

Nucleic Acid Extraction from Laser-Capture Microdissected (LCM) FFPE Tissues

Scientific Relevance

- Formalin-fixed, paraffin-embedded (FFPE) tissue is a widely used method for long-term clinical sample storage, but it comes with significant drawbacks due to the harsh nature of this method
- Researchers are increasingly realizing the importance of investigating subpopulations of cells within homogeneous tissue and the cross-talk between these cells, especially for tumor cells and their surrounding stroma
- Laser-Capture Microdissection (LCM) can be used on FFPE tissues and enables researchers to target and collect subsets of cells for DNA and RNA analysis by examining the tissue structure through microscopy

Challenges

- FFPE tissues are often precious, especially as they become increasingly used for Next-Generation Sequencing (NGS) in clinical environments
- Due to the small size of LCM samples, it is often difficult to extract nucleic acids of sufficient quantity and quality for downstream applications such as NGS

Workflow

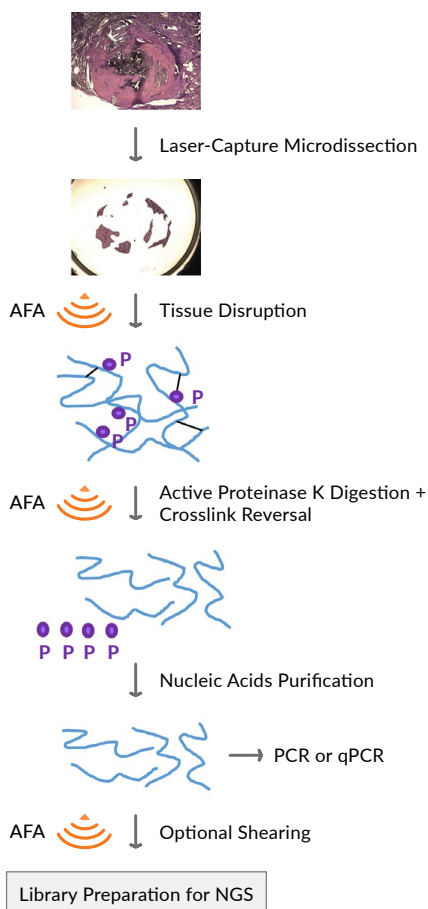


Fig 1: Schematic representation of the LCM-FFPE extraction workflow with Covaris truXTRAC® FFPE kits and Focused-ultrasonicators.

Advantages of Adaptive Focused Acoustics® (AFA®)

[AFA technology](#) enables high-efficiency extraction of nucleic acids from FFPE tissues.

- Efficient extraction of high-quality nucleic acids from FFPE tissues that can be used in PCR, qPCR, and NGS ^{1,2}
- Reduced QNS rates with even the smallest inputs
- Longer RNA fragments with high DV₂₀₀ scores, enabling detection of rare fusion events
- Simultaneous RNA and DNA extraction from the same FFPE tissue

Suggested Covaris Products

- [Covaris Focused-ultrasonicator](#) (M-Series, S-Series, E-Series, or LE-Series)
- [truXTRAC FFPE Kits](#)

Citations

1. [Amini et al. An optimized protocol for isolation of RNA from small sections of laser-capture microdissected FFPE tissue amenable for next-generation sequencing. BMC Mol Biol. \(2017\)](#)
2. [Kresse et al. Evaluation of commercial DNA and RNA extraction methods for high-throughput sequencing of FFPE samples. PLOS One. \(2018\)](#)