Automated Sample Preparation Combining Adaptive Focused Acoustics® (AFA®) and Single Pot Solid Phase Sample Preparation (SP3)

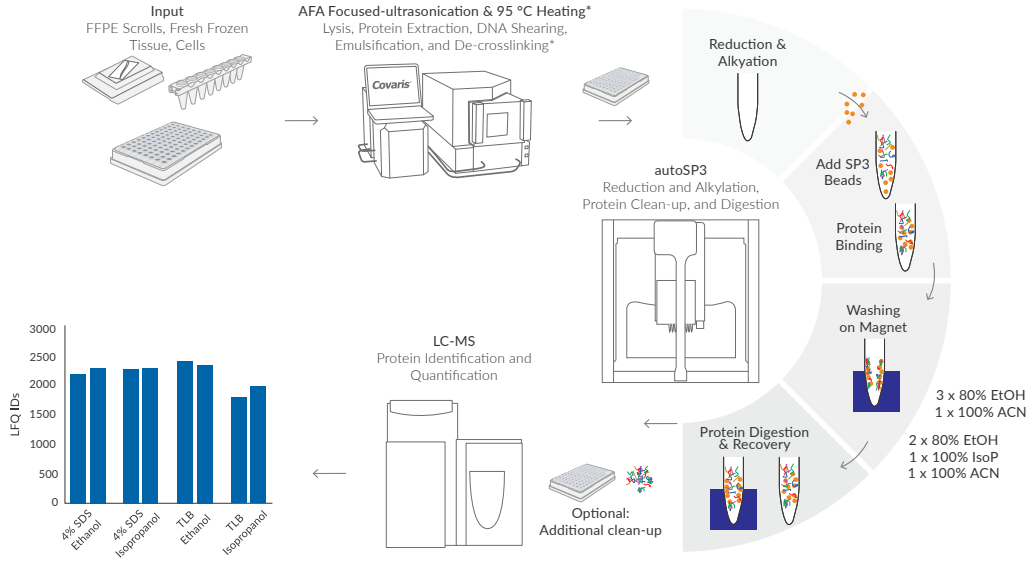
Scientific Relevance

Sample preparation can significantly impact the quality of data in both academic and clinical research. Proteomics analytical methods require robust, reproducible, and streamlined protocols [1,2]. This document presents an automated, high-throughput workflow yielding highly reproducible results [3].

Challenges

- Numerous transfer steps are involved in current proteomics sample prep workflows, increasing the risk for sample loss, contamination, and errors
- High-throughput and low volume processing is challenging
- Some samples can be particularly difficult to process with reproducibility

Workflow



Lysis and homogenization steps are performed using a Covaris instrument. Reduction, clean-up (or purification), and digestion are conducted using an Agilent Bravo.

The workflow efficiency enables buffer flexibility, including detergent-based buffers (containing SDS up to 5%).

*Heating at 95 °C requires a block heater or a PCR instrument.

Adapted from and with courtesy of Jeroen Krijgsveld, DKFZ, Heidelberg

Advantages of the Covaris Workflow

- Seamless integration of Adaptive Focused Acoustics with single pot processing: the sample remains in the same plate or strip throughout the whole process
- Direct treatment of various sample types including FFPE or fresh tissue and cells
- Full hands-off treatment and fast turn-around-time in combination with Agilent Bravo robot

Suggested Products

- Covaris Instruments: ML230, LE220Rsc, and R230
- Covaris Consumables: 8 AFA-TUBE TPX Strip, 96 AFA-TUBE TPX Plate, and 384 AFA-TUBE 20 PP Plate
- Agilent Bravo platform

References

1. Single-pot, solid-phase-enhanced sample preparation for proteomics experiments – Hughes et al, Nat Protoc. 2019 Jan;14(1):68-85. DOI: 10.1038/s41596-018-0082-x
2. Ultrasensitive proteome analysis using paramagnetic bead technology, Hughes et al, Mol Syst Biol. 2014 Oct 30;10(10):757. DOI: 10.15252/msb.20145625
3. Automated sample preparation with SP3 for low-input clinical proteomics, Mueller et al, Mol Syst Biol (2020)16:e9111 DOI: 10.15252/msb.20199111

USA: Tel: +1 781.932.3959 | Email: customerservice@covaris.com | Europe: Tel: +44 (0)845 872 0100 | Email: emeacustomerservice@covaris.com | APAC: +86 137 6427 6714 | Email: APACcustomerservice.com
Web: www.covaris.com | Applications: applicationsupport@covaris.com | Service and Support: techsupport@covaris.com | M020152_RevA_Mar2021 | 2021© Covaris, Inc.