



opentronsTM
Robots for Biologists

COVID-19 Testing Workstations
with BPGx

Opentrons Summary

- Affordable lab automation
- Mission to provide lab automation to the 90%+ that cannot access
- Founded in 2013
- \$20M+ in funding from Khosla Ventures, Jeff Kindler (ex-CEO of Pfizer), Lerer Hippeau Ventures
- 1,500+ labs, 45+ countries
- Affordability, flexibility, ease of use
- Stanford, MIT, Boston University, Imperial College London, Sanger Institute

Executive Summary

- Fully automated solution for collection tube reformatting, RNA extraction, and qPCR prep of COVID-19 assay.
- Enables testing 2,400 samples per 24 hrs.
- Entire system can be fulfilled within 10 days of order placement.
- Total cost of \$100,000 including hardware, support, and setup.
- Lowest hardware and consumables cost of any option on the market, and fastest to deploy.

Process

- 1. Sample Plating
- 2. RNA Extraction
- 3. qPCR Setup
- 4 qPCR Assay (not on Opentrons)

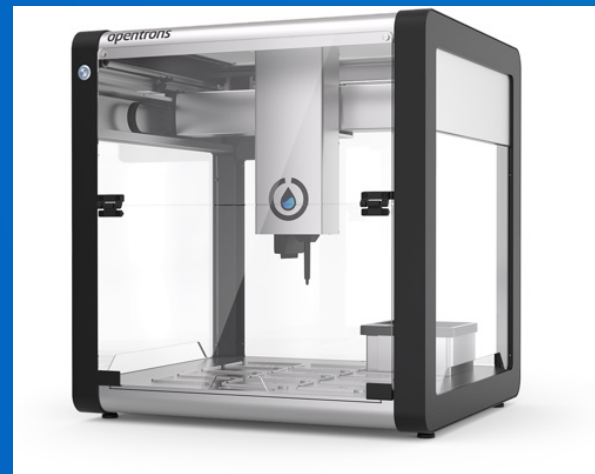
Sample Plating

RNA Extraction

qPCR Setup

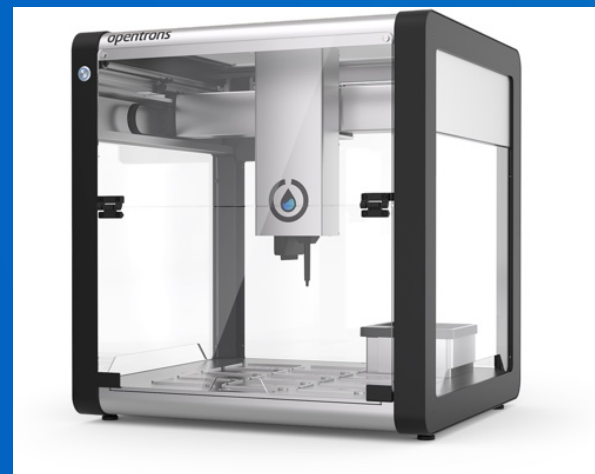
qPCR Assay

Three Workstations



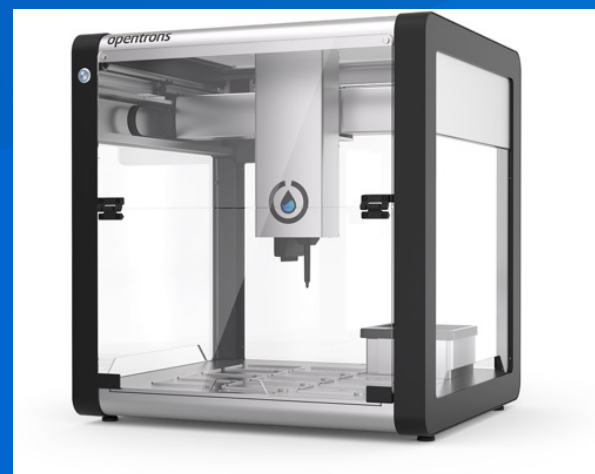
A

Station A: Collection Tube Plating
96 samples = 0.5 hrs



B

Station B: RNA Extraction
96 samples = 3 hrs



C

Station C: qPCR Prep
96 samples = 1 hr

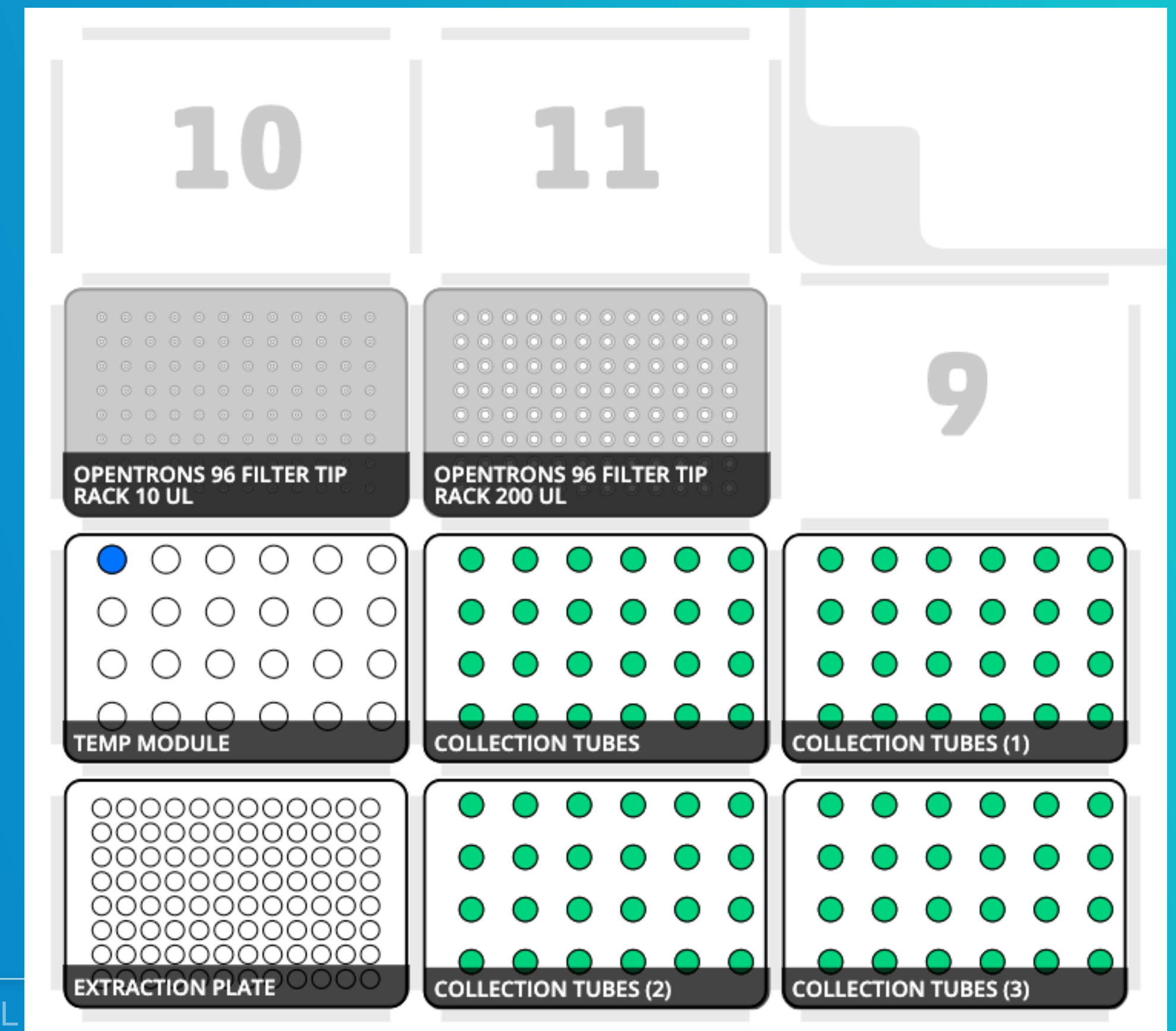
Station A: Collection Tube Plating

Objective: reformat samples from collection tubes to extraction plates

Throughput: 96 samples / 0.5 hrs (upstream de-capping = bottleneck)

OT-2 Configuration: \$9,050

- p20 + p300 single-channel pipette
- Temperature Module
- 4x tube racks
- 96 Deepwell Extraction Plate
- 1x rack 20ul + 1x rack 200ul filter tips



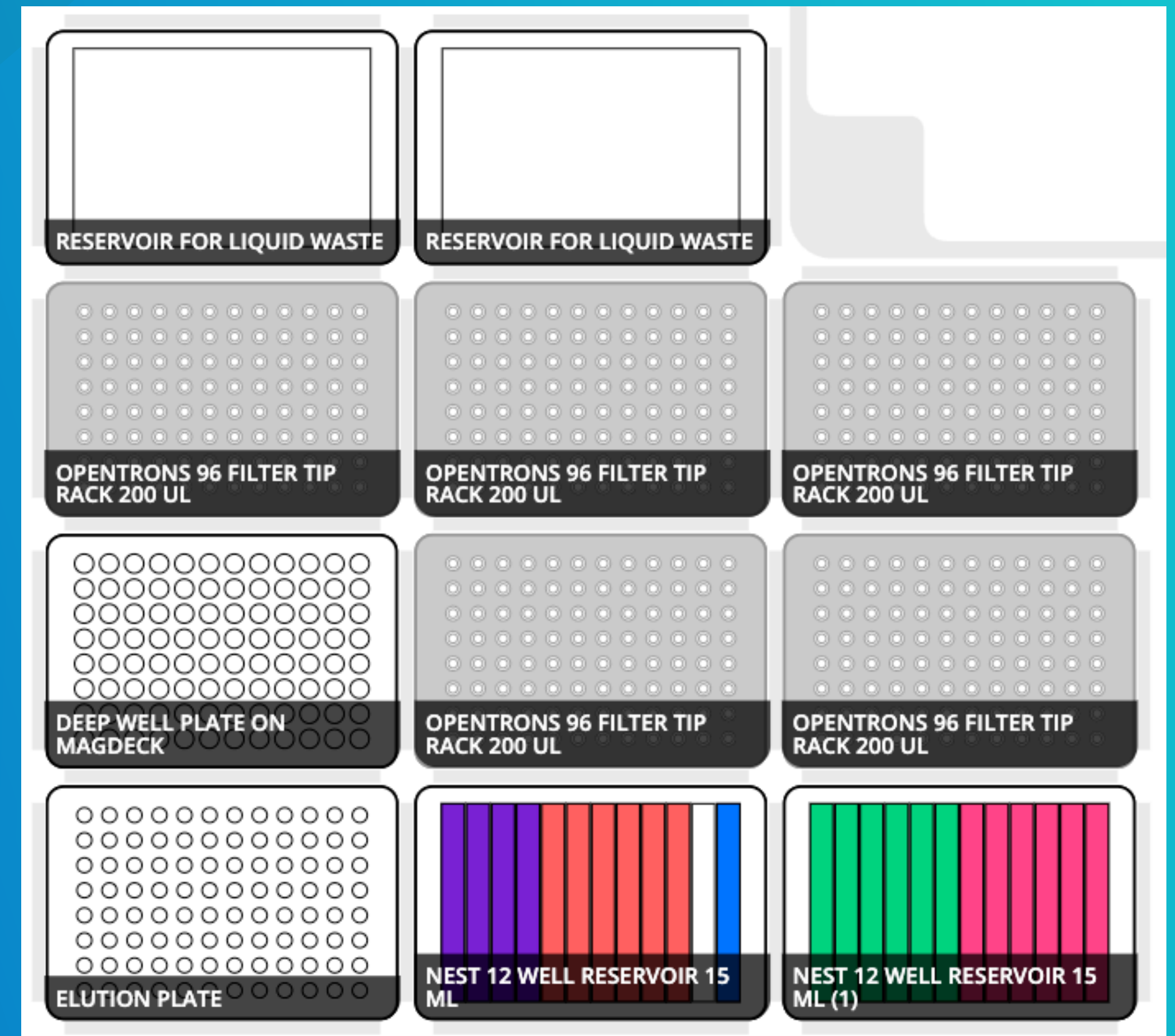
Station B: RNA Extraction

Objective: purify RNA from swab buffer with magnetic beads

Throughput: 96 samples / 3hrs

OT-2 Configuration: \$7,750

- p300 8-channel
- Magnetic Module
- 96 Deepwell Extraction Plate
- 96 Well Elution Plate
- 5x racks of 200ul filter tips
- Reservoirs (12- & 1- channel)



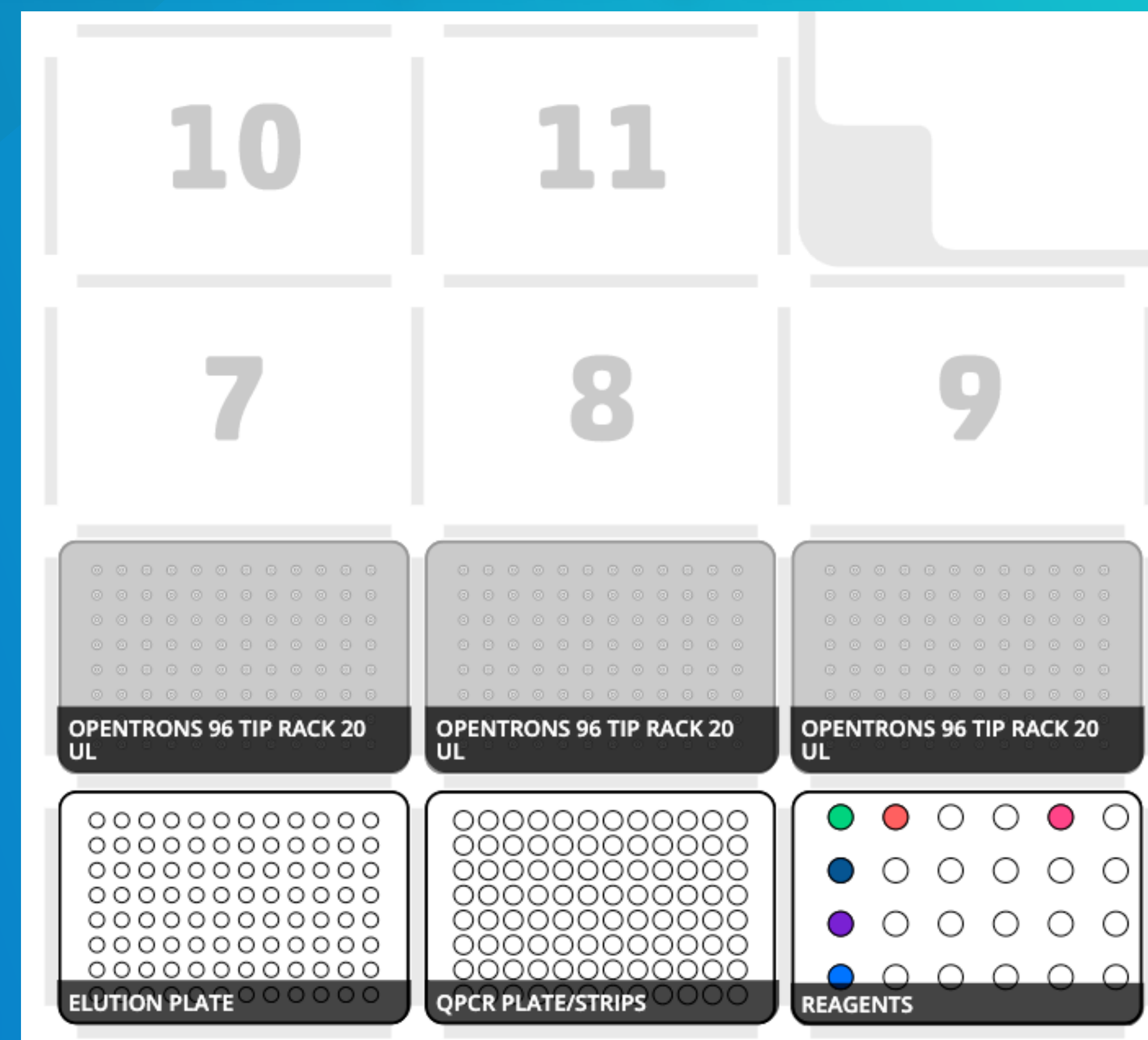
Station C: qPCR Preparation

Objective: Prepare Reaction Mixes and add samples for qPCR

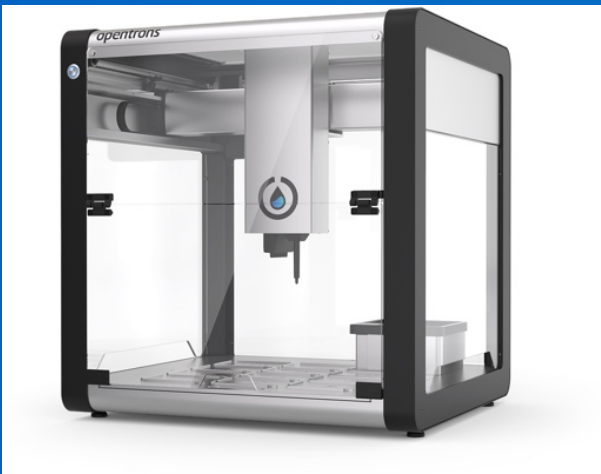
Throughput: 96 samples / 1 hr

OT-2 Configuration: \$7,500

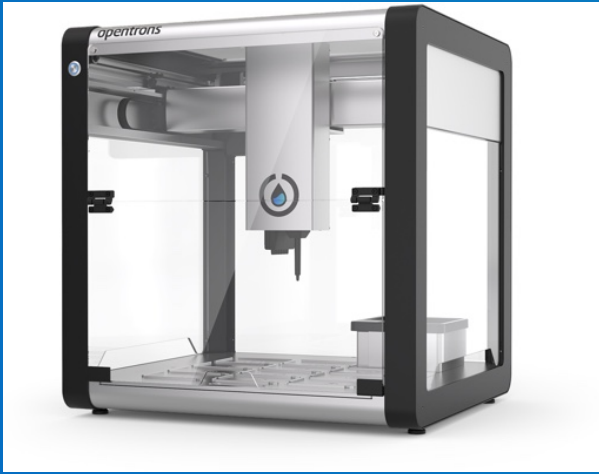
- p20 single-channel
- Opentrons Temperature Module
- 96 Well Elution Plate
- 96 Well PCR Plate
- 3x racks 20ul filter tips



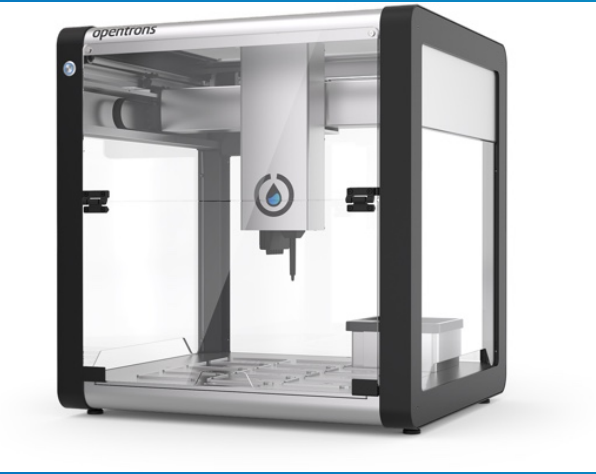
Suggested Configuration



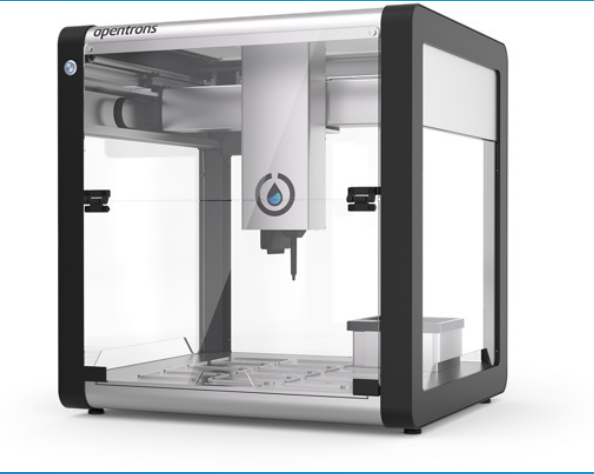
A1



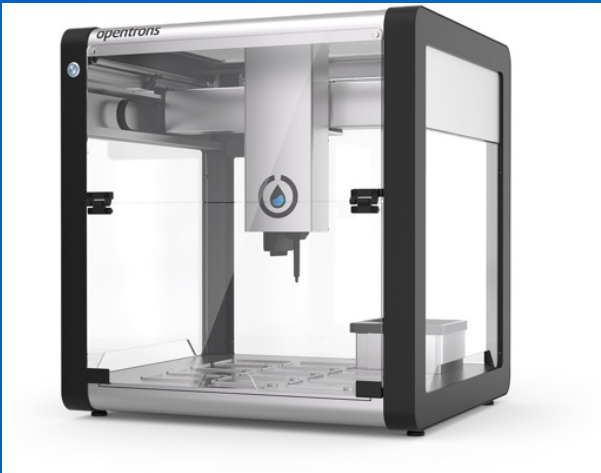
B1



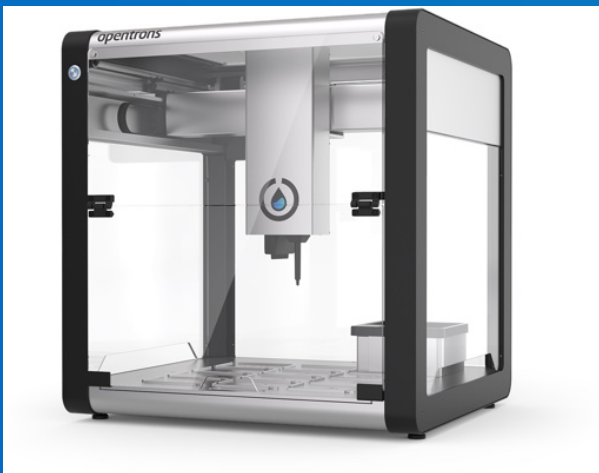
B2



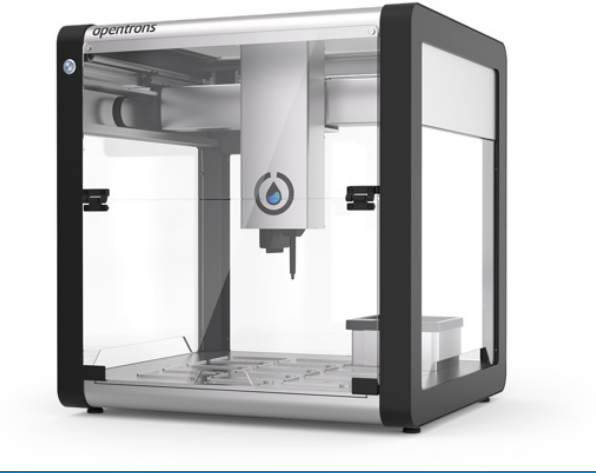
C1



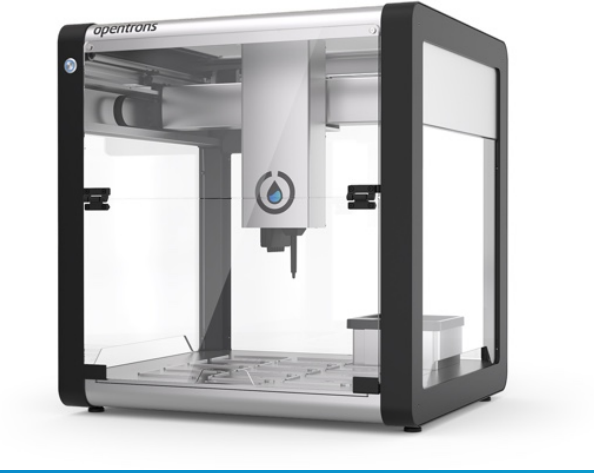
A2



B3



B4



C2

Throughput:
12 plates / 12hrs

	System A	System B	System C
Number of Systems	2	4	2

Throughput Breakdown - 12 Plates / 12 Hrs

1hr	2hr	3hr	4hr	5hr	6hr	7hr	8hr	9hr	10hr	11hr	12hr	
A1	B1	B1	B1	C1	DATA							
A2	B2	B2	B2	C2	DATA							
	A1	B3	B3	B3	C1	DATA						
	A2	B4	B4	B4	C2	DATA						
		A1		B1	B1	B1	C1	DATA				
		A2		B2	B2	B2	C2	DATA				
			A1		B3	B3	B3	C1	DATA			
			A2		B4	B4	B4	C2	DATA			
				A1			B1	B1	B1	C1	DATA	
				A2			B2	B2	B2	C2	DATA	
					A1			B3	B3	B3	C1	DATA
					A2			B4	B4	B4	C2	DATA

Suggested Full Package

	Unit	Price
Plate Reformatting Station (A)	2	\$18,100
RNA Extraction Station (B)	4	\$31,000
qPCR Setup Station (C)	2	\$15,000
1 extra of each hardware component	1	\$19,050
Reagent Filling Station	1	\$5,950
5 days 2x Opentrons on-site support people	1	\$6,900
Shipping	1	\$4,000
TOTAL		\$100,000

Delivery within 10 days of purchase.

Up and running in 5 days.

Ramp to 1M Tested Samples

5 week ramp to 100k tests / week full capacity (10 labs running 10k samples / week, representing 70% of labs’ max capacity).

First 1m tests done 15 weeks from now.

