

Streamlined SARS-CoV-2 Wastewater Monitoring And the Power of Automation

As the SARS-CoV-2 virus continues to threaten human health, the use of wastewater surveillance programs to monitor and predict future viral burden have grown worldwide.

Thermo Fisher Scientific has developed cost-effective kits and automated instruments to minimize hands-on time and support school, county, or city-wide testing program. Take a look at each step in a typical workflow and see how we're bringing accuracy and efficiency to COVID-19 wastewater monitoring.

Sample Collection

Untreated wastewater or primary sludge can be used as samples for wastewater monitoring workflows, but there are advantages and drawbacks to each.



Untreated Wastewater

Advantages

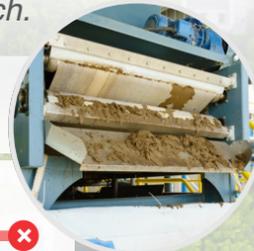


- Easy to collect

Drawbacks



- Large volumes (50-1000 mL) collected
- Requires viral/pathogen target enrichment



Sludge

Advantages



- High concentrations of viral particles
- Identify rare cases

Drawbacks



- Can contain downstream inhibitors
- Challenging sample type for extraction

Viral Concentration

Viral particles are often dilute in untreated wastewater and viral concentration is needed prior to nucleic acid extraction



Commonly-used manual methods rely on significant hands-on time and low-throughput

- Ultracentrifugation
- Precipitation
- Filtration

Magnetic bead-based methods support high-throughput, automated viral concentration

Dynabeads™ Wastewater Intact Virus Enrichment

- Automate with KingFisher™
- Fast isolation kinetics
- Easy viral release
- **Process 96 samples in 20 minutes**



Nucleic Acid Extraction

The purification method chosen will depend on sample type, throughput required, and other factors



Chemical and column-based methods aren't optimized for challenging sample types or large scales

- TRIzol
- Column-based

Magnetic beads enable automated extraction from diverse and challenging sample types

MagMAX™ Wastewater Ultra DNA / RNA Extraction Kit

- Automation-ready
- Mechanical disruption
- High-quality RNA and DNA
- **Extract 96 samples in ~1 hour**



Real-time PCR

Quantify SARS-CoV-2 concentration with a range of RT-PCR platforms and target-specific TaqMan assays

Plan your high-throughput wastewater monitoring workflow today at thermofisher.com/contactus