Covaris cryoPREP® with AFA: Enabling High-resolution Diagnostic Metagenomics

Scientific Relevance

- High resolution diagnostic metagenomics via reliable identification of known and newly emerging pathogens enable:
  1. Timely medical intervention for treatment
  2. Rapid human and livestock vaccine development pipeline
  3. More efficient food safety monitoring, and recall process

Challenges

- Need of an efficient and reproducible sample preparation workflow for standardizing pathogen-independent metagenomics for human and animal health, and food safety
- Nucleic acids are often encapsulated within host tissues within lymph nodes, robust cell and cyst walls or bacterial spores
- Diagnostic metagenomics require efficient and reproducible sample disruption without the risk of carry-over and cross contamination of samples

Workflow

Advantages of Covaris cryoPREP

cryoPREP provides a fast, tuneable, efficient, reproducible, and contact-free sample pulverization.
- Compared to other methods, such as bead-beating, cryoPREP provides the most reliable and gentle technique for nucleic acid extraction from various sample inputs
- cryoPREP allows nucleic acid extraction from complex samples enclosed in lymph nodes, cell/cyst walls or bacterial endospores
- Contact-free and closed processing avoids potential cross contamination of samples and release of pathogens
- Cryofracturization with controlled mechanical force ensures efficient and reproducible sample disruption

Advantages of Adaptive Focused Acoustics (AFA)

Supporting nucleic acid extraction with AFA improves yield especially when starting from scarce samples such as biopsy punches

Suggested Covaris Products

- CP02 cryoPREP Automated Dry Pulverizer
- tissueTUBE
- Focused-ultrasonicators

Citations


Image References

- https://schooltutoring.com/help/a-basic-overview-of-the-4-types-of-human-tissue/