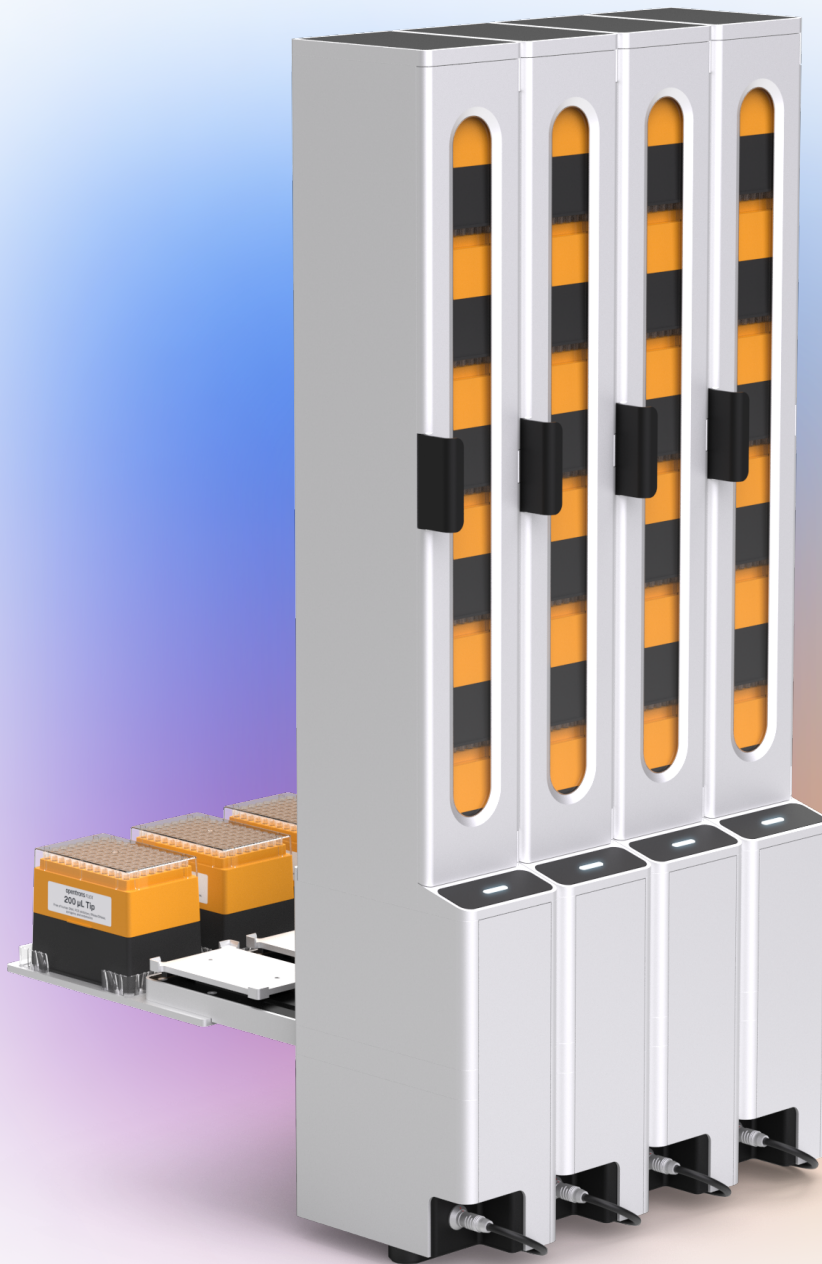# Opentrons Flex® Stacker

5x the throughput without 5x the space
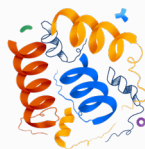
**How will you Flex it?**

# Maximize your throughput with the Opentrons Flex Stacker

The Opentrons Flex Stacker is a modular tip and plate storage and delivery system designed to enhance the throughput of your laboratory workflows while conserving valuable deck space. Easily installable onto the Opentrons Flex expansion slots, each stacker can accommodate up to 7 tip racks, 48 PCR plates, or 16 deep well plates. With the capability to integrate up to four stackers without significantly increasing the instrument's footprint, the Flex Stacker enables efficient processing of up to 96 NGS samples in a single run, making it an ideal solution for high-throughput genomics and proteomics applications
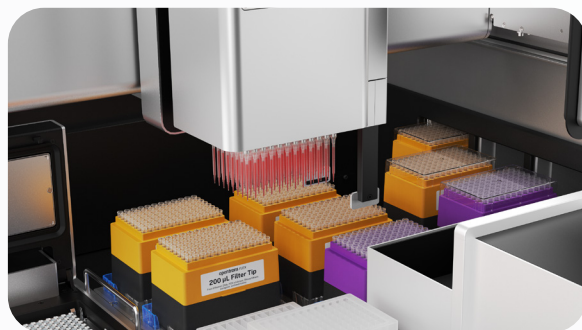


**Genomics**



**Proteomics**



**High-throughput screening**

## Increased Deck Space

The Opentrons Flex Stacker allows you to fit up to five times more labware into your workflow without increasing the instrument's footprint, enabling high-throughput processing while preserving valuable deck space.





## Seamless and Modular Installation

Designed for seamless integration, the Flex Stacker can be easily installed onto the Opentrons Flex expansion slots, allowing you to add up to four stackers as your throughput needs grow.

## Effortless Programming

With Opentrons' intuitive software solutions, incorporating the Flex Stacker into your protocols is straightforward, enabling efficient automation of complex workflows.

# The Opentrons Flex Stacker in Action!

To demonstrate the effectiveness of the Opentrons Flex Stacker, we successfully automated two popular DNA library prep chemistries, that use mechanical shearing and enzymatic fragmentation respectively, at 96-sample throughput.

## Key Findings

The Opentrons Flex Stacker supports walkaway automation of popular DNA library preparation kits, resulting in high-yielding, consistent librairies.
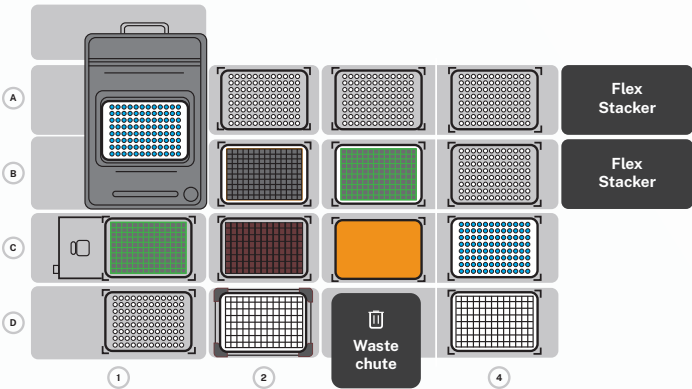
**Figure 1.** Deck layout for automating library preparation for 96 samples using IDT xGEN MC[1] and Twist EF 2.0[2] kits on the Opentrons Flex High-Throughput NGS Workstation

Row A: (A1) On Deck Thermocycler Module with Sample Plate, (A2-A3) Tip Racks. (A4) Flex Stacker Module with Tip Racks

Row B: (B2) Waste Reservoir, (B3) Reagent Plate 2, (B4) Flex Stacker Module with Tip Racks

Row C: (C1) Temperature Module with Reagent Plate 1, (C2) Reagent Reservoir, (C3) Plate Lids, (C4) Deck Extension with Final Sample Plate

Row D: (D1) Tip Rack, (D2) Cleanup Plate 1, (D3) Waste Chute Extension, (D4) Deck Extension with Cleanup Plate 2

**Table 1.** Sequencing Results depicting the GC Content, Percent Passing Filter, Quality >30 and Percent Mapped for Lambda Samples prepared with IDT xGen MC and Human Genomic Samples prepared with Twist EF 2.0, on a 2 x 150 MiSeq Run.

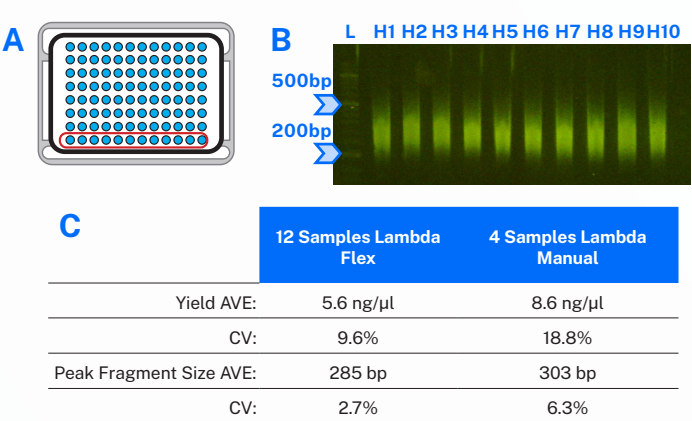| | IDT xGen MC | | Twist EF 2.0 | |
|---|---|---|---|---|
| | Lambda | CV | Human Genomic | CV |
| GC content | 49.21% | 2.27% | 41.85% | 0.12% |
| % PF | 98.55% | 0.47% | 99.40% | 0.00% |
| Q30 | 94.44% | 0.56% | 94.74% | 0.12% |
| % Mapped | 98.73% | 1.02% | 100.00% | 0.00% |

**Figure 2.** IDT xGen MC Library Preparation (A) Sample Plate Layout, (B) Library Fragment Sizes, 2% E-Gel, E-Gel Sizing DNA Ladder, (C) Library Yield, Flex and Manual Comparison.
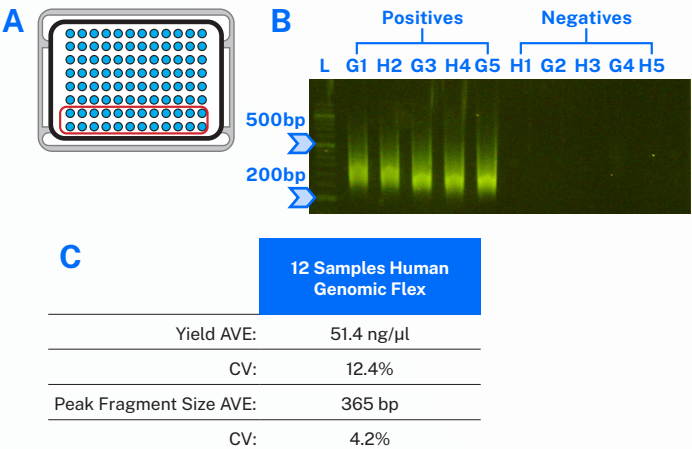
| | 12 Samples Lambda Flex | 4 Samples Lambda Manual |
|---|---|---|
| Yield AVE: | 5.6 ng/µl | 8.6 ng/µl |
| CV: | 9.6% | 18.8% |
| Peak Fragment Size AVE: | 285 bp | 303 bp |
| CV: | 2.7% | 6.3% |

**Figure 3.** Twist Library Preparation Enzymatic Fragmentation Kit 2.0 (A) Sample Plate Layout, Row G and H Tested in a Checkerboard pattern, (B) Library Fragment Sizes, Library Fragment Sizes 2% E-Gel, E-Gel Sizing DNA Ladder, representative Positive and Negative Samples, (C) Library Yield, Positive and Negative Control Comparison.

| | 12 Samples Human Genomic Flex |
|---|---|
| Yield AVE: | 51.4 ng/µl |
| CV: | 12.4% |
| Peak Fragment Size AVE: | 365 bp |
| CV: | 4.2% |

# Specifications

| | |
|---|---|
| **Installation Capacity** | 4 |
| **Compatible Labware** | Opentrons Flex Tip Racks, PCR plates, flat bottom plates, deep well plates |
| **Labware Capacity** | 7 tip racks, 48 PCR / flat bottom plates, 16 deep well plates |
| **Material** | Aluminum / Polycarbonate |
| **Dimensions (mm)** | 957.5 x 106 x 194.5 |
| **Weight** | 18kg / 40lbs |
| **Electrical Input** | 6.4A 115VAC, 3.2A 230VAC |
| **Electrical Output** | 48V, 2.7A |

**Storage door**

**Delivery and storage belt**

**Power input**

Get hands-on support, services and training with our Flex Service offerings.

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