Rapid and Reliable Ultimate System for Sample Homogenization and Extraction of DNA, RNA and Proteins

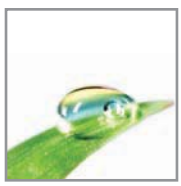
FastPrep® System

Homogenizer

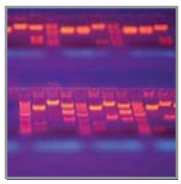
A Wide Panel of Adapters

Lysing Matrix Tubes

Purification Kits



Multiple Applications



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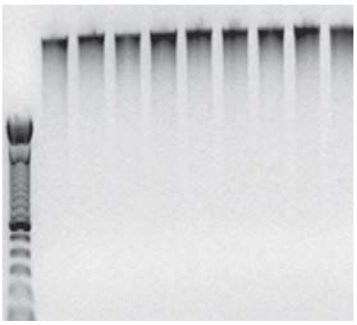
MP™

FastPrep®-24 Instrument
Ultra Rapid And Thorough Homogenization

Lyse Any Tough Or Frozen Sample In 40 Seconds



Genomic DNA from human ovarian tissue lysed with the FastPrep®-24 for 20 sec. *Courtesy of Dr. David Smith, Oncotech Inc.*

MP Biomedicals has introduced the FastPrep-24 Instrument, a new high-throughput model of the popular BIO 101 Systems FastPrep homogenizer offering a unique means by which virtually any type of sample, no matter how difficult, can be quickly and consistently lysed within 40 seconds.

The FastPrep-24 Instrument uses a unique, optimized motion to disrupt cells through the multidirectional, simultaneous beating of specialized Lysing Matrix beads on the sample material and is designed to homogenize up to 24 samples in 2ml tubes, or with additional purchase of optional adapters, 48 samples in 2ml tubes, 12 samples in 15ml tubes or 2 samples in 50ml tubes.

Developed for difficult and resistant samples, the FastPrep-24 Instrument lyses thoroughly and quickly any tissues and cells and thus allows easy and reproducible isolation of stable RNA, active proteins and full-length genomic DNA.

A completely self-contained system, the FastPrep-24 Instrument eliminates the risk of cross-contamination and time consuming clean-up associated with manual lysis methods.

Samples and buffers are simply added to a Lysing Matrix tube containing specialized Lysing Matrix beads. The ergonomic design of the instrument ensures easy loading of the sample tubes that remain securely sealed during the processing. The homogenization speed and duration times are digitally controlled. After setting your speed and time with the touch of a button, just push “run”, and in less than a minute your samples are completely lysed!

The vertical angular motion of the FastPrep-24 Instrument causes the lysing matrix particles to impact the sample from all directions simultaneously, releasing nucleic acids and proteins into the protective buffer. After centrifugation, the supernatant is collected for further purification process.

When compared to traditional homogenization methods such as vortexing, syringe shearing, grinding with a mortar and pestle or hammering samples that have been frozen in liquid nitrogen, the FastPrep-24 homogenizer will save hours of work during the sample preparation stage and will provide higher yields of intact DNA, RNA and proteins.

A wide variety of specialized Lysing Matrix tubes containing beads of different materials, sizes and shapes have been tailored to guarantee a thorough homogenization of samples from diverse sources including bacteria, yeast, fungi, botanical samples, insects, mammalian tissues and cultured cells.

High performance FastPrep purification kits used in conjunction with the FastPrep-24 Instrument provide ready-to-use methods for the release and subsequent purification of intact DNA, RNA, and proteins from virtually any source.

FastDNA Kits quickly and efficiently isolate genomic DNA with a silica-based Geneclean procedure. Eluted DNA is ready for digestion, electrophoresis, PCR and any other desired application.

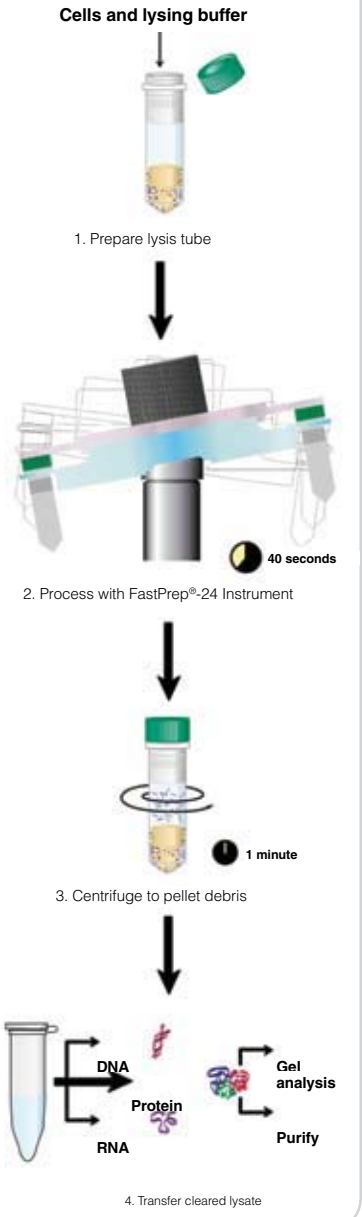
The single-reagent extraction method of the FastRNA Pro Kits safely releases total RNA into the proprietary RNApro Solution where it is instantly stabilized. RNA in RNApro Solution is extracted with chloroform and precipitated with ethanol. The resulting high quality RNA is ready for downstream applications including RT-PCR and Northern analysis.

FastProtein Matrices offer the fastest way to release expressed proteins from the host organism and are perfect for analyzing protein expression conditions using gel analysis.

FastPrep®-24
Sample Preparation System

Most Advanced, Rapid And Thorough Extraction Of DNA, RNA And Proteins

Overview of the FastPrep®-24 Procedure



- *Homogenizes Resistant Samples with Ease*
- *Processes 24x2ml; 48x2ml; 12x15ml; or 2x50ml Samples with Interchangeable Adapters*
- *Delivers High Reproducibility due to Precise Setting of Lysis Time and Speed*
- *Eliminates Cross Contamination with Single-use Matrix Tubes*
- *Completes Sample Preparation for Extraction and Purification of DNA, RNA and Proteins with Available FastPrep Kits*

LYSE EFFICIENTLY

- Bone, brain, tumors
- Bacteria gram + or –
- Yeast, fungi, spores
- Seeds,roots
- Feces, soil

Lysing Matrix A tube

- ***Optimized Lysing Matrix and Complete Extraction Kits for any Type of Sample***
- ***Retain the Integrity and Size of DNA, RNA and Proteins***
- ***Ergonomic Loading System***

Cat. #	Description
6003-500	FastPrep®-24 Instrument

Lyse BIG and FAST with Interchangeable Adapters!

QuickPrep™ Adapter
24 x 2 ml samples
(included with FastPrep®-24 Instrument)

New

CryoPrep ™ Adapter
24 x 2 ml samples
under temperature-controlled conditions

TeenPrep™ Adapter
12 x 15ml samples

HiPrep™ Adapter
48 x 2ml samples

BigPrep™ Adapter
2 x 50 ml samples

The ergonomic design of FastPrep®-24 optional adapters ensures easy loading of Lysing Matrix tubes that remain securely sealed during homogenization. All the adapters stand stable on the benchtop and are commonly used as tube racks for sample storage at -20°C or-80°C. Frozen Lysing Matrix tubes loaded in the adapters are ready to be processed in the FastPrep®-24 with minimal hands-on manipulation.

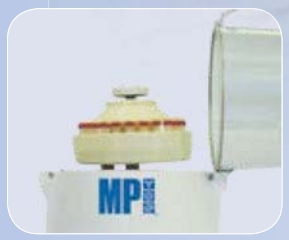
Cat. #	Description
6002-512	QuickPrep™ Adapter
6002-525	BigPrep™ Adapter
6002-526	TeenPrep™ Adapter
6002-527	HiPrep™ Adapter
6002-528	CryoPrep™ Adapter

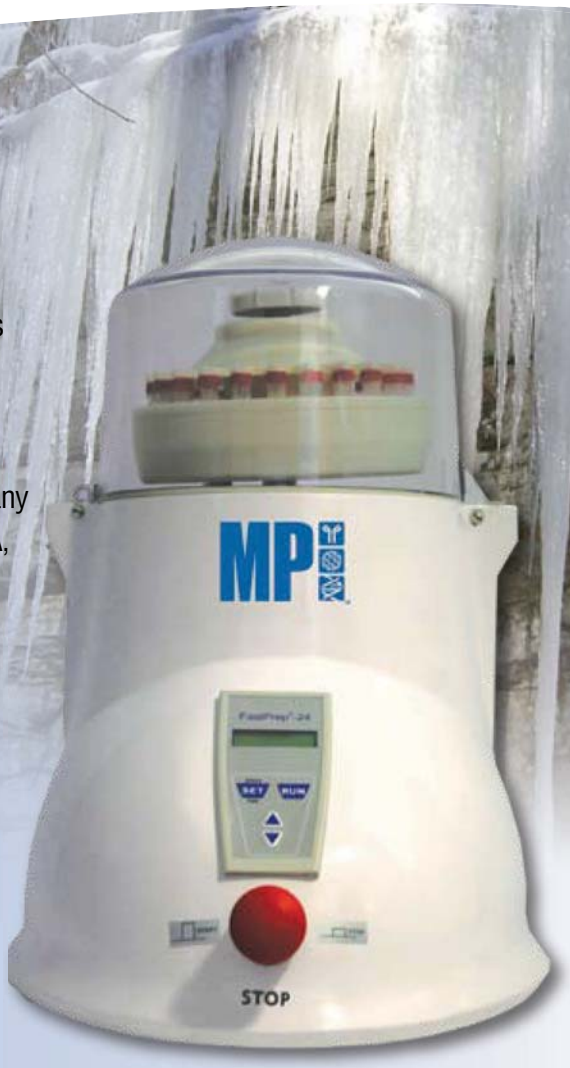
Cryogenic Sample Lysis for Extraction of Temperature Sensitive Compounds

CryoPrep™

24 x 2ml Tubes Adapter equipped with a Temperature-Controlling System

CryoPrep™ is a novel FastPrep®-24 adapter, which allows simultaneous cryogenic lysis of 24 x 2ml samples. Based on passive temperature control technology, the CryoPrep adapter ensures an efficient cooling of the samples as dry-ice, placed into the moving tray is in direct contact with the sample tubes. Due to a high heat transfer capacity and Fastprep® precise settings of lysis parameters, the samples can be repeatably homogenized with no increase in temperature. This new adapter is ideally suited for extractions of any temperature unstable or sensitive biological compounds such as RNA, siRNA, metabolites, intermediates, and enzymes from even the hardest samples to lyse. Most samples can be processed in 40 seconds or less.





The FastPrep® System: a proven technology with more than 6,000 users worldwide

Cat. #	Description
6002-528	CryoPrep™ Adapter

Sample Preparation for High Throughput Applications

HiPrep™

48 x 2ml Tubes Adapter

New 48 x 2ml tubes adapter for FastPrep-24 instrument, effectively doubles its capacity, and your throughput.

Ideally suited for high throughput and pharmacological research on extracted DNA, RNA, proteins, enzymes, cell components and small molecules/metabolites. Lyse a variety of samples including cells, microorganisms, spores, soils, sediments, feces, forensic samples, food samples, plant and animal tissues, bones, polymers, inorganic materials, pharmaceutical products and many more.

Cat. #	Description
6002-527	HiPrep™ Adapter

Large Volume Sample Preparation

TeenPrep™

12 x 15ml Tubes Adapter

- Efficiently lyse in 40 seconds or less:
  Cell cultures, bacteria, yeast, spores, animal and plant tissues, bones, swabs, soil, sediments, feces, forensic samples, food samples, polymers, etc…
- Ideally suited for:
  RNA, Proteins, Enzymes Isolation; Natural Products Isolation; Environmental Science; Forensic Science; Food Safety and Quality Analysis; Biopharma manufacturing and many more…
- Lyse up to 12 samples in convenient 15ml centrifuge tubes
- Reproducible and accurate lysis due to precise speed and time settings
- Never worry about cross-contamination
- Easy to clean and decontaminate
- Compatible with SafTest™ Food Inspection System

Ergonomic loading system

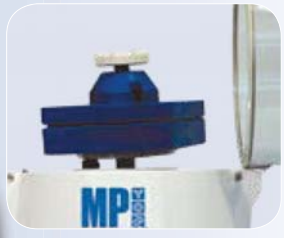
Cat. #	Description
6002-526	TeenPrep™ Adapter

Extra-Large Sample preparation

BigPrep™

2 x 50ml Tubes Adapter

- *Simultaneously homogenize two large samples*
- *Efficiently lyse in 40 seconds or less:*
  Cell cultures, bacteria, yeast, spores, animal and plant tissues, bones, swabs, soil, sediments, feces, forensic samples, food samples, polymers, etc...
- *Ideally suited for:*
  DNA and RNA Isolation
  Enzyme Isolation and Protein Production
  Natural Products Isolation
  Food Preparation for Safety and Quality Analysis
  Biopharma Manufacturing
  And many more
- *No cross-contamination*
- *Easy to clean and decontaminate*
- *Supersized proven FastPrep® technology*
- *Compatible with SafTest™ Food Testing System*
- *Optimized ready-to-use 50 ml Lysing Matrix Tubes for any sample available*
- *Ergonomic loading system*



The FastPrep® System: a proven technology with more than 6,000 users worldwide

Cat. #	Description
6002-525	BigPrep™ Adapter

Convenient Lysing Matrix Tubes for Every Need

MP Biomedicals guarantees the BEST performance from your FastPrep®-24 Instrument when used in combination with FastPrep Lysing Matrix Tubes

Matrices are critical components of the FastPrep® Sample Preparation system.

Matrices are available separately for use with your own unique buffers, and are also available as components of the complete purification kits on the following pages.

New Easy Dispenser Box for all Matrix Kits of 100 and 500 Tubes

Cat. #	Description	Pack size
6910-050	Lysing Matrix A	50 x 2 ml Tubes
6910-100	Lysing Matrix A	100 x 2 ml Tubes
6910-500	Lysing Matrix A	500 x 2 ml Tubes
6911-050	Lysing Matrix B	50 x 2 ml Tubes
6911-100	Lysing Matrix B	100 x 2 ml Tubes
6911-500	Lysing Matrix B	500 x 2 ml Tubes
6912-050	Lysing Matrix C	50 x 2 ml Tubes
6912-100	Lysing Matrix C	100 x 2 ml Tubes
6912-500	Lysing Matrix C	500 x 2 ml Tubes
6913-050	Lysing Matrix D	50 x 2 ml Tubes
6913-100	Lysing Matrix D	100 x 2 ml Tubes
6913-500	Lysing Matrix D	500 x 2 ml Tubes
6914-050	Lysing Matrix E	50 x 2 ml Tubes
6914-100	Lysing Matrix E	100 x 2 ml Tubes
6914-500	Lysing Matrix E	500 x 2 ml Tubes
6750-200	BioPulverizer™ System I (10 tubes each of 6910-6914)	50 x 2 ml Tubes

Lysing Matrix A

Each impact-resistant 2 ml tube contains garnet matrix and one 1/4 inch ceramic sphere. Extra 1/4 inch ceramic spheres are packaged separately. Lysing Matrix A tubes have orange caps and are found in the FastDNA® and FastDNA® SPIN Kits. Lysing Matrix A is used for all sample types except soil for the subsequent isolation of genomic DNA.

Lysing Matrix B

Each impact-resistant 2 ml tube contains 0.1 mm silica spheres. Lysing Matrix B tubes have blue caps and are found in the FastRNA® Pro Blue Kit and FastProtein™ Blue Matrix. Lysing Matrix B is used for lysis of gram positive and gram negative bacteria.

Lysing Matrix C

Each impact-resistant 2 ml tube contains 1 mm silica spheres.Lysing Matrix C tubes have red caps and are found in the FastRNA Pro Red Kit and FastProtein Red Matrix. Lysing Matrix C is used for lysis of yeast and fungi.

Lysing Matrix D

Each impact-resistant 2 ml tube contains 1.4 mm ceramic spheres. Lysing Matrix D tubes have green caps and are found in the FastRNA® Pro Green Kit for isolation of total RNA from plants and animals.

Lysing Matrix E

Each impact-resistant 2 ml tube contains 1.4 ceramic spheres, 0.1 mm silica spheres, and one 4 mm glass bead. Lysing Matrix E tubes have purple caps and found in the FastDNA® SPIN Kit for Soil and the FastRNA®Pro Soil Kits.

50ml Lysing Matrix Tubes

Cat. #	Description	Pack size
6950-010	BigA - Lysing Matrix Tubes	10 x 50ml Tubes
6950-050	BigA - Lysing Matrix Tubes	50 x 50ml Tubes
6951-010	BigB - Lysing Matrix Tubes	10 x 50ml Tubes
6951-050	BigB - Lysing Matrix Tubes	50 x 50ml Tubes
6953-010	BigD - Lysing Matrix Tubes	10 x 50ml Tubes
6953-050	BigD - Lysing Matrix Tubes	50 x 50ml Tubes
6960-010	BigClean - Lysing Matrix Tubes with stainless steel beads	10 x 50ml Tubes
6960-050	BigClean - Lysing Matrix Tubes with stainless steel beads	50 x 50ml Tubes
6954-010	Big E-Lysing Matrix Tubes	10 x 50ml Tubes
6954-050	Big E-Lysing Matrix Tubes	50 x 50ml Tubes

15ml Lysing Matrix Tubes

Cat. #	Description	Pack size
6930-050	TeenA - Lysing Matrix Tubes	50 x 15ml Tubes
6931-050	TeenB - Lysing Matrix Tubes	50 x 15ml Tubes
6932-050	TeenC - Lysing Matrix Tubes	50 x 15ml Tubes
6933-050	TeenD - Lysing Matrix Tubes	50 x 15ml Tubes
6934-050	TeenE - Lysing Matrix Tubes	50 x 15ml Tubes

Ready-to-use Protocols for DNA, RNA and Protein Isolation from Any Sample!

A Wide Range of FastPrep® Kits

- Rapid and reproducible sample lysis and purification process
- No cross contamination with closed lysing matrix tubes
- Increased yields of high quality DNA, RNA and Proteins
- Integrity and size of DNA, RNA and Proteins are retained
- Nucleic acids and Proteins are ready-to-use in down stream applications

FastDNA® Spin Kit for Soil

Cat N° 6560-200 (50 preps)

- Variety of soil and environmental sample types
- No hazardous organic reagents required
- SPIN filters streamline silica handling

FastProtein™ Blue Matrix

Cat N° 6550-400 (50 preps) - Cat N° 6550-500 (100 preps)

- Release of proteins from gram positive and gram negative bacteria in 40 seconds
- Protein extracts are ready for immediate electrophoresis or purification
- Ideal for optimizing induction conditions

FastDNA® Kit
FastDNA® Spin Kit

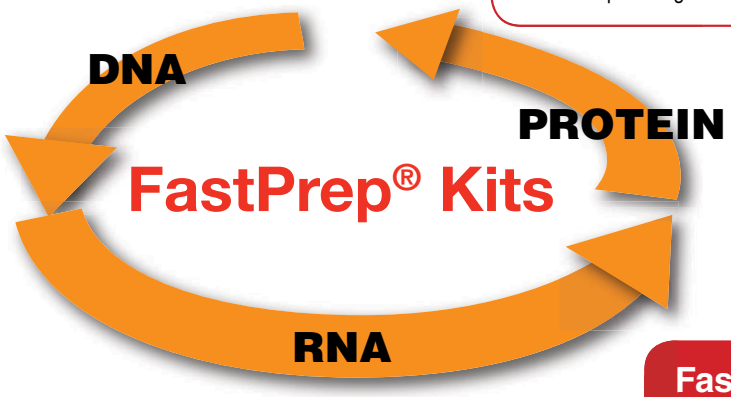
Cat N° 6540-400 - Cat N° 6540-600 respectively (100 preps)

- Plant, animal, yeast, fungal and microbial samples
- No hazardous organic reagents required
- SPIN filters streamline silica handling (FastDNA Spin Kit)

FastProtein™ Red Matrix

Cat N° 6550-600 (50 preps) - Cat N° 6550-700 (100 preps)

- Release of proteins from yeast cells and fungi in 40 seconds
- Protein extracts are ready for immediate electrophoresis or purification
- Ideal for optimizing induction conditions



FastRNA® Pro Red Kit

Cat N° 6035-050 (50 preps)

- For use with yeast cells and fungal tissue
- Lyse up to 10^{10} cells per 2ml tube

FastRNA® Pro Soil-Direct Kit
FastRNA® Pro Soil-Indirect Kit

Cat N° 6070-050 - Cat N° 6075-050 respectively (50 preps)

- Variety of soil and environmental sample types
- RNA protected during and after processing
- Humic acids reduced to allow uninhibited RT-PCR
- Includes additional reagents for even further purification if necessary
- SPIN filters streamline silica handling

FastRNA® Pro Green Kit

Cat N° 6045-050 (50 preps)

- For use with all plant and animal samples
- Lyse 50-100 mg tissue per 2ml tube

FastRNA® Pro Blue Kit

Cat N° 6025-050 (50 preps)

- For use with gram positive and gram negative bacteria
- Lyse up to 10^{10} cells per 2ml tube

FastDNA® SPIN Kit

A Rapid Method of Isolating Pure Genomic DNA from a Wide Variety of Sources!

- ***Rapid and reproducible sample lysis with the FastPrep®-24 or FastPrep® FP120 Instrument***
- ***Isolate PCR-ready DNA from a variety of sample types***
- ***No hazardous organic reagents are required***

The FastDNA® SPIN Kit quickly and efficiently isolates genomic DNA from almost any sample (plant and animal tissues, cultured cells, bacteria, yeast, fungi, insects, etc). Up to 200 mg of tissue or cells are processed by the FastPrep®-24 or FastPrep® FP120 with the Lysing Matrix A tubes. The kit includes 3 different chaotropic buffers for the homogenization of a wide variety of sample types and the released DNA is purified by a silica-based spin filter method. Purified DNA is ready for enzyme digestion, electrophoresis, PCR and any other desired application.

References
1. Hill J.E. et al (2005). Appl.Environ.Microbiol. Vol 71 : 867-875
2. Moon H. et al (2004). J.Exp.Bot. Vol 55 : 1519-1528
3. Dionisi H.M. et al (2004). Appl.Envir.Microbiol. Vol 70 : 3988-3995

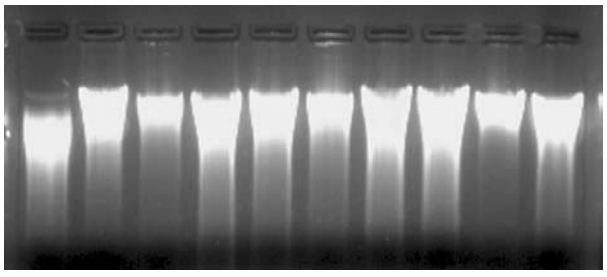
Cat #	Designation	Pack Size
6540-600	FastDNA® SPIN Kit	100 Preps

FastDNA® SPIN Kit For Soil

Isolate Pure DNA from Cells present in Soil or other Environmental Samples!

- ***Rapid and reproducible sample lysis with the FastPrep®24 or FastPrep® FP120 Instrument***
- ***Easily isolate DNA from a variety of organisms in many different types of soil***
- ***No hazardous organic reagents are required***

The FastDNA® SPIN Kit for Soil is designed to efficiently isolate bacterial, fungi, plant and animal genomic DNA from soil and environmental samples. Up to 500 mg soil are processed by the FastPrep®-24 or FastPrep® FP120 with the Lysing Matrix E tubes designed to efficiently lyse all microorganisms including difficult sources such as eubacterial spores and endospores, gram positive bacteria and yeast. The released DNA is purified by a silica-based spin filter method and is suitable for PCR analysis and other downstream applications.



DNA from various soil samples extracted with the FastDNA® SPIN Kit for Soil.
20% of the DNA isolated from 500mg soil was loaded on a 1.2% agarose gel (0.5X TAE).
Soil was taken from: Lane 1: tomato pot; Lane 2 : sludge;
Lane 3 : sandy soil; Lane 4 : under pine tree;
Lane 5 : under palm tree; Lane 6 : green garden;
Lane 7 : Nile Lilly pot; Lane 8 : lawn grass;
Lane 9 : citrus tree; Lane 10 : avocado tree. DNA ranges from 4-20 kb.

References
1. Selesi D. et al (2005). Appl. Envir. Microbiol. Vol 71 : 175-184
2. Alexandrino M. et al (2004). Water Research. Vol 38 : 1340 - 1346
3. Mumy K.L. et al (2004). J. of Microbiological Methods. Vol 57 : 259 – 268

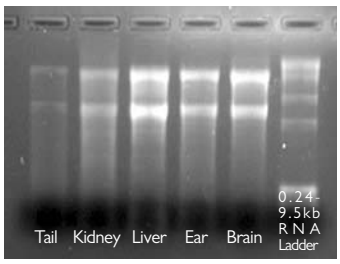
Cat #	Designation	Pack Size
6560-200	FastDNA® SPIN Kit for Soil	50 Preps

FastRNA® Pro Kits

Isolate High Quality Total RNA with a Single-Reagent Extraction Method!

- ***Rapid and reproducible sample lysis in under 40 seconds with the FastPrep®24 or FastPrep® FP120 Instrument***
- ***Safe and consistent RNA isolation with the single-reagent RNAPro™ solution***
- ***Lysis and purification of total RNA***

The FastRNA® Pro Kits are designed to quickly and efficiently isolate total RNA from virtually any sample. During the homogenization step, intact total RNA is released in the proprietary RNAPro™ solution where it is immediately stabilized. The RNAPro™ solution inactivates cellular RNases during cell lysis to prevent RNA degradation. RNA is then extracted with chloroform and precipitated with ethanol. DEPC-treated water is provided for resuspension of total RNA. High quality RNA prepared with FastRNA® Pro Kits is ready for all downstream applications including RT-PCR, gene expression and microarray analysis.



Rat total RNA extracted with the FastRNA® Pro Green Kit. Approximatively 2% of the total RNA isolated from 100 mg frozen tissue was loaded on to a 1.2% denaturing agarose gel (1X MOPS).

Cat #	Designation	Pack Size
6025-050	FastRNA® Pro Blue Kit (bacteria)	50 Preps
6035-050	FastRNA® Pro Red Kit (yeast and fungi)	50 Preps
6045-050	FastRNA® Pro Green Kit (plants andanimals)	50 Preps

References
1. Vido K. et al (2005). J. Bacteriol. Vol 187 : 601-610
2. Tsai H.F. et al (2004). Antimicrob. Agents Chemoth. Vol 48 : 2483 – 2489
3. Tupin E. et al (2004). J. Exp. Med. Vol 199 : 417 -422

FastRNA® Pro Soil Kits

Isolate Total RNA From Soil that is Immediately Ready for RT-PCR and other Downstream Applications!

- ***Rapid and reproducible sample lysis in under 40 seconds with the FastPrep®-24 or FastPrep® FP120 Instrument***
- ***Easily lyse difficult gram positive cells, plant material, and organic debris directly from soil***
- ***Lysis and purification solutions protect RNA during processing***
- ***Humic acids levels reduced to allow uninhibited RT-PCR***
- ***Lysis and purification of total RNA***

The FastRNA® Pro Soil-Direct and Indirect kits are designed to efficiently isolate total RNA from organic material found in soil samples or soil supernatants.

The direct method consists of extracting nucleic acid from microorganisms and other biological specimens directly from soil. The indirect method utilizes an initial separation of microorganisms and other biological specimens from the soil followed by lysis of the organisms and RNA purification. This method also permits soil incubation with growth media in order to amplify under-represented living organisms prior to RNA isolation if specific comparisons of microbial diversity are not desired. FastRNA Pro® Soil kits purify RNA in a process that removes humic substances and other inhibitors,and efficiently inactivates cellular RNases during homogenization to prevent RNA degradation. Purified RNA is thus suitable for RT-PCR analysis and other downstream applications.

Cat #	Designation	Pack Size
6070-050	FastRNA® Pro Soil-Direct Kit	50 Preps
6075-050	FastRNA® Pro Soil-Indirect Kit	50 Preps

Easy Lysis of Microorganisms to Release Recombinant Proteins

FastProtein™ Matrix

- Save time by reducing sample lysis time to seconds
- Quickly and consistently lyse samples from different time points or induction conditions
- Protein extract is ready for immediate electrophoresis or purification

Prepare dozens of protein samples in minutes!
The FastProtein™ products employ a powerful, patented technology for the rapid lysis of yeast and bacteria. Used in conjunction with the FastPrep®-24 or FastPrep® FP120 Instrument, these products offer the fastest way to release expressed proteins from the host organism.
FastProtein™ Kits are perfect for analyzing protein expression conditions using gel analysis. Samples are enclosed during the quick lysis step, thus preventing cross-contamination or sample loss.

Bacteria

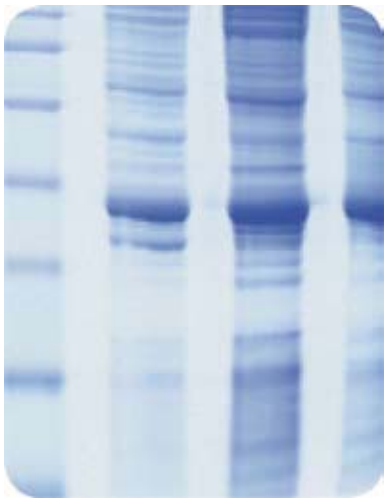


Figure 1
12% SDS PAGE of lysate of BL21 cells expressing the GST protein resulting from homogenization with the FastProtein™ Blue Matrix

Yeast

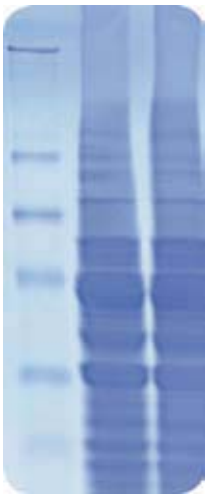


Figure 2
12% SDS PAGE of lysate of yeast cells resulting from homogenization with FastProtein™ Red .

Cat. #	Description	Size
6550-400	FastProtein™ Blue Matrix	50 x 2ml
6550-500	FastProtein™ Blue Matrix	100 x 2ml
6550-600	FastProtein™Red Matrix	50 x 2ml
6550-700	FastProtein™Red Matrix	100 x 2ml

FastProtein™ Blue
For Lysis Of Gram Positive And Gram Negative Bacteria

The FastProtein™ Blue matrix is optimal for lysing gram positive and gram negative bacteria. These fine glass beads are designed for use with gram positive bacteria or any difficult microorganism. Cells, resuspended in either 1X PBS or your own expression buffer, are added to the Lysing Matrix and processed in the FastPrep®-24 or FastPrep® FP120 for 20–40 seconds.

FastProtein™ Red
For Lysis Of Yeast Cells

The FastProtein™ Red matrix is used to lyse yeast cells. Cells, resuspended in either Yeast Breaking Buffer (YBB-supplied with the kit) or your own expression buffer, are added to the small glass beads of this Lysing Matrix and processed in the FastPrep®-24 or FastPrep® FP120 Instrument for 20–40 seconds.

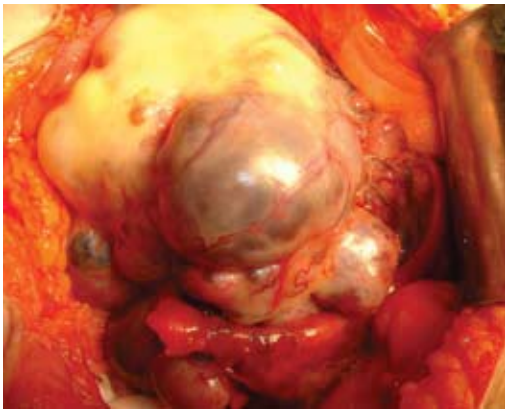
Table of Typical FastPrep® Systems Settings for Optimal Sample Lysis

Sample Name	Sample Type	Quantity	Lysing Matrix	FastPrep® speed	FastPrep® time
HUMAN AND ANIMAL					
Human	Lung	50 mg	Lysing Matrix D	6.0	4x 30 sec.
Human	Breast	80 mg	Lysing Matrix D	6.0	2x 30 sec.
Human	Kidney	50 mg	Lysing Matrix D	6.0	40 sec.
Human	Thyroid Tumors	100 mg	Lysing Matrix A	6.0	3x 30 sec.
Mouse	Eye	10 mg	Lysing Matrix D	6.0	4x 30 sec.
Mouse	Heart	70 mg	Lysing Matrix D	6.0	4x 30 sec.
Mouse	Kidney	50 mg	Lysing Matrix D	6.0	40 sec.
Mouse	Femur	40 mg	Lysing Matrix A	6.0	4x 30 sec.
Mouse	Leg Muscle	50 mg	Lysing Matrix D	6.0	40 sec.
Mouse	Intestine	50 mg	Lysing Matrix D	6.0	40 sec.
Mouse	Ear	45 mg	Lysing Matrix D	6.0	4x 30 sec.
Mouse	Tail	100 mg	Lysing Matrix A	6.0	4x 30 sec.
Mouse	Spleen	70 mg	Lysing Matrix D	6.0	40 sec.
Mouse	Lung	50 mg	Lysing Matrix D	6.0	40 sec.
Mouse	Liver	50 mg	Lysing Matrix D	6.0	40 sec.
Mouse	Brain	50 mg	Lysing Matrix D	6.0	40 sec.
Mouse	Pancreatic cells (bHC9)	10^7 cells	Lysing Matrix D	6.0	40 sec.
PLANT					
Alpowa Wheat	Leaf Tissue	75 mg	Lysing Matrix D	6.0	40 sec.
Alpowa Wheat	Seed	100 mg	Lysing Matrix A	6.0	40 sec.
Arabidopsis thaliana	Fresh Leaves	50 mg	Lysing Matrix D	6.0	40 sec.
Arabidopsis thaliana	Fresh Leaves	200 mg	Lysing Matrix D	6.0	2x 40 sec.
Bartlett Pear	Leaf Tissue	50 mg	Lysing Matrix D	6.0	40 sec.
Classic Oat	Leaf Tissue	75 mg	Lysing Matrix D	6.0	40 sec.
Classic Oat	Seed	100 mg	Lysing Matrix A	6.0	40 sec.
Corn	Leaf Tissue	100 mg	Lysing Matrix D	6.0	40 sec.
Crest Barley	Leaf Tissue	100 mg	Lysing Matrix D	6.0	40 sec.
Crest Barley	Root	300 mg	Lysing Matrix A	6.0	40 sec.
Kaybonnet Rice	Leaf Tissue	100 mg	Lysing Matrix D	6.0	40 sec.
Kaybonnet Rice	Seed	100 mg	Lysing Matrix A	6.0	40 sec.
Klages Barley	Root	300 mg	Lysing Matrix A	6.0	40 sec.
Klages Barley 70 mg Leaf Tissue 6.0 40 seconds	Leaf Tissue	70 mg	Lysing Matrix D	6.0	40 sec.
Tobacco	Leaf Tissue	75 mg	Lysing Matrix D	6.0	40 sec.

Table of Typical FastPrep® Systems Settings (continued)

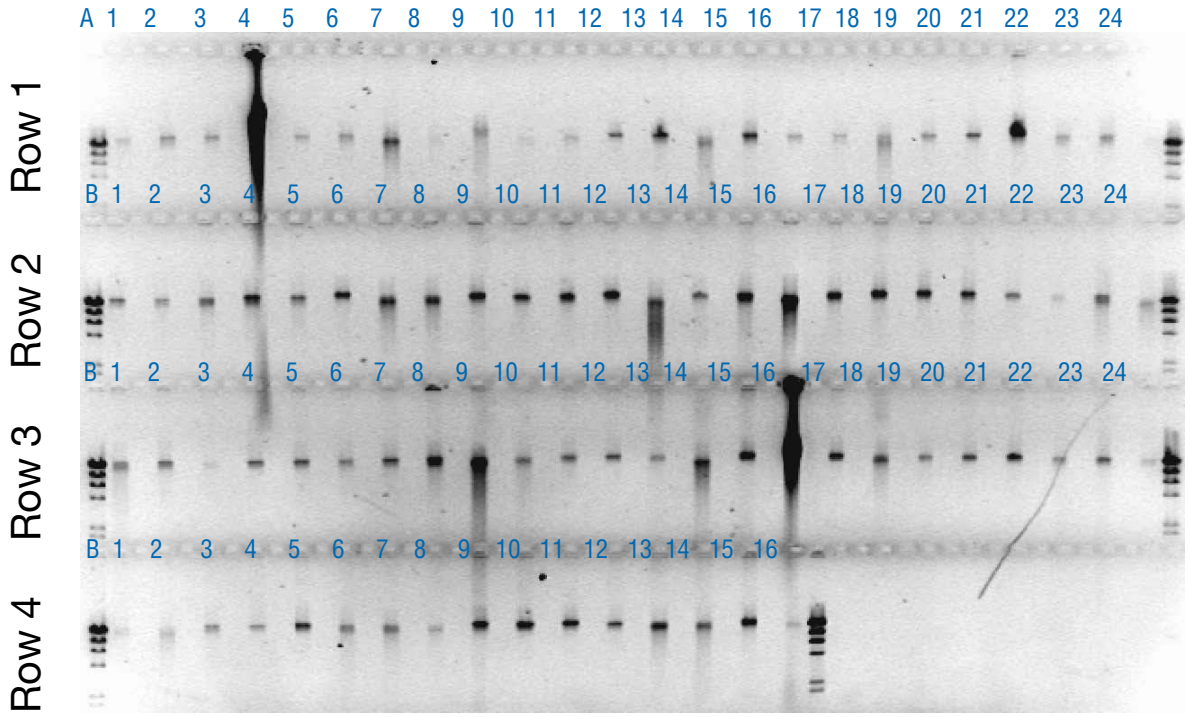
Sample Name	Sample Type	Quantity	Lysing Matrix	FastPrep® speed	FastPrep® time
PLANT					
Lafitte Rice	Leaf Tissue	75 mg	Lysing Matrix D	6.0	40 sec.
Lafitte Rice	Sprout Leaf	100 mg	Lysing Matrix D	6.0	2x 30 sec.
Soybean	Seed	100 mg	Lysing Matrix A	6.0	40 sec.
Corn	Seed	100 mg	Lysing Matrix A	6.0	40 sec.
Oat FL 502	Leaf Tissue	75 mg	Lysing Matrix D	6.0	40 sec.
Oat FL 502	Seed	100 mg	Lysing Matrix A	6.0	40 sec.
Riser Oat	Leaf Tissue	70 mg	Lysing Matrix D	6.0	40 sec.
Richland Soybean	Leaf Tissue	100 mg	Lysing Matrix D	6.0	40 sec.
Tam Wheat	Leaf Tissue	75 mg	Lysing Matrix D	6.0	40 sec.
Tam Wheat	Root	80 mg	Lysing Matrix A	6.0	40 sec.
Tomato, Early Girl	Leaf Tissue	75 mg	Lysing Matrix D	6.0	4 x 30 sec.
Williams 82 Soybean	Leaf Tissue	70 mg	Lysing Matrix D	6.0	40 sec.
Wrens Rye	Leaf Tissue	100 mg	Lysing Matrix D	6.0	40 sec.
Pine	Needle	100 mg	Lysing Matrix A	6.0	30 sec.
BACTERIA					
Listeria monocytogenes	Cells	10^9 cells	Lysing Matrix B	6.0	3x 30 sec.
Streptococcus pyogenes	Cells	10^9 cells	Lysing Matrix B	6.0	20 sec.
Streptococcus mutans	Cells	10^9 cells	Lysing Matrix B	6.0	30 sec.
Staphylococcus aureus	Cells	10^8 cells	Lysing Matrix B	6.0	2x 40 sec.
Photorhabdus luminescens	Cells	10^9 cells	Lysing Matrix B	6.0	2x 30 sec.
Escherischia coli	Cells	10^8 cells	Lysing Matrix B	6.0	30 sec.
Mycobacterium tuberculosis	Cells	10^8 cells	Lysing Matrix B	6.0	2x 45 sec.
Lactococcus lactis	Cells	10^8 cells	Lysing Matrix B	6.0	3x 30 sec.
YEAST AND FUNGI					
Saccharomyces cerevisiae	Cells	2x 10^8 cells	Lysing Matrix C	6.0	40 sec.
Schizosaccharomyces pombe	Cells	10^8 cells	Lysing Matrix C	5.0	4x 15 sec.
Candida albicans	Cells	10^8 cells	Lysing Matrix C	6.0	2x 30 sec.
Cryptococcus neoformans	Cells	10^8 cells	Lysing Matrix C	6.0	4x 30 sec.
Aspergillus fumigatus	Cells	10^8 cells	Lysing Matrix C	6.0	2x 30 sec.
Fusarium solani	Cells	10^8 cells	Lysing Matrix C	6.0	2x 30 sec.
ENVIRONMENTAL SAMPLES					
Sediments	Soil/rocks	50 mg	Lysing Matrix E	5.5	2x 30 sec.
Soil	Sandy sample	50 mg	Lysing Matrix E	4.0	4x 30 sec.
Soil	Litter	50 mg	Lysing Matrix E	5.5	30 sec.
Feces	Turd	300 mg	Lysing Matrix E	6.0	40 sec.

Example of Onco-Pathology Related Applications of FastPrep®-24 Sample Preparation of Biopsy Tissues for Genomic Analysis and Drug Resistance Screening



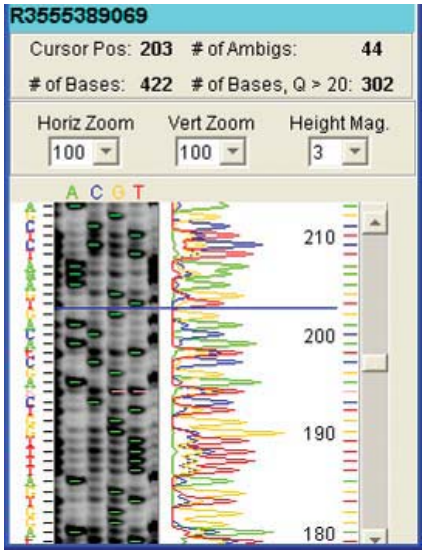
Human-derived biopsy specimens of primary and secondary tumors are usually complex matrices which are very hard to properly homogenize using the classical methods. Their mechanical consistencies vary widely. The FastPrep-24 System, with its unique disruption mechanism and accurate settings, allows for rapid, repeatable and reliable sample lysis and homogenization, and produces highest quality of functional genomic DNA, RNA and proteins for a variety of research, diagnostics and pharmacology applications.

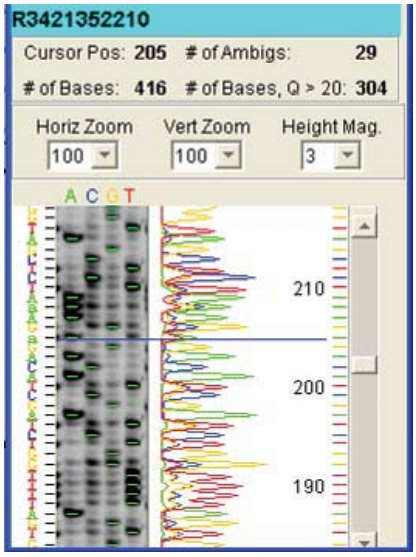
As an example of high-throughput screening, here are 85 genomic DNAs isolated from human ovary cancer tumor biopsies via the FastPrep-24, and automatically purified via the BioMEK3K robot. FastPrep® prepared lysate is directly compatible with third party high-throughput automation and automation kits

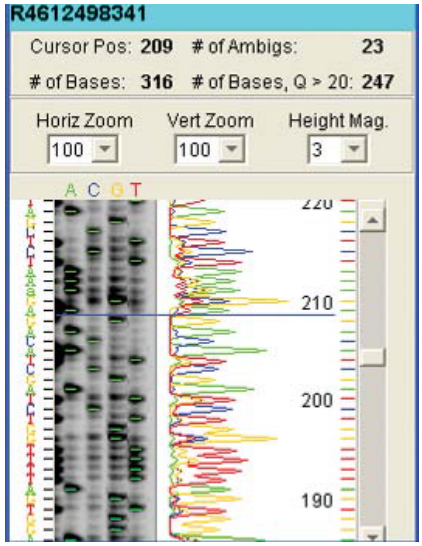


FastPrep-24® settings: 6.0 m/s for 40 seconds (one pass), using lysing matrix A

Sequencing of FastPrep® Isolated DNA

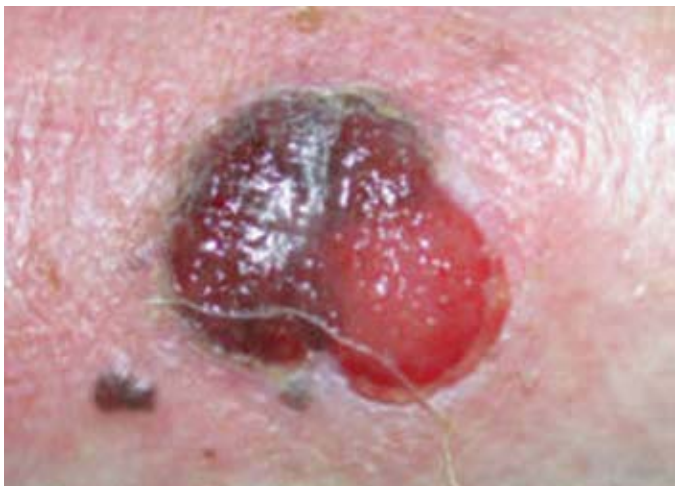




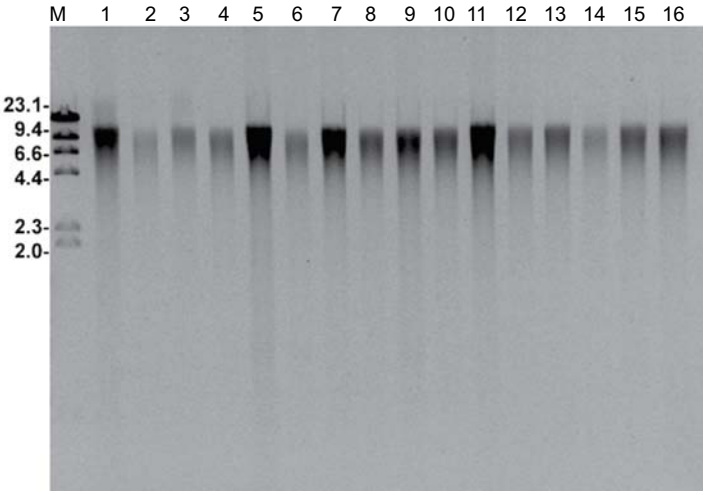


The FastPrep-Isolated DNA is Ready for High-Throughput Sequencing

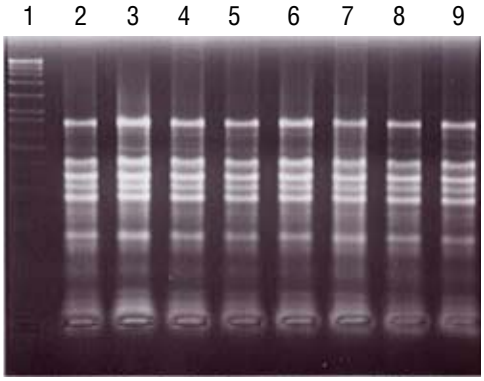
An example of the sequencing analysis of genomic DNA extracted using the FastPrep®-24 system from a single biopsy melanoma tissue. The target wild type sequence is GTGACA with a documented mutation at “T” (usually a tranversion to “A”). Note that the first panel is wild type, second panel is a mixture of wild type and mutant and the third panel is a pure mutant. Clear evidence for heterogeneity within a single biopsy specimen. The sequencing gels further demonstrate high quality of DNA extracted from FastPrep® systems generated lysates



Gel of gDNA isolated from melanoma specimens



RNA Extraction From Basil Leaves



Line 1. Marker
Line 2. 1x40sec. with FastPrep® FP120 Instrument
Line 3. 2x40sec. with FastPrep® FP120 Instrument
Line 4. 3x40sec.with FastPrep® FP120 Instrument
Line 5. 1x40sec. with FastPrep® 24 Instrument
Line 6. 2x40sec. with FastPrep® 24 Instrument
Line 7. 3x40sec. with FastPrep® 24 Instrument
Line 8. 1x40sec. with FastPrep® FP120 Instrument
Line 9. 1x40sec. with FastPrep® 24 Instrument

50mg of basil leaves were homogenized with the FastPrep®-24 or FastPrep® FP120 Instrument. One, two or three runs of 40 seconds were performed at a speed setting of 6.0 m/s and RNA was extracted with the FastRNA® Pro Green Kit.

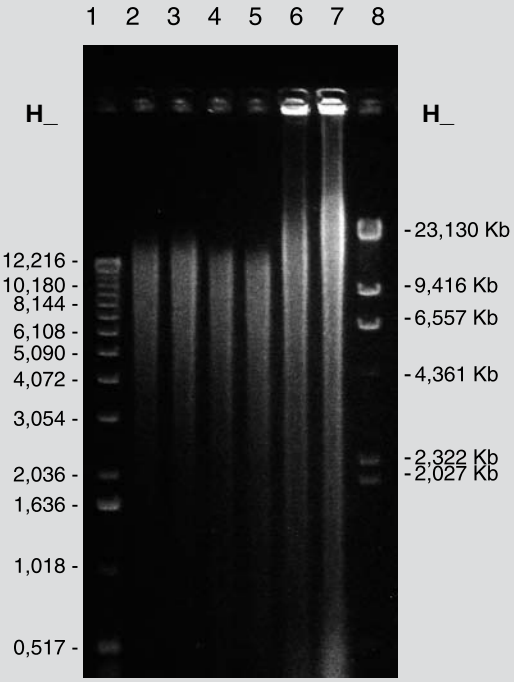
An Outstanding Rapid Method for the Isolation of Pure Genomic DNA!

DNA isolation with the FastDNA® SPIN kit

1. Add protective extraction buffer to Lysing Matrix Tube
2. Add sample and place in the FastPrep®-24 Instrument
3. Process for 30-40 seconds, remove
4. Centrifuge to pellet debris
5. Mix clear supernatant with GLASSMILK® (patented silica matrix)
6. Process through spin filter, wash and elute DNA

Eluted DNA is ready for enzyme digestion, electrophoresis, PCR and any other downstream application. The FastDNA® SPIN kit provides all the reagents required for the purification process including the lysing matrix tubes.

200 mg of plant leaves and mouse tails were homogenized in the FastPrep®-24 instrument for 40 seconds at a speed setting of 6.0 m/s. The FastPrep®-24 instrument uses a unique, optimized motion to homogenize samples by multidirectional, simultaneous impaction with lysing matrix particles.
After genomic DNA isolation according to the FastDNA® SPIN Kit protocol, DNA samples were analyzed by agarose gel electrophoresis (0.8% agarose gel stained with ethidium bromide).



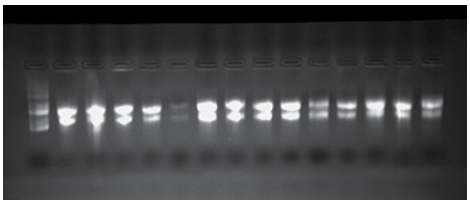
Line 1: Marker (1Kb DNA ladder)
Line 2 & 3: Soft plant leaf
Line 4 & 5: Thick, fibrous plant leaf
Line 6 & 7: Mouse tail
Line 8: Marker
(λ.DNA/HindIII fragments ladder)

RNA and SiRNA Isolation from Cassava Roots Using the FastPrep®-24 System

Cassava root (*Manihot esculenta*), a plant native of South America, is a major annual crop in tropical and subtropical regions. Its starchy tuberous root is a one of major sources of carbohydrates for human consumption, especially in Africa. Due to root complex matrix structure which results in strong and starchy mechanical properties sample homogenization and lysis of Cassava with classical methods is a cumbersome and unreliable process with small yield of RNA. Herein we demonstate successful lysis and RNA extraction from Cassava roots and leaves in only 60 seconds using the FastPrep-24® system and associated matrices.

RNA was extracted from Cassava roots after homogenization with the FastPrep-24 Instrument and Lysing Matrix A tubes containing 2 ceramic 1/4" beads

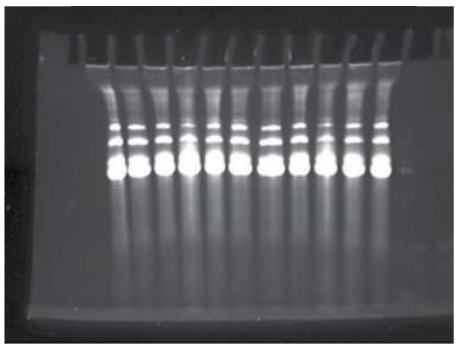
Cassava roots



RNA extraction from Cassava storage roots;
samples contain 0.32µg/µl-110µg/µl RNA
FastPrep® settings: Speed 6.0 for 60s
Lysing Matrix A with additional ceramic ¼" bead

Cassava Leaves

siRNA gel



RNA was extracted from Cassava leaves after homogenization with the FastPrep®-24 and Lysing Matrix A tubes. Total RNA was further processed for siRNA isolation using the gradient separation procedure

siRNA extraction from Cassava leaves;
Samples contain 1.5µg/µl-2.5µg/µl RNA
FastPrep® settings: Speed 6.0 for 30s
Lysing Matrix A

FastPrep®-24 Applications
Questions and Answers

Is it possible to isolate virus particles from animal tissues with the FastPrep®-24 System?

The FastPrep-24 System is designed for the isolation of viruses from animal and plant tissues. Researchers using the FastPrep®-24 instrument for this application reported that sample homogenization with Lysing Matrix A tubes (garnet sand and one ceramic bead) induce lysis of viruses together with the animal cells. When the garnet sand is removed and the homogenization process is performed with one ceramic bead, the animal cells are lysed after one run of 20 sec. at speed 6.5 m/s but not the viruses, meaning that the protein capsid is intact.
Reference: Klempa B. et al. (2005) J.Clin.Microbiol. Vol 43(6); 2756-2763.

Are there specific recommendations to prevent RNA degradation by RNases when isolating RNA with the FastRNA® Pro Kits?

The origin of RNA degradation is often action of RNases: both endogenous and exogenous RNases.

1. Inactivation of endogenous RNases

Endogenous RNases are released from cellular compartments immediately after harvesting tissue and cells. It is essential to inactivate these RNases as soon as possible to prevent RNA degradation.
To effectively inactivate endogenous RNases, add RNApro Solution (chaotropic-based cell lysis solution containing guanidium isothiocyanate) to each sample as soon as possible following sample harvest and homogenize immediately with the FastPrep®-24 instrument or flash-freeze samples in liquid nitrogen. To prevent RNA degradation, it is important that the tissue be cut in small enough (1cm) pieces to allow rapid, thorough freezing of the entire tissue.

2. Reduce exposure to exogenous RNases

To isolate intact, high quality RNA, it is essential that exogenous RNases are not introduced into purified RNA preparations. It is essential that any item that could contact the purified RNA is RNase-free. All surfaces, including pipettors, benchtops, glassware and gel equipment, should be decontaminated with a surface decontamination solution such as RNase Erase (Cat # 2440204). RNase-free tips, tubes, and solutions should always be used and gloves should be changed frequently.

What are the settings for yeast lysis with the BigPrep® Adapter ?

The FastPrep®-24 instrument in combination with the BigPrep® Adapter has been successfully used for the lysis of Pichia Pastoris, a yeast strain that has a big cell wall. After centrifugation of 1 liter culture (5x $10e^8$ cells/ml), the cell pellet is resuspended in 50 ml Lysis Buffer (containing protease inhibitors and PMSF). 25ml of this solution is added to 2 Big Lysing Matrix B tubes (containing silica beads) and samples are homogenized 4 times for 30 seconds at speed 6.0 m/s. Tubes were incubated on ice for 2 minutes between each run. 80% of yeast cells were lysed.

Is it possible to isolate RNA from paraffin-embedded tissues with the FastPrep®-24 System?

Tissue samples to be used in microscopic and histological analyses are often preserved by embedding in paraffin. However, the presence of paraffin may interfere with isolation of RNA. For isolation of RNA from paraffin-embedded tissues, we recommend removing the paraffin by xylene extraction before proceeding with the FastRNA® Pro procedure.

Materials:
- Xylene
- Ethanol (100%, 95%, 70% solutions)
- Distilled water
- Glass jars or other solvent containers (such as Coplin staining dish)

Procedure:
1. Section paraffin blocks at 5-10 microns

2. Place sections in a water bath at 42 °C to and eliminate any folds and wrinkles

3. Mount sections onto glass slides and let air dry overnight at room temperature. If sections do not adhere to the slides, they can be incubated at 42 °C for up to 8 hours.

4. Immerse the slides containing the tissue sections in solvents and solutions as follows:
   Xylene 5 minutes
   Xylene 5 minutes
   Ethanol, 100% 30 seconds
   Ethanol, 95% 30 seconds
   Ethanol, 70% 30 seconds,
   dH2O 30 seconds

Which settings are recommended for a successful homogenization of skin samples ?

20mg of full thickness skin samples are placed into Lysing Matrix A tubes containing 800µl extraction buffer. Samples are homogenized with the FastPrep®-24 instrument, 4 runs of 20 seconds are performed at speed 6.0 m/s. Samples are incubated on ice for 2 minutes between each run.

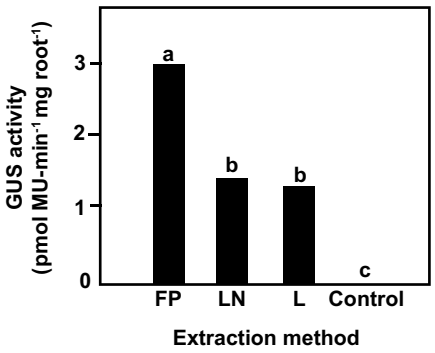
Are Lysing Matrix tubes resistant to solvents and is it possible to store them at -20°C or -80°C ?

Both tubes and lysing matrix beads are resistant to chemicals (acids, bases, solvents). All Lysing Matrix tubes can be stored in freezers at -20°C and -80°C

Is the FastPrep®-24 System designed for the isolation of enzymes? Is the enzymatic activity preserved?

The FastPrep® system is designed for the isolation of enzymes from any sample. To preserve enzymatic activity, it is recommended to use Lysing Matrix tubes with large beads like ¼" ceramic beads included in Lysing Matrix A tubes and to homogenize samples for short times with incubation on ice for at least 2 minutes between successive FastPrep® homogenizations in order to prevent overheating of the sample.

Bao J.R. et al. (Can.J.Plant Pathol. (2002), Vol 24: 340-348) used the FastPrep® System for the homogenization of tomato roots and isolation of GUS enzyme and demonstrated that this method is yielding the highest enzymatic activity compared to other grinding methods:
Abstract: Insertion of beta-D-glucuronidase (GUS) reporter gene has been found to be useful for detection, quantitation, and monitoring of plant-associated fungi in their environment. GUS was extracted from tomato roots inoculated with a nonpathogenic strain of Fusarium oxysporum, 70T01, that had been genetically modified to express both GUS activity and hygromycin B resistance. To facilitate studies of fungus–plant interactions using the GUS enzyme, we tested several methods for their efficiency of preparation of fungal-encoded GUS from infected plant tissues, namely FastPrep® homogenization, grinding of tissues frozen in liquid nitrogen, and extraction from lyophilized material. Of the three procedures, the FastPrep® method yielded the highest GUS activity per unit of inoculated root and provided twice the sensitivity of the other methods. This procedure was also the easiest, quickest, and the most reliable. Up to 12 samples could be analyzed in less than 2 h, and as little as 50 mg of fresh tissue was sufficient. Of the factors examined that could affect extraction efficiency, only the length of homogenization and the presence of protein stabilizers (sucrose, bovine serum albumin, and protease inhibitors) in the GUS buffer improved enzyme activity in the extracts. The FastPrep® method was also highly effective in enumerating fungal colony forming unit (CFU) populations in the root tissues, provided that the timing and speed of homogenization was controlled. Plating of infected root samples homogenized using the FastPrep® equipment and a mortar and pestle yielded about 50 times more CFUs per unit root than the colony counts obtained from whole roots, dried and powdered roots, or lyophilized roots.



Comparison of different extraction methods on fungal GUS enzyme activity recovered from tomato roots inoculated with a nonpathogenic strain of Fusarium oxysporum, 70T01, transformed with the GUS gene. Extraction methods included FastPrep (FP), liquid nitrogen, (LN), and lyophilization and FastPrep extraction (L). Extracts from noninoculated tomato using the FastPrep method served as controls. Bars withdifferent letters are significantly different (P < 0.05, Student– Newman–Keuls method, n = 14–15).

Is the FastPrep®-24 System designed for DNA extraction from Cryptosporidium oocysts?

There are three main problems associated with the isolation of DNA from Cryptosporidium organisms: (i) the extreme robustness of the oocysts (ii) the different physical and chemical nature of the matrices (faeces, water, food, soil) and their richness in PCR inhibitors (iii) the low number of oocysts usually present in environmental samples.

The reduction or removal of PCR inhibitors is an essential component in the molecular detection of Cryptosporidium in faecal and environmental samples. Currently, pathogen isolation by Immuno Magnetic Separation (IMS) and culture enrichment prior to DNA extraction are standard procedures to eliminate or reduce PCR inhibitors. These methods, however, become impractical for organisms that have no IMS procedures or that cannot be cultured. The use of IMS is also expensive, and this limits the use of samples mostly to single organism detection. Thus, the development of methods for direct extraction of PCR quality DNA is important for the detection of pathogens in environmental samples.

In a recently published study from Jiang J. et al. (Appl. Environ. Microbiol. (2005), Vol 71: 1135-1141), six DNA extraction methods for the detection of Cryptosporidium in water samples were evaluated. The authors concluded that direct DNA extraction with the FastDNA® SPIN kit for soil in combination with the use of a high concentration of BSA represents the most effective tool for PCR detection of Cryptosporidium oocysts in water samples. This reduces the cost of current PCR detection of Cryptosporidium oocysts in water samples significantly as there is no need for the expensive IMS of oocysts prior to DNA extraction. This method also enables the use of extracted DNA for the analysis of other pathogens.

Is it possible to extract DNA from feces with the FastPrep®-24 System?

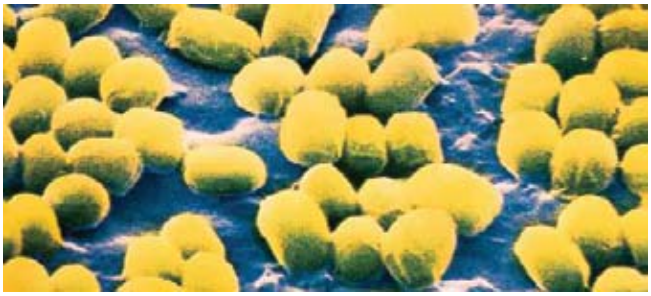
Several studies report the isolation of inhibitor-free DNA from feces with the FastPrep® System for analysis of their bacterial content.
Layton A. et al. (Appl.Environ.Microbiol. (2006), Vol 72: 4214-4224) and Ott S.J. et al. (J.Clin.Microbiol. (2004), Vol 42: 2566-2572) extracted DNA from human and animal feces with the FastDNA® SPIN Kit for Soil for real-time PCR assays and detection of bacterial species.
On the other side, Tannock G.W. et al. (Appl.Environ.Microbiol. (2000), Vol 66: 2578-2588) and Requena T. et al. (Appl.Environ.Microbiol. (2002), Vol 68:2420-2427) extracted DNA from 1ml human fecal sample with the FastDNA® Kit to monitor the composition of the fecal microflora by PCR-DGGE

Protocol for RNA extraction from murine corneas:

Corneas are excised from frozen eyes of mice, and RNA is prepared using the FastRNA® Pro Green kit. Each cornea is placed in 0.8 ml RNApro™ solution and homogenized with Lysing Matrix D in a FastPrep® instrument at setting 6.0 for 40 s. After cooling on ice, supernatants are transferred and the lysing matrices rinsed with 0.2 ml RNApro™ solution. Combined supernatants are chloroform-extracted, and RNA is precipitated from the upper phase with an equal volume of isopropanol overnight at -20 °C. Pellets are rinsed with 70% ethanol, air-dried, and resuspended in 10 µl DEPC-treated H2O at 55-60 °C for 10 min.

Reference: Berglund S.R. et al. (2007) J. Investigative Dermatology Vol 127; 349-353.

Is the FastPrep®-24 System suitable for lysis of spores?



Coloured scanning electron micrograph (SEM) of Bacillus anthracis spores

Bacterial and fungal spores either in culture or in environmental samples are successfully lysed with the FastPrep®-24 system.
Bacillus Subtilis spores in suspension in Lysing Matrix B tubes are processed 3 times for 40 seconds at speed 6.0 m/s with 1 minute cooling on ice between each run. 98% spore lysis was confirmed by microscopy.
Hudson K.D. et al. (J. Bacteriol. (2005), Vol 183: 4317-4322) isolated proteins from Bacillus Subtilis spores for Western Blotting and Keijser B.J.F. et al. (J. Bacteriol (2007), Vol 189: 3624-3634) purified RNA from cultures of Bacillus Subtilis spores with the FastRNA® Pro Blue Kit and used total RNA for reverse transcription, labelling and hybridization on micro-array slides.

Anthrax is one of the most dangerous zoonotic infectious disease and has been the first candidate for biological weaponry for over 80 years. It is very difficult to detect anthrax DNA from soil because of the presence of humic acid and many other nonsporulated and sporulated bacteria. DNA was extracted from 1 g of soil artificially contaminated with spores of Bacillus anthracis using a FastDNA® SPIN Kit for Soil. Results of nested and real-time PCR experiments indicates that one cell of B. anthracis in 1 g of soil is detected by this rapid and highly sensitive method. (Cheun H.I. et al. J.Appl. Microbiol. (2005) Vol 95: 728-733).

2 published studies from Roesti D.et al. (Appl. Environ. Microbiol (2005), Vol 71: 6673-6679) and Mincer T.J. et al. (Appl. Environ. Microbiol (2005), Vol 71: 7019-7028) describe the extraction of DNA from bacterial and fungal spores included in soil cores and marine sediments with the FastDNA® SPIN Kit for Soil. Purified DNA was used for seminested PCR, environmental library construction and DGGE analysis.

Is the FastPrep®-24 System designed for the homogenization of hair samples for forensic toxicology analysis?

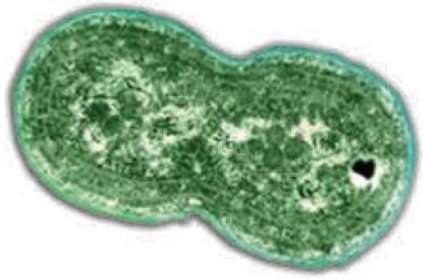
The FastPrep®-24 instrument combined with the TeenPrep™ adapter has been successfully used for the lysis of hair samples prior to drug analysis. Uncut hair samples are added to 15ml Lysing Matrix tubes containing 8 large 1/4 inch ceramic spheres and 4 steel beads, samples are homogenized 2 times for 50 seconds at speed 6.0 m/s. After the homogenization step, methanol is added to the powder-like homogenate for drug extraction.

Recommendations for the homogenization of small amounts of animal and plant tissues (less than 10mg)

The homogenization of sample amounts lower than 10mg is performed with Lysing Matrix D tubes after removal of half of the ceramic beads from the tubes. Samples are disrupted at a speed setting of 6.0 m/s for 30 second

Has the FastPrep®-24 System been tested for DNA isolation from blue-green algae?

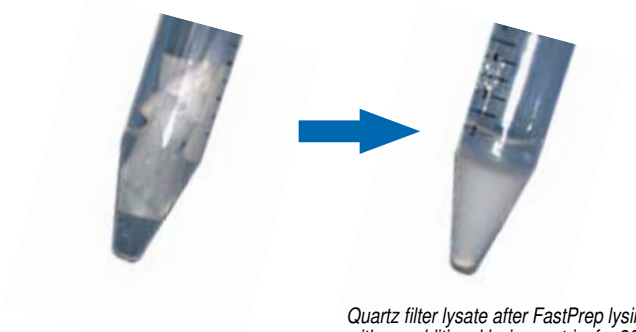
Blue-green algae also called cyanobacteria are successfully lysed by the FastPrep®-24 Instrument. 2 published studies from Crosbie N.D. et al. (Appl. Environ. Microbiol. (2003), Vol 69: 5716-5721) and Steward G.F. et al. (App. Environ. Microbiol. (2004), Vol 70: 1455-1465) report the lysis of cyanobacteria cells with the FastPrep® System for DNA extraction experiments.
Crosbie N.D. et al. extracted DNA from 10ml of Synechococcus and Cyanobium cultures using the FastDNA® Kit and the FastPrep® Instrument. DNA was used for PCR amplification. Steward G.F. et al. added cyanobacteria resuspended in a phenol-chloroform-isoamyl alcohol solution to Lysing Matrix B tubes (0.1mm silica beads). Samples were homogenized 2 times for 10 seconds at speed 6.0 m/s with the FastPrep® Instrument. Following phase separation and DNA precipitation with ethanol, DNA resuspended in TE buffer was used as template of nested-PCR assays.



Synechococcus cyanobacteria

How to use the FastPrep®-24 System for allergan extractions from air-filter ?

A rapid and thorough extraction of endotoxin from PM2.5 air filters has been developed at UCI by employing a high speed shaker (FastPrep®-24, MP Biomedicals, Solon, OH). Briefly, quartz filters were placed into endotoxin-free extraction vials containing pyrogen-free water and processed by the FastPrep instrument for 30 seconds at 6.5 m/s. Following shaking, the samples were put onto a tube rotator (Dynal Biotech) for 1 hour. An aliquot was assayed using a Limulus Amoebocyte Lysate (LAL) kinetic chromogenic assay (Pyrochrome Associates of Cape Cod, Falmouth, MA). In addition, a negative control filter (blank) was extracted and analyzed. A set of sixteen archived personal PM2.5 air filters were evaluated for the presence of endotoxin. We found detectable endotoxin concentrations in 14 filter extracts with a range of 0.03 - 5.5 EU/mL and a mean concentration of 0.73 EU/mL. The blank filter showed no detectable concentrations of endotoxin.



Quartz filter folded into the 15 ml tube in a TeenPrep adapter

Quartz filter lysate after FastPrep lysing with no additional lysing matrix, for 30 seconds at 6.5 m/s speed settings

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