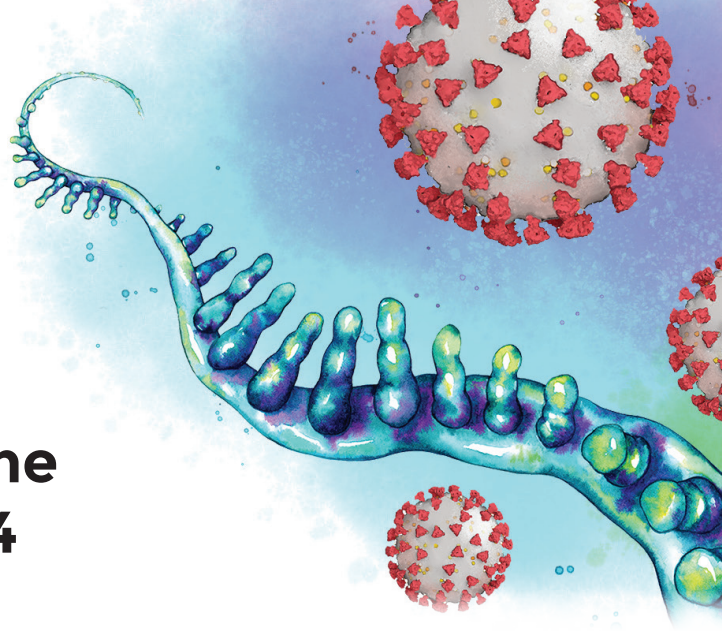
FLUIDIGM®



Scalable, high-throughput pathogen detection with the Advanta RT-PCR Kit–192.24

Infectious disease research plays a critical role in improving global health care. Information acquired from research drives public health policy for preventive measures, drug treatment and vaccine development. PCR based applications such as reverse transcription polymerase chain reaction (RT-PCR) are commonly used to detect viral and bacterial pathogens in clinical and pathogen research.

The Advanta™ RT-PCR Kit provides significant cost and time advantages over alternate technologies by processing samples at nanoliter-scale volumes with walkaway automation. Using the 192.24 Dynamic Array™ IFC (integrated fluidic circuit) enables rapid data acquisition of up to 192 samples across 24 targets every 35 minutes.

Highlights

Efficient—Use up to 50 times less reagent than traditional PCR methods.

Scalable—Run up to 6,000 samples per day per instrument system.

Informative—Detect up to 24 unique pathogens per sample, including SARS-CoV-2, influenza A and other respiratory disease pathogens.

Simple Low-Labor Workflow

1

Prepare samples

Perform 1-step reverse transcription and preamplification on up to 192 purified RNA, DNA or saliva samples.

2

Prepare IFC

with assays and preamplified samples.

3

Load IFC

on Juno™ or IFC Controller RX.

4

Perform real-time PCR

and data acquisition using Biomark™ HD.

Total time to results: 2 hours 20 minutes

Comparison to Conventional Molecular Methods

System		Biomark HD	Traditional Real-Time PCR Instrument	
Format		192.24 Dynamic Array IFC	96-well PCR	384-well PCR
Samples	Per run	192	96	384
Maximum targets per sample		24	1	1
Independent reactions		4,608	96	384
Sample throughput using 3-target detection panel*		192	32	128
Volume of PCR master mix used per reaction		0.1 µL	5 µL	5 µL

*Viral detection assays generally utilize multiple primer sets to detect viral presence, which limits the sample throughput of traditional PCR plates. For example, the CDC 2019-nCoV Real-Time RT-PCR Diagnostic Panel includes 3 primer sets, resulting in a 3x decrease in the number of samples that can be run per plate in standard 96- and 384-well formats.

Table 1. The 192.24 Dynamic Array IFC tests 192 samples with up to 24 assays in a single run, performing 4,608 simultaneous PCR reactions. These reactions are performed at the nanoscale level and use 50 times less reagent than typical 20 µL PCR reactions for viral RNA detection.

Performance Characteristics

Copy per µL	Copy per Reaction	Replicates	Overall Detection Rate of N1 and N3 (POS/Total)	
2	10	24	24/24	100%
1	5	24	24/24	100%
0.6	3	24	23/24	96%
0.2	1	24	22/24	92%
0	0	24	1/24	4%

Table 2A. UHRR and Synthetic SARS-CoV-2

Copy per µL	Copy per Reaction	Replicates	Overall Detection Rate of N1 and N3 (POS/Total)	
12.5	30.0	24	24/24	100%
6.25	15.0	24	24/24	100%
3.125	7.5	24	20/24	83%
1.563	3.8	24	9/24	38%
0	0	24	0/24	0%

Table 2B. Saliva and Inactivated SARS-CoV-2 Virus

Tables 2A and 2B. Performance characteristics for various sample types with Advanta RT-PCR Kit—192.24. 2A) In our performance characteristic testing, a serial dilution of SARS-CoV-2 synthetic RNA was spiked in a 5 µL solution containing 5 ng of Universal Human Reference RNA (UHRR). Nucleic acid amplification reactions were performed across 24 sample replicates using N1 and N3 CDC assays (IDT). Each assay was replicated 4 times in the IFC run. Results from internal testing displays the capability to detect down to 0.6 copies/µL with >95% confidence. 2B) The Advanta RT-PCR Kit—192.24 is also compatible with using saliva as a sample. To demonstrate performance, inactivated SARS-CoV-2 viral particles were spiked into control saliva samples and tested with the same experimental plan as Table 2A. Results from internal testing displays the capability to detect down to 6.25 copies/µL with 95% confidence.

Ordering Information

Product	Product Description	Part Number
Instruments	Biomark™ HD	BMKHD-BMKHD
	Juno™	101-6455
IFC and reagent kit bundles	Advanta™ RT-PCR Kit—192.24, 10 IFCs	102-0424
	Advanta RT-PCR Kit—192.24, 2 IFCs	102-0525

Learn more about Fluidigm innovation at fluidigm.com/viral-detection

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