Scientific Relevance

- Tumor-sequencing studies have demonstrated that most cancers are driven by either single-nucleotide variants (SNV) or structural variants (SV). ¹
- Shallow Whole Genome Sequencing (sWGS), also known as Low Coverage (LC) WGS, allows researchers to determine SV with 0.1 to 0.2X low sequencing coverage.
- Low cost sWGS is emerging as a promising clinical sequencing strategy for SV-driven tumors. ¹
- sWGS can be used for clinically relevant structural variants such as oncogenic amplification, tumor-suppressor deletion, and genomic instability. ²
- sWGS can be applied to DNA originating from Formalin-Fixed Paraffin-Embedded tissue (FFPE), blood, or cfDNA. ⁴

Challenges

- Protocol requires library construction from DNA of different qualities and origins. ⁵
- Uniform coverage of the genome is challenging to obtain due to bias in sequencing technology. ⁵

Workflow

- AFA (Adaptive Focused Acoustics) technology is the gold standard for mechanical DNA shearing.
  - Highly reproducible results
  - Unbiased fragmentation regardless of GC content
  - Compatible with all DNA inputs, quality, and origin, including FFPE samples
  - Automation friendly options (LE220R-plus paired with AFA-TUBE consumables)

Suggested Covaris Products

- Covaris Focused-ultrasonicator (M-Series, S-Series, E-Series, or LE-Series)
- 96 AFA-TUBE TPX Plate (PN 520272)
- 8 AFA-TUBE TPX Strip (PN 520275)
- truXTRAC FFPE
- truXTRAC cfDNA (PN 520221)

Advantages of Adaptive Focused Acoustics® (AFA®)

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Citations