

FastPrep® Systems

Streamlining Everyday Workflows in Forensic Applications

- Thorough Grinding of Difficult Samples in Seconds
- High Yields
- Highly Reproducible
- Eliminate Cross-Contamination



FastPrep® Systems Forensic Applications Overview

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:

Prinz, M et al. Establishment of a Fast and Accurate Proteomic Method for Body Fluid/Cell Type Identification. *Final Report*, NIJ Grant 2008-DN-BX-K011



FastPrep Instruments, Lysing Matrix Tubes and Kits for Forensic Applications

Find your optimal solution for grinding any forensic sample

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

Instruments				
Product Name	Description	Pack Size	Cat. No.	Format
FastPrep-24™ 5G instrument	Sample preparation instrument	Each	116005500	0.5-50 mL
FastPrep-96™ instrument	HT sample preparation instrument	Each	116010500	96 well-0.5 L
Super FastPrep-2™ instrument	Portable sample preparation instrument	Each	116012500	2 x 2 mL
Adapters				
Product Name	Description	Pack Size	Cat. No.	Format
CoolPrep™ Adapter	Cryogenic sample holder	Each	116002528	24 x 2 mL
TeenPrep™ Adapter	Large volume sample holder	Each	116002526	12 x 15 mL
BigPrep™ Adapter	Large volume sample holder	Each	116002525	2 x 50 mL
Lysing Matrix				
Product Name	Description	Pack Size	Cat. No.	Format
Lysing Matrix A	¼" ceramic sphere + garnet lysing tube	100 tubes	116910100	2 mL
Lysing Matrix D	1.4 mm ceramic beads lysing tube	100 tubes	116913100	2 mL
Lysing Matrix S	¼" stainless steel beads lysing tube	50 tubes	116938050	15 mL
Metal Lysing Matrix Tube	Stainless steel grinding ball	3 tubes	116991003	2 mL
Metal Lysing Matrix Tube	Stainless steel grinding cylinder	3 tubes	116992003	2 mL
Isolation/Extraction Kits				
Product Name	Description	Pack Size	Cat. No.	Format
FastDNA™ SPIN Kit	DNA isolation kit for FastPrep method	100 preps	116540600	2 mL
FastDNA™ SPIN Kit for Soil	DNA isolation kit for FastPrep method	50 preps	116560200	2 mL
FastRNA™ Pro Green Kit	RNA isolation kit for FastPrep method	50 preps	116045050	2 mL
GENECLEAN Ancient DNA Kit	DNA isolation from ancient samples	100 preps	111002200	2 mL

A Rapid Extraction Method for Alcohol Markers from Hair Samples.

Hair

CASE STUDY

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

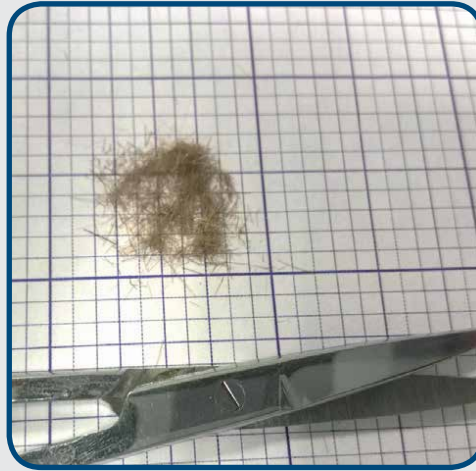
Protocol and Parameters

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

CASE STUDY

Results

More effective results for downstream applications

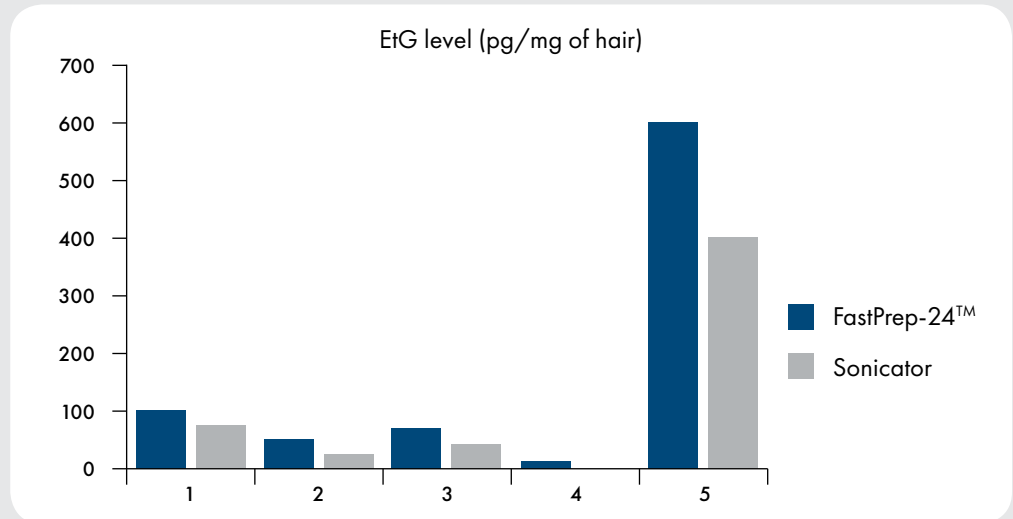


Standard Method (Chopped Hair)



Ground Hair

Up to 114% improved EtG Recovery over a Sonicator!



Conclusion

- 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.

Retrospective Monitoring of Long-Term Recreational and Dependent Cocaine Use in Toenail Clippings/Scrapings as an Alternative to Hair.

Toenails

CASE STUDY

Madry, M; Steuer, A.; Vonmoos, M.; Quednow, B.; Baumgartner, M; Kraemer, T. *Bioanalysis*. 2014, 6.

Overview

- **Keywords:** Abstinence, nails, contamination, LC-MS/MS, norcocaine, cocaine, cocaethylene, benzoylecgonine
- **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.



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Dirty Samples? No Problem.

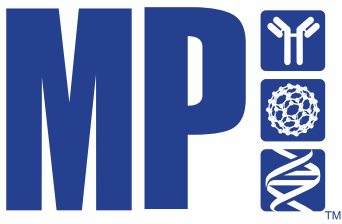
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