Hands-off Sample Preparation Workflow for Laser Capture Microdissection (LCM) Samples using Adaptive Focused Acoustics® (AFA®)

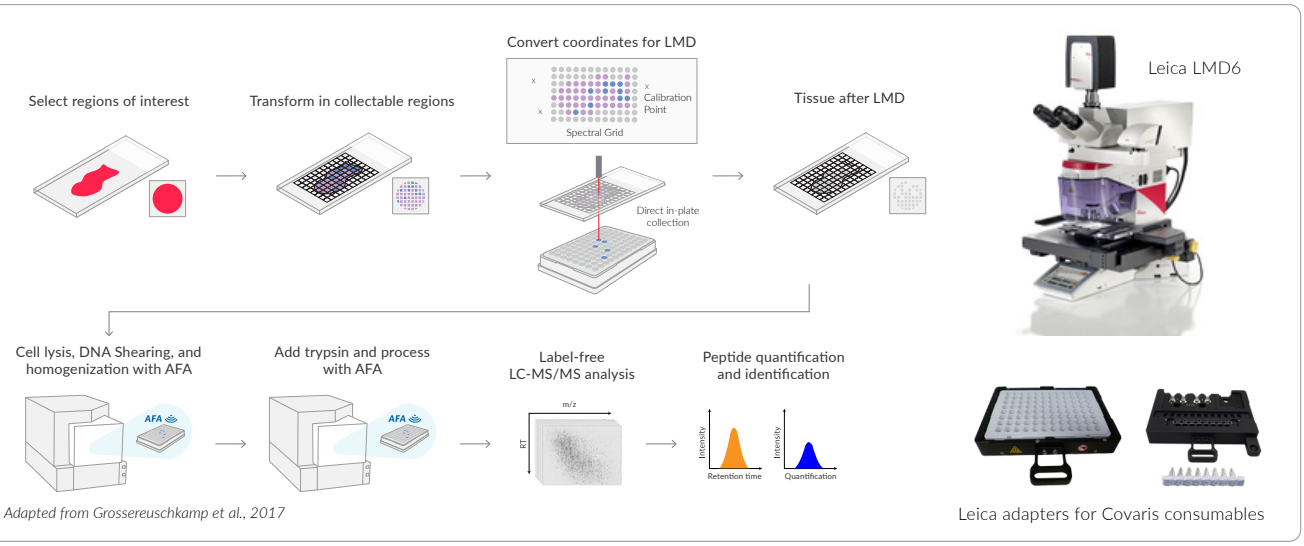
Scientific Relevance

Fixed tissues (e.g. with Formalin or OCT) display a valuable depository of clinically relevant primary samples, whether they are embedded in paraffin (FFPE) [1] or fresh. These samples provide great information to elucidate proteome changes during different scenarios such as treatment response, disease courses, remission etc. Laser capture microdissection (LCM) [2] allows to go down to single cell level enabling fine mapping of the underlying biological processes, which is key to better characterize malignant transformations such as cancer. However, the degree of information retrieved from a precious clinical sample highly depends on the robustness and reproducibility of the sample preparation process upfront many downstream analytical methods.

Challenges

- Once the regions of interest have been defined, collection can be time consuming and challenging
- The processing volumes must be low for good recovery with minimal sample loss
- Numerous steps are involved, increasing the risk of sample loss, contamination and handling mistakes in manual steps

Workflow



Adapted from Grossereuschkamp et al., 2017

Leica adapters for Covaris consumables

Advantages of Covaris Workflow

- Direct dispensing in Covaris AFA consumables (plates or strip) using Leica LMD6 or LMD7
- Compatible with any downstream analytical method: LC-MS, RPPA, multiplex antibody detection, aptamer-based detection
- Single pot processing, compatible with any clean-up (SP3, S-Trap [3], PreOmics iST, Thermo EasyPEP…)
- Fully automatable (check Application Note M020151) with 96 or 384-well plates

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
- Leica holder PN 11103285 (96-well plate) or 11505305 (8-well strip)

References

1. Schweitzer et al., AFA-sonication Followed by Modified Protein Aggregation Capture (APAC) Enables Direct, Reproducible and Non-toxic Sample Preparation of FFPE Tissue for Mass Spectrometry based Proteomics. Covaris Applicatio n Note M020141
2. Herrera et al., Laser capture microdissection coupled mass spectrometry (LCM-MS) for spatially resolved analysis of formalin-fixed and stained human lung tissues. Clin Proteom (2020) 17:24 DOI: 10.1186/s12014-020-09287-6
3. Marchione et al., HYPERsol: High-Quality Data from Archival FFPE Tissue for Clinical Proteomics, J. Proteome Res. 2020, 19, 2, 973–983 doi: 10.1021/acs.jproteome.9b00686

Stay Connected!

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 | M020153_RevA_Mar2021 | 2021© Covaris, Inc.