AUTOMATION PLATFORMS
Solutions for Pre-analytical Sample Preparation
Accelerate Discoveries in Bio-analysis with Cutting-edge, Pre-analytical, Sample-prep Solutions

Even with advanced analytical technologies, low quality biomolecules will result in low quality data. We have developed an optimized and non-degrading sample-prep platform to help you improve sample quality.

How Covaris can Help

- Increase quality results from various sample types
- Transform high-throughput bio-analytical applications
- Standardize clinical sample-prep
- Set new standards in cell lysis, biomolecule extraction, and sample processing

Our Technology

Covaris developed Adaptive Focused Acoustics® (AFA®) technology which is used in all Covaris Focused-Ultrasoundicators to advance sample preparation. AFA is highly tunable and controllable and aids in standardizing pre-diagnostic sample preparation using mechanical shearing forces to process samples in a non-contact, isothermal environment. The result is a robust sample process that reduces sample to sample variation while maintaining sample analyte integrity.

Figure 1. AFA-energetic reproducibly processes samples in a temperature-controlled and non-contact environment

Figure 2. The water bath maintains sample temperature and pressure, and only convergent acoustic energy enters the sample vessel.

AFA Benefits

- Non-contact and isothermal: no biomolecule degradation
- Isothermal processing ensures optimal sample integrity
- Tunable and robust energy delivery with AFA
- Single sample to high throughput sample processing (96- and 384-well plates)
- Ultra-high frequency energy: quick processing time

World-class Performance for your Applications

AFA in Pre-analytical Sample Prep

- Mechanical shearing for Next Generation Sequencing (NGS)
- DNA/RNA Extraction from Formalin-Fixed, Paraffin-Embedded (FFPE) tissue samples, and whole blood for NGS
- Chromatin mechanical shearing for ChIP-Seq
- Biomarker extraction for research and clinical microbiology
- Tissue disruption & homogenization
- Cell lysis
- Compound dissolution
Automation Friendly Focused-ultrasonicators

AFA-TUBE
AFA Consumables Designed for High-throughput Automation
The AFA-TUBE is a specially engineered polymer vessel designed to facilitate the use of automated liquid handling and laboratory robotics with AFA-based sample preparation. The AFA-TUBE has been developed in an 8-strip, 96-, and 384-well plates to fit all your lab's needs. This suite of automation-compatible acoustical cuvettes is optimized for both access by liquid handler tips and for integration with standard laboratory automation. Complies with the ANSI/SBS-4 standards.

- Conical bottom
- Ideal for 10 to 50 µL volumes
- RFID-enabled sample chain of custody and multi-plate, batch processing
- Library-prep compatible
- Compatible with most liquid handlers
- Heat block and thermocycler compatible
- No fiber required

Lab Integration using Covaris Certified Consumables Designed to Simplify your Automated Workflow
Universal Downholder
To simplify automating AFA Consumables, Covaris has developed a Downholder to hold microTUBE and AFA-TUBE plates on-deck during all pipetting steps. This system prevents plates from lifting off the deck of a liquid handler when the tips are withdrawn from the seals.
The Future is Here: Introducing the R230

Unprecedented Results and Speed, Space Saving Design, and Automation-ready Solution

The compact R230 Focused-ultrasonicator was designed to be implemented with your existing liquid handler to help you achieve optimal workflow efficiency, full automation, and standardized sample prep for NGS. The unique scanning processing motion and precise control of AFA-energetics, transforms standard sample-prep, and enabling high-throughput sample processing of up to 384 samples using the AFA-TUBE Plate.

Integration capabilities and drivers are available for the following liquid handlers: Tecan, Hamilton, Dynamic Devices, and Beckman Coulter (non-exhaustive list).

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
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<tbody>
<tr>
<td>Powered by AFA-energetics</td>
<td>Controlled, non-contact processing</td>
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<td>Direct on-deck integration</td>
<td>Compatible with most liquid handlers</td>
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<td>Isothermal energy delivery</td>
<td>Maintains optimal sample integrity</td>
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<td>Automation compatible with integrated RFID</td>
<td>Sample tracking and reduced human error</td>
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<td>Automated water management</td>
<td>User-defined scheduling for system set-up maximizes laboratory efficiency</td>
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<tr>
<td>Eliminates columns and centrifugation</td>
<td>Higher recovery, lower cost, and faster turn-around-time (TAT)</td>
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**LE220R-plus Focused-ultrasonicator**

The LE220R-plus is the robotic version of the LE220-plus with an opening for a robotic arm to grip the sample plate with motion sensors for safety. Column of 8 to full plate processing in a single batch with scheduled system set-ups for degassing, chilling, and automated water level adjustments.

**Key Features:**

- Automation-ready with robotic arm capability
- Designed for integration with high-throughput laboratory automation
- No water adjustment is necessary
- User-defined scheduling for system set-up maximizes laboratory efficiency

**Key Success: ARUP Laboratories**

**A Fully Automated Solution for DNA Fragmentation**

**Collaboration Objectives:**

- Automate mechanical DNA fragmentation
- Deliver superior and consistent results
- Tunable for various sample types and specimen quality
- Certified light curtain to maintain safety standard

LE220R-plus integrated into central robotic frame of ARUP’s NGS Workcell. Docking carts are powered and networked upon connection and locked into place. Docking carts have auto-fill enabled through a separate connection to deionized water. ThermoCube and WCS are nested in cart with UPS. LE220R-plus integrated into central robotic frame of ARUP’s NGS Workcell.

**Success: 24/7, 365 Facility Operation!**

Liquid handling automation, coupled enhanced sample traceability, analytics integration (closes the loop), reduced human intervention, and increased throughput.
This assay provides clinicians with a comprehensive immune profile of their patient, greatly improving their ability to select a personalized immunotherapy treatment based on their patient’s unique gene expression (OmniSeq website, www.omniseq.com/irc).

Automation Partners & Collaborations

Customers who use the Automation Integration Package have been able to successfully integrate our Covaris instrument with liquid handlers from a variety of vendors.

Automation Software

SonoLab Software and Automation Integration Packages

SonoLab Software is used in conjunction with the Covaris’ Focused-ultrasonicator instruments for the processing of biological or chemical samples. Our proprietary software provides a user interface for manual control of the instrument, as well as an “integration interface” and an API for automation options.

Covaris offers an Automation Integration Package that includes an API developer’s kit to enable users to easily integrate Covaris instruments with current liquid handling systems and other laboratory robotic automation.

Contact Covaris today to discuss your needs and the potential of the AFA technology!

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Figure 1. Similar cfDNA and DNA library preparation yields between manual vs. automated methods with comparable downstream sequencing results.

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