Robust Sample Preparation for Label-free or Tandem Mass Tag (TMT) LC-MS with Adaptive Focused Acoustics® (AFA®)

**Scientific Relevance**
Data quality is significantly impacted by the efficiency, reproducibility and reliability of sample preparation workflows. Proteomics analytical methods require robust, reproducible and streamlined protocols using precise instruments and high quality reagents.

**Challenges**
- Efficient and reproducible lysis
- Hands-on time/number of steps
- Sample viscosity

**Workflow**

<table>
<thead>
<tr>
<th>Traditional</th>
<th>AFA-EasyPep Mini MS Sample Prep</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lysis</strong></td>
<td>0.2</td>
</tr>
<tr>
<td><strong>Reduction</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Alkylation</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Protein clean-up</strong></td>
<td>15</td>
</tr>
<tr>
<td><strong>Protein digestion</strong></td>
<td>15</td>
</tr>
<tr>
<td><strong>Peptide clean-up</strong></td>
<td>0.2</td>
</tr>
</tbody>
</table>

**Advantages of the Covaris Workflow**
- Adaptive Focused Acoustic treatment is compatible with challenging samples (fresh tissues [1], LCM [2], FFPE scrolls [3]), and efficiently restores sensitive proteins (phosphoproteins, membrane proteins) [4,5]
- Established protocols are available and automatable in 8-Strip, 96-well and 384-well plates
- Compatible with TMT labeling

**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
- Thermo Scientific™ EasyPep™ Mini MS Sample Prep Kit PN A40006
- Thermo Scientific™ Orbitrap Tribrid Fusion Lumos™

**References**
3. 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 Application Note M020141
5. A paired liver biopsy and plasma proteomics study reveals circulating biomarkers for alcohol-related liver disease, Niu et al., bioRxiv 2020- DOI: 10.1101/2020.06.17.156455

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