FastPrep® Systems

Streamlining Everyday Workflows in Forensic Applications

- Thorough Grinding of Difficult Samples in Seconds
- High Yields
- Highly Reproducible
- Eliminate Cross-Contamination
Streamlining Everyday Workflows in Forensic Applications

FastPrep® Systems for sample preparation are a unique combination of powerful instruments for lysis and homogenization, sample-specific lysing matrix tubes, and optimized chemistry for the isolation of DNA, RNA, proteins, metabolites and other small molecules. The multidirectional, simultaneous beating of specialized matrix material thoroughly grinds notoriously tough evidentiary samples such as bone, teeth, hair and skin.

FastPrep instruments are so powerful that bodily fluids dried to solid matrices, such as fabrics, cigarette butts, and condoms can be placed directly in the lysing matrix tubes and processed without prior separation from the substrate. FastPrep instruments can also directly process bodily fluids collected with common sampling swabs, filters, or tongue depressors. FastPrep is the ultimate sample prep tool for applications such as DNA profiling, toxicology, and forensic pathology.

- Thorough Grinding of Difficult Samples in Seconds
- High Yields
- Highly Reproducible
- Eliminate Cross-Contamination
- Scalable with Optional Adapters

Proteomic Identification of Body Fluid/Cell Type

**Method**

1. Sample: fabric, wood, plastic beverage bottle or condom containing dried blood, saliva or semen
2. Add ~0.5 cm² sample to 2 mL Lysing Matrix D tube with 300 μL buffer
3. Process with FastPrep-24 homogenizer at 6.0 m/s for 30 sec at RT
4. Centrifuge at 20,000 x g for 10 min and carefully remove supernatant

**Results/Analysis**

Supernatant-extracted biologically active proteins of high-quality were obtained, sufficient for subsequent Bradford quantitation, purification by SDS-PAGE, HPnLC, IEF and identification by MALDI TOF-TOF.

**Reference:**
FastPrep Instruments, Lysing Matrix Tubes and Kits for Forensic Applications

Find your optimal solution for grinding any forensic sample

- Powerful Instruments for Thorough Lysis
- Consistent, Reproducible Results with Precise Settings
- Flexible Formats for Scalability
- Cryogenic Lysis Capability
- Widest Variety of Sample-Specific Matrices
- Complete Isolation Kits Available
- Compatible with Your Own Methods

<table>
<thead>
<tr>
<th>Instruments</th>
<th>Description</th>
<th>Pack Size</th>
<th>Cat. No.</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>FastPrep-24™ 5G instrument</td>
<td>Sample preparation instrument</td>
<td>Each</td>
<td>116005500</td>
<td>0.5-50 mL</td>
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<tr>
<td>FastPrep-96™ instrument</td>
<td>HT sample preparation instrument</td>
<td>Each</td>
<td>116010500</td>
<td>96 well-0.5 L</td>
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<tr>
<td>Super FastPrep-2™ instrument</td>
<td>Portable sample preparation instrument</td>
<td>Each</td>
<td>116012500</td>
<td>2 x 2 mL</td>
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<table>
<thead>
<tr>
<th>Adapters</th>
<th>Description</th>
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<tr>
<td>CoolPrep™ Adapter</td>
<td>Cryogenic sample holder</td>
<td>Each</td>
<td>116002528</td>
<td>24 x 2 mL</td>
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<tr>
<td>TeenPrep™ Adapter</td>
<td>Large volume sample holder</td>
<td>Each</td>
<td>116002526</td>
<td>12 x 15 mL</td>
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<tr>
<td>BigPrep™ Adapter</td>
<td>Large volume sample holder</td>
<td>Each</td>
<td>116002525</td>
<td>2 x 50 mL</td>
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<table>
<thead>
<tr>
<th>Lysing Matrix</th>
<th>Description</th>
<th>Pack Size</th>
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<th>Format</th>
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</thead>
<tbody>
<tr>
<td>Lysing Matrix A</td>
<td>¼” ceramic sphere + garnet lysing tube</td>
<td>100 tubes</td>
<td>116910100</td>
<td>2 mL</td>
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<tr>
<td>Lysing Matrix D</td>
<td>1.4 mm ceramic beads lysing tube</td>
<td>100 tubes</td>
<td>116913100</td>
<td>2 mL</td>
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<tr>
<td>Lysing Matrix S</td>
<td>¼” stainless steel beads lysing tube</td>
<td>50 tubes</td>
<td>116938050</td>
<td>15 mL</td>
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<tr>
<td>Metal Lysing Matrix Tube</td>
<td>Stainless steel grinding ball</td>
<td>3 tubes</td>
<td>116991003</td>
<td>2 mL</td>
</tr>
<tr>
<td>Metal Lysing Matrix Tube</td>
<td>Stainless steel grinding cylinder</td>
<td>3 tubes</td>
<td>116992003</td>
<td>2 mL</td>
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</table>

<table>
<thead>
<tr>
<th>Isolation/Extraction Kits</th>
<th>Description</th>
<th>Pack Size</th>
<th>Cat. No.</th>
<th>Format</th>
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<tbody>
<tr>
<td>FastDNA™ SPIN Kit</td>
<td>DNA isolation kit for FastPrep method</td>
<td>100 preps</td>
<td>116540600</td>
<td>2 mL</td>
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<tr>
<td>FastDNA™ SPIN Kit for Soil</td>
<td>DNA isolation kit for FastPrep method</td>
<td>50 preps</td>
<td>116560200</td>
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<tr>
<td>FastRNA™ Pro Green Kit</td>
<td>RNA isolation kit for FastPrep method</td>
<td>50 preps</td>
<td>116045050</td>
<td>2 mL</td>
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<tr>
<td>GENECLEAN Ancient DNA Kit</td>
<td>DNA isolation from ancient samples</td>
<td>100 preps</td>
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<td>2 mL</td>
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CASE STUDY

Hair

A Rapid Extraction Method for Alcohol Markers from Hair Samples.

Jayne Hazon, Richard Poulton, John Sullivan, Alistair Derrick
Alere Toxicology Plc. 2015.

Introduction

The 2014 Society of Hair Testing (SoHT) consensus has highlighted EtG as the first choice marker for abstinence assessment and also for proving chronic excessive alcohol consumption in child custody cases. Currently EtG samples are incubated in a sonication bath overnight to extract the analytes from the hair samples, meaning that turnaround time is significantly increased compared to other assays within the laboratory.

Overview

- **Keywords**: Hair grinding, EtG extraction, toxicology, GC-MS
- **Aim of the study**: Ethyl Glucuronide extraction from hair samples
- **Application**: LC-MS/MS
- **Sample name**: Hair
- **Material**: FastPrep-24™ instrument, steel and/or ceramic banded beads
- **Buffer**: Deionized water

Protocol and Parameters

1. Cut 75 mg of hair samples into 3-6 cm sections
2. Put the cut hair samples into 2 mL tubes containing steel and/or ceramic beads
3. Add deionized water
4. Load the tubes in a FastPrep-24™ instrument and process 2 x 1 min at speed setting of 6.0 m/s
The use of a Fastprep-24™ benchtop homogenizer reduced the extraction time for Ethyl Glucuronide (EtG) from overnight to just 40 seconds in hair samples.

Grinding hair samples with the FastPrep-24™ system has a clear advantage over simply cutting hair in terms of EtG recovery.

The added cost of consumables and equipment is mitigated by the dramatic reduction in extraction time and improvement in extraction recovery.

Further, it was observed that the FastPrep-24™ system provided more effective results for downstream applications, with up to 114% improved EtG recovery over a Sonicator.
Retrospective Monitoring of Long-Term Recreational and Dependent Cocaine Use in Toenail Clippings/Scrapings as an Alternative to Hair.


Overview

- **Keywords**: Abstinence, nails, contamination, LC–MS/MS, norcocaine, cocaine, cocaethylene, benzylecgonine
- **Aim of the study**: Retrospective monitoring of cocaine consumption of recreational and dependent users
- **Application**: Cocaine and metabolite analysis by LC-MS/MS
- **Sample name**: Toenails
- **Material**: FastPrep-24™ Homogenizer, 2 mL Lysing Matrix S tubes containing metal beads

Protocol and Parameters

1. Wash nail clippings twice with 1 mL of water and acetone, respectively, by vortexing for 30s.
2. Cut into snippets and weigh approximately 5 mg into Lysing Matrix Tubes containing metal beads for pulverization at 5.5 m/s (8-times for 60 s) using a FastPrep-24™ homogenizer.

Conclusion

The FastPrep-24 instrument and Lysing Matrix tubes offer a quick and efficient solution for grinding nail clippings for retrospective monitoring of cocaine consumption/abstinence.
Dirty Samples? No Problem.

FastDNA™ SPIN Kit for Soil

Efficiently isolate genomic DNA from soil or other environmental samples in under an hour!

Learn more at mpbio.com/sampleprep