAP® VIRUS CAPTURE KIT

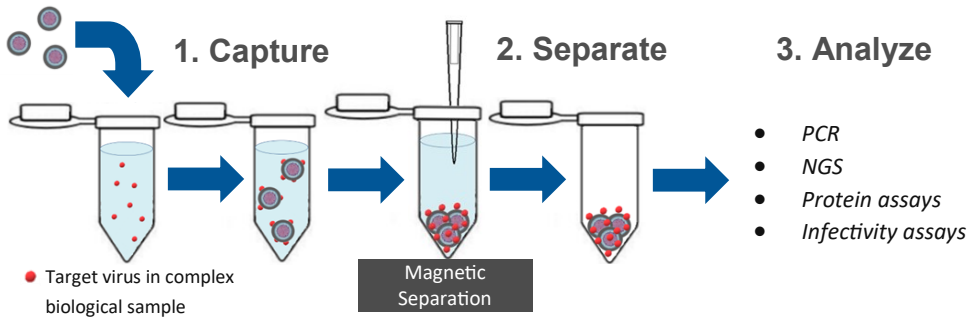
Get More from Your Samples

Knowing a virus is present in a sample and not being able to detect it is frustrating. Use the Nanotrap® Virus Capture Kit to concentrate viruses from complex biological matrices in order to have high quality input material for your downstream analytical methods.

- ***Compatible with nucleic acid assays, protein assays, and infectivity assays***
- ***Increase sensitivity and improve nucleic acid yield***
- ***Simplify processing for large volume samples***
- ***Choose your own nucleic acid extraction kit***
- ***Improve existing sample preparation workflows with easy integration***

Minimal Effort for Maximum Efficiency

Every lab is aiming to get the most out of its samples with the least impact on the time-to-result. Easily deploy the Nanotrap® technology into your existing or new extraction workflow (Figure 1) to get more from poor quality real-world samples.



1. Mix Nanotrap® particles and virus-containing samples.
2. Separate Nanotrap® particles and captured viruses from sample.
3. Remove the supernatant and analyze.

Figure 1. Nanotrap® Virus Capture Kit workflow improves the performance of your downstream analytical methods by capturing and concentrating virions from complex biological samples.

Improved Sample Prep Method for Flu A RT-PCR

The Nanotrap® technology can enhance other sample preparation products to improve downstream analytical performance. The following data highlight the improvement in viral RNA isolation for flu A detection via RT-PCR.

Boost Assay Sensitivity

Pre-concentrating influenza virus with Nanotrap® particles upstream of nucleic acid isolation with QIAGEN spin columns has a significant impact on downstream RT-PCR detection. Flu A was spiked into viral transport media across five titration points. Nucleic acid recovery data is shown in Table 1. Also, Nanotrap® particles bring down intact virus (Figure 2), which can be used for infectivity assays.

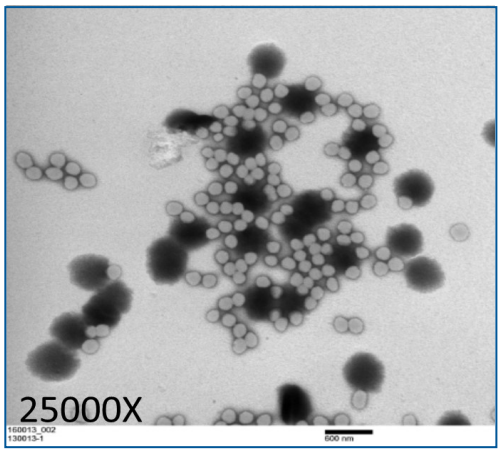


Figure 2. Electron microscopy images of VEEV TC83 and Nanotrap® particle interaction [1]

Theoretical Flu A concentration [copies/µL]	QIAGEN Spin Columns % Recovery	NT + QIAGEN Spin Columns % Recovery
50.0	34%	100%
25.0	25%	82%
5.50	21%	68%
2.00	BLD*	77%
0.55	BLD*	BLD*
Average	26%	82%

Table 1. Nanotrap® particles (NT) improve viral recovery.
*Below Limit of Detection (BLD)

Nanotrap® particles ***triple the nucleic acid yield*** as compared to QIAGEN column only

Clinical Relevance

Patient	Clinical Lab Result*	Ceres Workflow Result	Ct for Ceres Workflow
1	+	+	32.3
2	+	+	27.7
3	+	+	27.2
4	-	-	N/A
5	-	-	N/A
6	-	-	N/A

Table 2. Three flu positive samples from Discovery Life Sciences were tested using the Ceres workflow.

**Clinical Lab Result reported by Discovery Life Sciences*

Flu-positive and flu-negative patient samples were tested using the Nanotrap® Virus Capture Kit to concentrate the viruses prior to nucleic acid extraction and RT-PCR. As shown in Table 2, the positive and negative samples correlated to clinical panel results.

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Overcome Sample Volume Limitations

Let the Nanotrap® technology concentrate virus from larger volumes without disrupting your assay's sample input volume requirement. An array of sample input volumes for flu A concentrations across 4 Nanotrap® particle (NT) processed sample volumes are shown in comparison with the 150 µL QIAGEN column input volume (Figure 3).

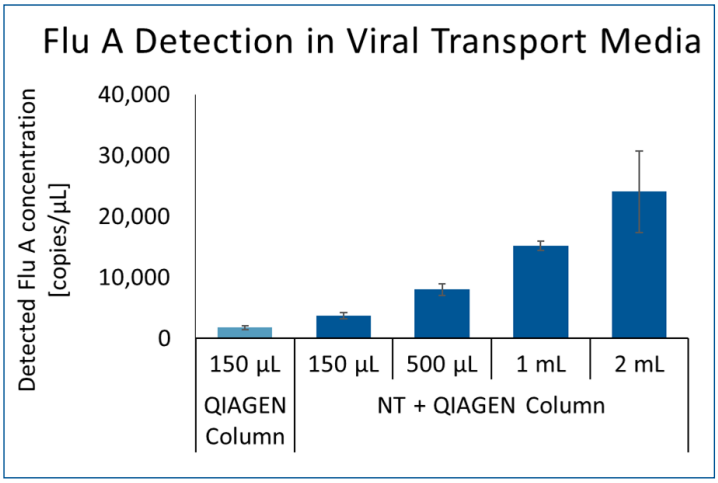

Figure 3. You can reduce your false negatives by increasing your starting sample volume by 14—fold.

Large Volumes and Sensitivity

When working with cell culture or a challenging sample where your pathogen concentration is low, volume is critical to detection. With the Nanotrap® capture-and-concentrate technology, the burden of having to do many centrifugation steps or repeatedly applying sample to a column has been solved. In a 3 mL low concentration spiked transport media sample (1000 cp/mL), the Nanotrap® Virus Capture Kit and a simple glycogen precipitation method recovered the highest yield (Figure 4).

Reaching the lower limit of detection for an assay can be challenging within a large dynamic range. This kit provides a reproducible method for improving assay sensitivity you need for your assay. In 2 mL spiked transport media samples, the Nanotrap® technology significantly improved the nucleic acid yield of a commercially available extraction kit (Figure 5), taking the detectable amount of Influenza A down to less than 1 copy/µL.

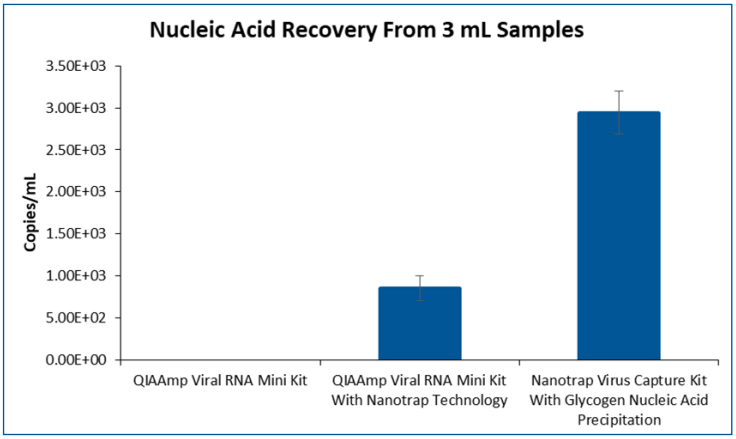

Figure 4. Increase your nucleic acid quantity and eliminate tedious centrifugation and column filtration steps by using the Nanotrap® Virus Capture Kit with a simple glycogen nucleic acid precipitation method.

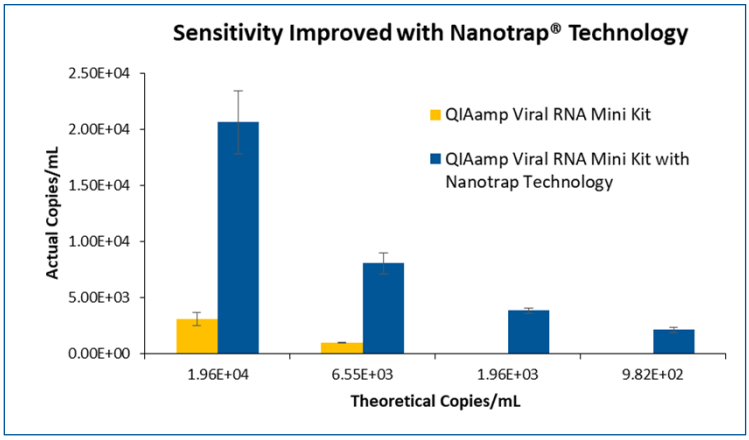

Figure 5. Spiked transport media sample extracted with the QIAGEN kit or with the Nanotrap® Virus Capture Kit followed by extraction with the QIAGEN kit and analyzed by RT-qPCR. The Nanotrap® Virus Capture Kit significantly improved nucleic acid yield for samples below 2,000 copies/mL.

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Compatible with Today's Workflow

The Nanotrap® Virus Capture Kit leads to very high nucleic acid yield when coupled with a simple glycogen precipitation method. If you prefer to maintain your current workflow, the Nanotrap® Virus Capture Kit is easily integrated into your mainstream workflow and aids in increased performance.

The Nanotrap® Virus Capture Kit improves the yield of the leading nucleic acid extraction kits on the market, including the QIAAmp Viral RNA Mini Kit (QIAGEN), High Pure Viral RNA Kit (Roche), PureLink Viral RNA/DNA Mini Kit (Thermo Fisher Scientific), NucleoSpin Virus Kit (Takara), and a standard glycogen precipitation method (Glycogen) (Figure 6).

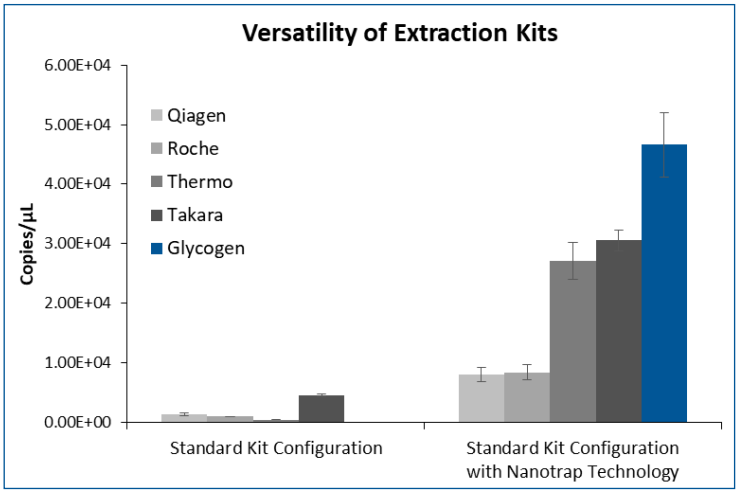

Figure 6. Increase your ability to capture, concentrate, and extract critical analytes for your downstream assay.

Workflow Simplification

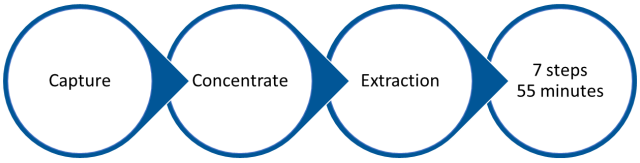

Figure 7. Reduce error when using the Nanotrap® Virus Capture Kit and a glycogen precipitation method with only 7 steps compared to an average of more than 12 steps with the competition.

Incorporating the Nanotrap® technology into your workflow is simple. No more than 4 steps added to your current workflow. Just 7 steps total for the entire process (Figure 7) if you perform the capture, concentrate, and extraction with the Nanotrap® Virus Capture Kit and glycogen precipitation. This enables you to increase your total starting sample volume by 7-fold while maintaining your specific downstream sample volume.

Our Commitment to Your Success

Our dedicated scientific team takes a collaborative approach with our partners. In order to deliver the highest quality, most innovative solutions, we empower out-of-the box thinking through consultative development and support.

Together we can solve your sample preparation challenges.

Please visit **ceresnano.com** to learn more.

[1]Callahan V, et al. Use of Nanotrap® particles for capture and enrichment of febrile-illness-causing pathogens including Zika, Chikungunya, Dengue and Influenza viruses. Poster presented at: ASM Clinical Virology Symposium; 2018 May; West Palm Beach, FL..

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