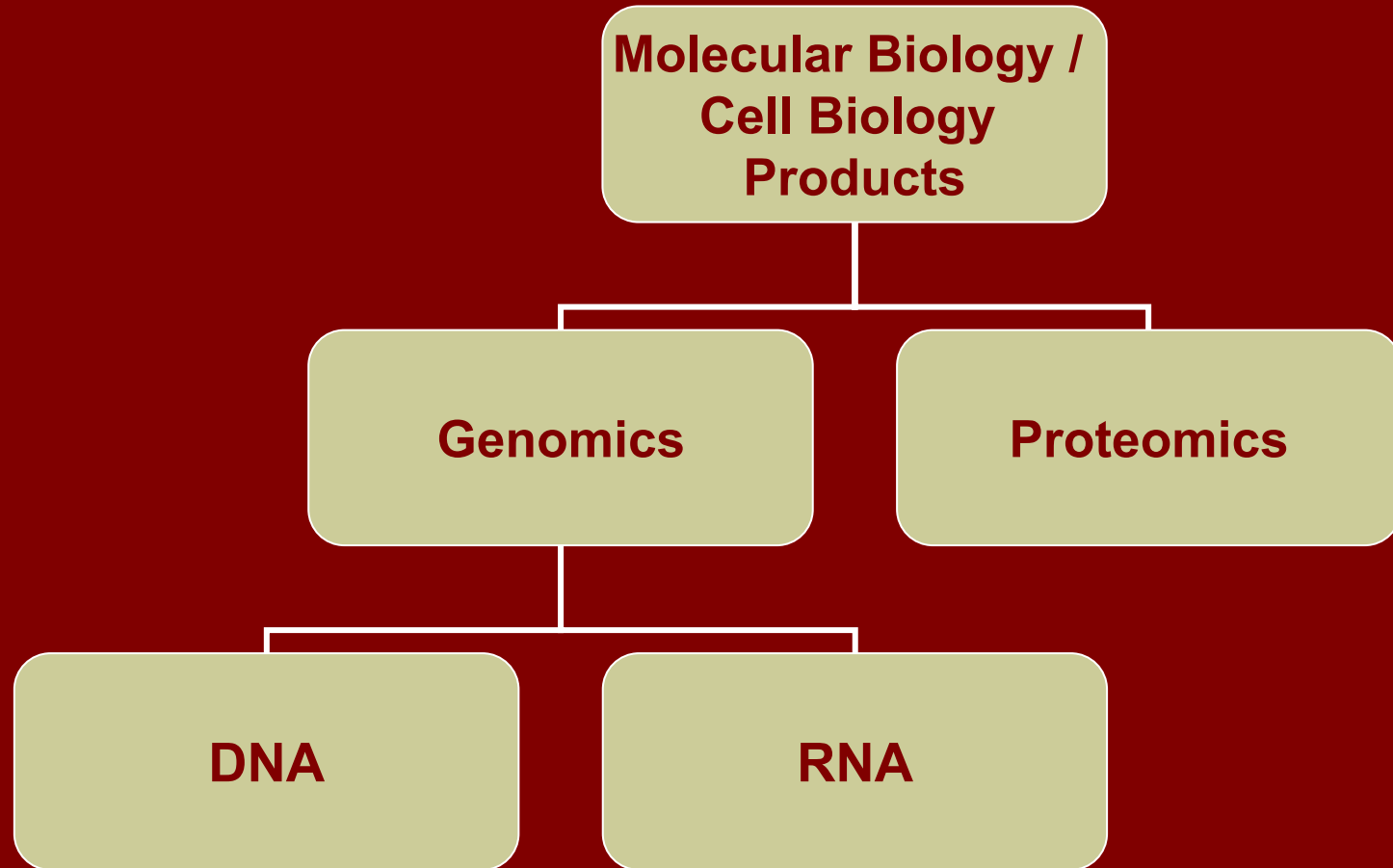



KRISHGEN BIOSYSTEMS

Understanding our Molecular / Cell Biology Products

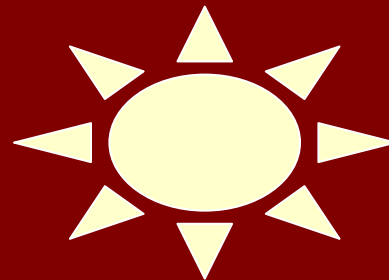


Product Categories Approach



Principal Companies Approach

**Biochain
Institute Inc.,
USA**

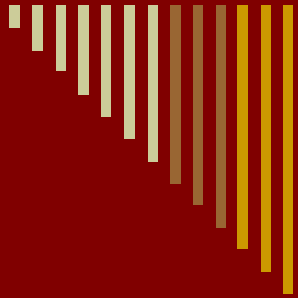


**Norgen Biotek,
Canada**

**MERCER –
KRISHGEN**

**MERCER Exp,
USA**

**MERCER – Elina
Biosciences**



Biochain Institute Inc., USA

Dr P Kit

(DNA/RNA/Protein Extraction from a single tissue source)

MicroRNA Markers

Genomic Tissues

- Frozen Tissues (sections / panels)
- Paraffin Embedded Tissues
- Frozen Tissue Arrays



Biochain Institute Inc., USA

Protein Extraction

- **Compartmental Protein Extraction Kits**
CNM / CNMCS Protein Extraction Kits
- **Total Protein Extraction Kits**

Protein Analysis

- Attoglow Western Blot Analysis Kits
- Western Blot Enhancing Kit

Proteins

Compartmental Proteins of different tissues / organs

Mega Western Protein Arrays

Proteins



Biochain Institute Inc., USA

RNA Extraction



RNAs

- Broad Range Total RNA Isolation Kit
- Easy-mRNA Kit for RNA isolation
- Total RNA Extraction Kit
- Cartilage RNA Isolation Kit
- MicroRNA Isolation Kit
- RNAmate (Polysaccharide & ProteoglySAN-Rh-Cy Decontamination Solution)
- EZ-RNA 96 Kit



Biochain Institute Inc., USA

RNA Analysis

- IsHyb In Situ Hybridization (ISH) Kit
- Reverse Transcription Checker Kit
- miR-24 One-Step qRT - PCR Detection Kit
- RNA Loading Buffer
- FastHyb Hybridization Solution



RNAs

mRNA of different tissues/organs

mRNA Arrays

mRNA Northern Blots

siRNA



Biochain Institute Inc., USA

DNA Extraction

- Genomic DNA Extraction Kit
- Goldmag Whole Blood Genomic DNA Extraction Kit
- EasyXpress Viral Nucleic Acid Release Kit
- EZ-DNA Extraction Kit

96 well Genomic DNA Plate

PCR Ready Genomic DNAs

DNA Methylation Detection Kit

Express Cloning Checker Kit



DNAs



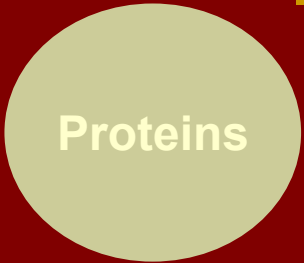
Biochain Institute Inc., USA

cDNAs

cDNA Panel

cDNA Libraries

DNAs



Norgen Biotek, Canada

ProteoSpin CBED Micro Kit

ProteoSpin Detergent Clean-Up Micro Kit

ProteoSpin Inclusion Body isolation Micro Kit

ProteoSpin Abundant Serum Protein Depletion Kit

ProteoSpin Urine Protein Concentration Kit

Proteo Ladder



Norgen Biotek, Canada

Total RNA Purification Kit

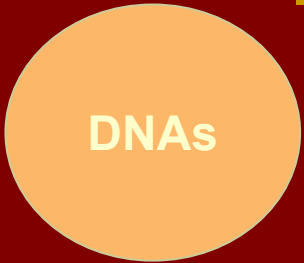
Cytoplasmic & Nuclear RNA Purification Kit

Leukocyte RNA Purification Kit

microRNA Purification Kit

RNA Ladder

RNAs



Norgen Biotek, Canada

Plasmid MiniPrep Kit

DNA Gel Extraction Kit

Bacterial Genomic DNA Isolation Kit

Yeast Genomic DNA Isolation Kit

Blood Genomic DNA Isolation Kit

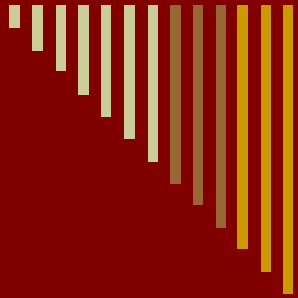
BAC DNA MiniPrep Kit

Urine DNA Isolation Kit

Saliva DNA Isolation Kit

Milk Bacterial DNA Isolation Kit

Urine Bacterial DNA Isolation Kit



Genomic DNA/RNA

MERCER Exp, USA

Taq DNA Polymerase

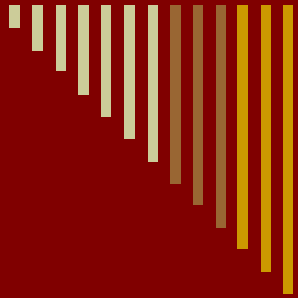
M-MLV Reverse Transcriptase

PCR Master Mix

qPCR Master Mix

One Step RT PCR Kit

RNA Mix Prep Kit



MERCER Exp, USA - Star™

DNA / RNA Extraction Controls

DNA-PCR and RNA-RT-PCR assays need to control for the following :

Extraction of DNA or RNA, Amplification, DNA-PCR and RNA RT inhibition, reagent quality including dNTPs, Buffers, Taq, reverse transcriptase, instrument function, including thermal cycling and fluorescent detection.

The Mercer answer to these control questions is to use bacteriophage-T4 for DNA and Q β for RNA. The Mercer reagents include:

T4 and Q β bacteriophage, PCR master mixes, Primers and probe reagents, plasmid DNA

Detection of the bacteriophage internal control DNA/RNA signifies a successful extraction and amplification.

Failure to detect the bacteriophage internal control DNA/RNA means the extraction or amplification procedure failed.

To use these reagents, T4 or Q β is added directly to the sample. The sample is then extracted for DNA or RNA.

The extracted nucleic acid, now containing T4 or Q β and the sample nucleic acids are used for PCR or RT-PCR.



Norgen Biotek, Canada

1. Plant/Fungi Total RNA Purification Kit :

- Purify complete RNA diversity, including microRNA, from plant and fungal species
- No phenol extractions
- No liquid nitrogen required for homogenization

2. Plant/Fungi DNA Isolation Kit :

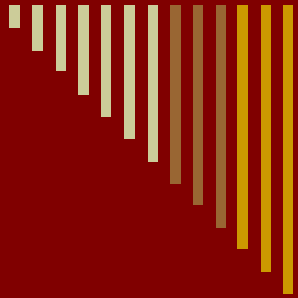
- Isolate total DNA including genomic, mitochondrial, chloroplast & viral DNA from plants & fungi
- No liquid nitrogen required for homogenization

3. Plant RNA/DNA Purification Kit :

- Isolate RNA (including microRNA) and DNA simultaneously from a single plant sample
- Reduce the number of extractions required for plant pathogen screening
- No phenol extractions

4. Direct Fungal DNA Isolation Kit :

- Rapidly isolate genomic DNA from fungi on the surfaces of symptomatic plant samples
- No need for tedious physical homogenization



Terminology

Proteomics

Proteomics is the large-scale study of proteins, particularly their structures & functions.

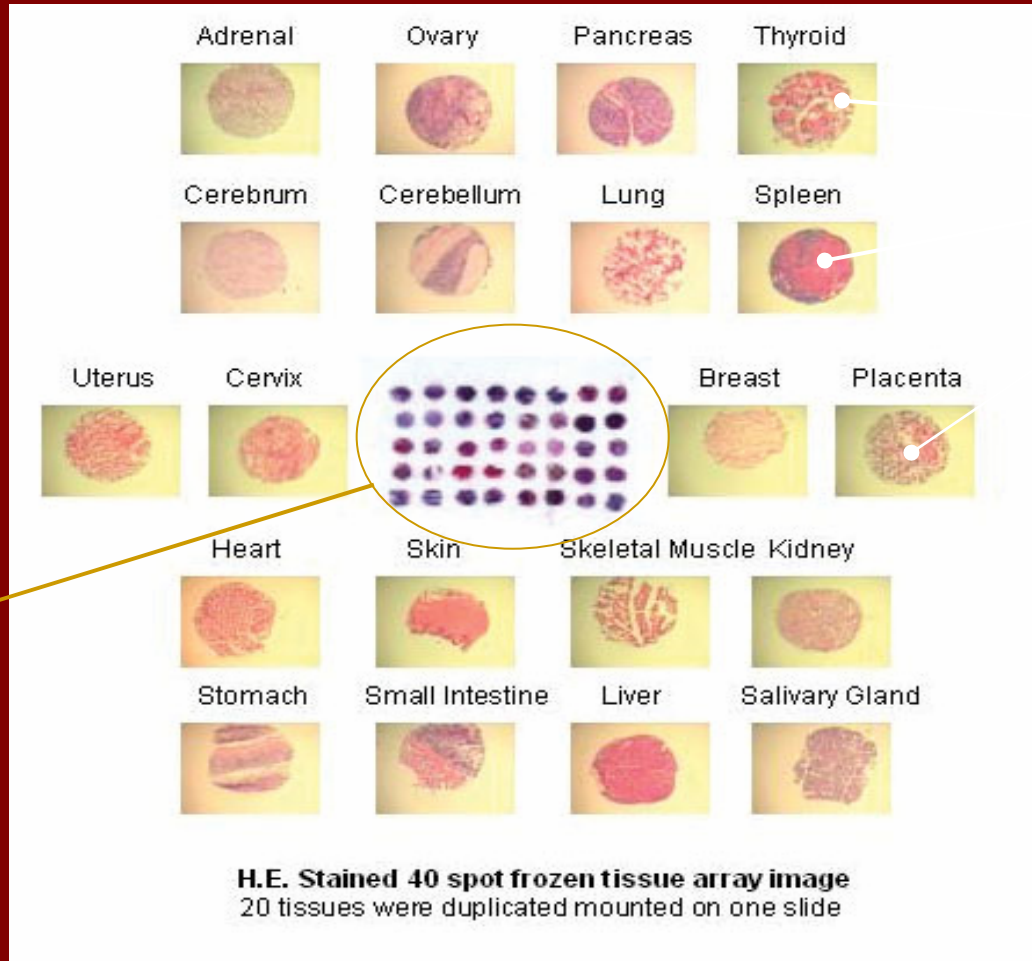
Genomics

Genomics is the study of an organism's entire genome. the **genome** of an organism is its whole hereditary information and is encoded in the DNA (or, for some viruses, RNA).

Frozen Tissues

Frozen Tissues are sections of organs which are cut and frozen to keep them intact usually at -20/-70Deg Celsius.

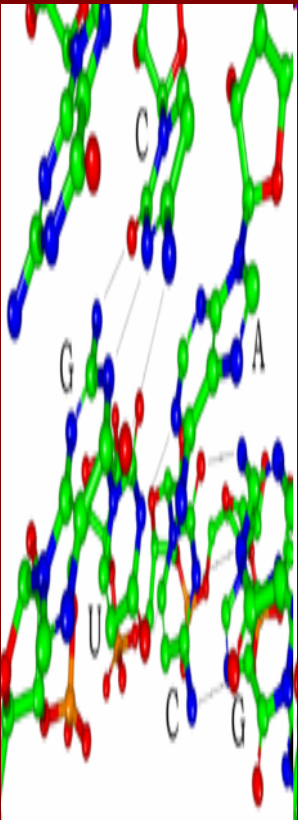
Terminology



Frozen
Tissue
Array

Frozen
Tissues

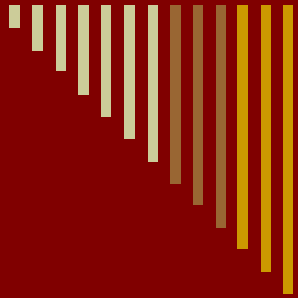
Terminology



Ribonucleic acid (RNA) is a nucleic acid and consists of a long chain of nucleotide units. RNA is central to the synthesis of proteins.

microRNAs (miRNA) are single-stranded RNA molecules which regulate gene expression.

Messenger RNA (mRNA) is the RNA that carries information from DNA to the ribosome, the sites of protein synthesis (translation) in the cell. The coding sequence of the mRNA determines the amino acid sequence in the protein that is produced. Many RNAs do not code for protein however.



Terminology

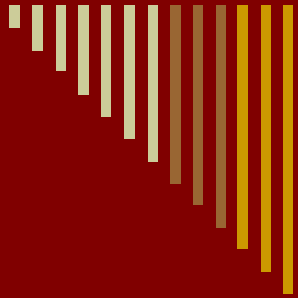
In Translation

Messenger RNA (mRNA) carries information about a protein sequence to the ribosomes, the protein synthesis factories in the cell. It is coded.

The mRNA is then bound to ribosomes and translated into its corresponding protein form with the help of tRNA.

Transfer RNA (tRNA) is a small RNA chain that transfers a specific amino acid to a growing polypeptide chain at the ribosomal site of protein synthesis during translation. After a certain amount of time the message degrades into its component nucleotides with the assistance of ribonucleases.

Ribosomal RNA (rRNA) is the catalytic component of the ribosomes. The ribosome binds mRNA and carries out protein synthesis.



Terminology

Regulatory RNAs

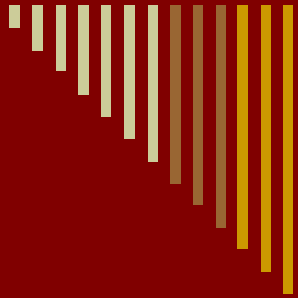
Several types of RNA can downregulate gene expression by being complementary to a part of an mRNA or a gene's DNA.

MicroRNAs (miRNA)

miRNA are found and act through RNA interference (RNAi), where an effector complex of miRNA and enzymes can break down mRNA which the miRNA is complementary to, block the mRNA from being translated, or accelerate its degradation.

Small interfering RNAs (siRNA)

They are often produced by breakdown of viral RNA or there are also endogenous sources of siRNAs in plants. siRNAs act through RNA interference in a fashion similar to miRNAs.



Terminology

Northern Blots

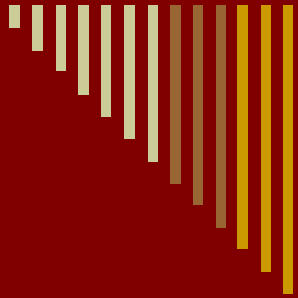
The northern blot is a technique used in molecular biology research to study gene expression. It is used to study RNA. The technique uses electrophoresis and detection with a hybridization probe.

Southern Blots

A Southern blot is a method routinely used in molecular biology to check for the presence of a DNA sequence in a DNA sample. Southern blotting combines agarose gel electrophoresis for size separation of DNA with methods to transfer the size-separated DNA to a filter membrane for probe hybridization.

Western Blots

The western blot (alternately, immunoblot) is a method of detecting specific proteins in a given sample of tissue homogenate or extract. It uses gel electrophoresis to separate native or denatured proteins.



Terminology

Compartmental Protein Extraction Kits

1. CNMCS Extraction Kit

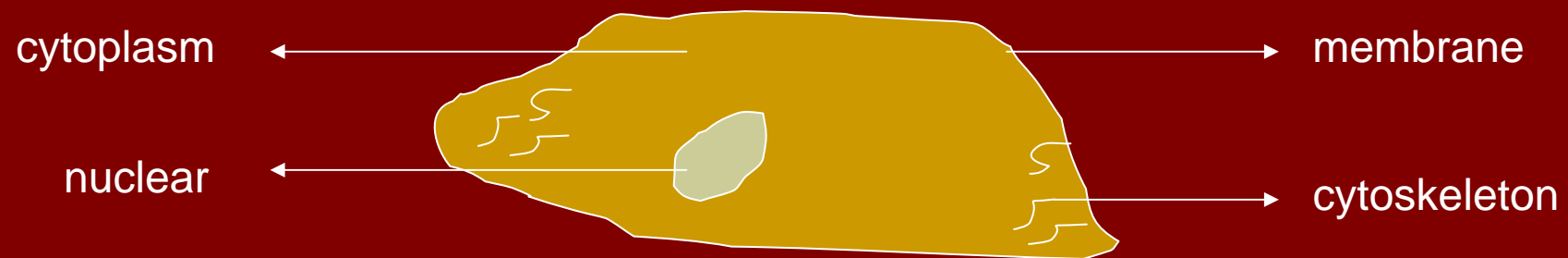
Extracting CNMCS

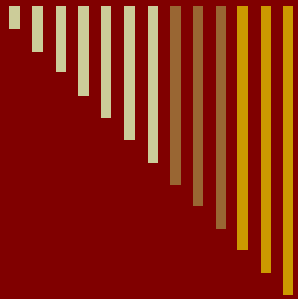
(Cytoplasmic, Nuclear, Membrane, and Cytoskeleton) proteins using one kit

2. CNM Extraction Kit

Extracting CNM

(Cytoplasmic, Nuclear and Membrane) proteins using one kit

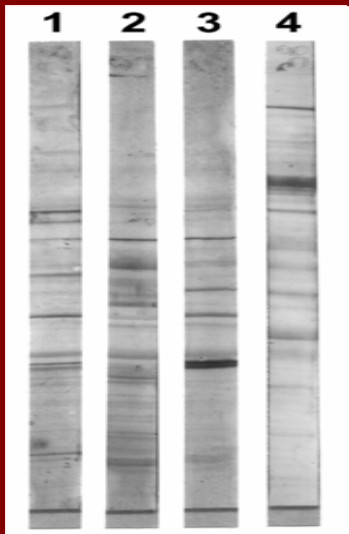




Terminology

Western Blots

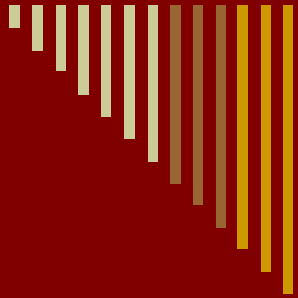
Immunoblot (Western blot) analysis of proteins separated by SDS-PAGE gradient gel electrophoresis. The proteins of the sample are separated using gel electrophoresis. The most common type of gel electrophoresis employs polyacrylamide gels and buffers loaded with Sodium Dodecyl Sulfate (SDS).



SDS-PAGE (SDS polyacrylamide gel electrophoresis)

Samples are loaded into *wells* in the gel. One lane is usually reserved for a *marker* or *ladder*, having defined molecular weights, typically stained so as to form visible, colored bands. When voltage is applied along the gel, proteins migrate into it at different speeds.

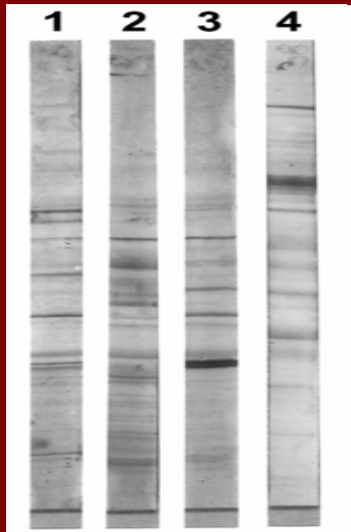
In order to make the proteins accessible to antibody detection, they are moved from within the gel onto a membrane made of nitrocellulose or polyvinylidene fluoride (PVDF). The membrane is placed on top of the gel, and a stack of tissue papers placed on top of that. The entire stack is placed in a buffer solution which moves up the paper by capillary action, bringing the proteins with it.



Terminology

Continued ...

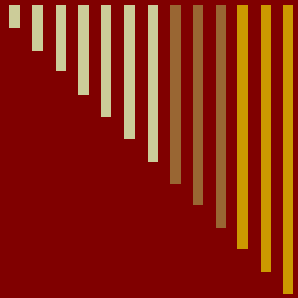
Since the membrane has been chosen for its ability to bind protein, and both antibodies and the target are proteins, steps must be taken to prevent interactions between the membrane and the antibody used for detection of the target protein.



Blocking of non-specific binding is achieved by placing the membrane in a dilute solution of protein - typically Bovine serum albumin (BSA) or non-fat dry milk with a minute percentage of detergent such as Tween 20.

The protein in the dilute solution attaches to the membrane in all places where the target proteins have not attached. This reduces "noise" in the final product of the Western blot, leading to clearer results, and eliminates false positives.

In the 2-step procedure, a primary antibody of interest and a secondary antibody conjugated to an enzyme is used. In the 1-step direct probe method a probe antibody conjugated to the enzyme is used.

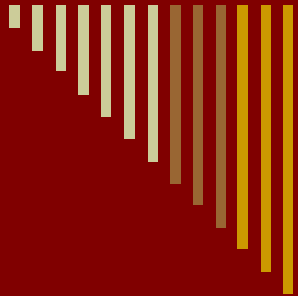


Terminology

DNA Methylation

DNA methylation is a type of chemical modification of DNA that can be inherited and subsequently removed without changing the original DNA sequence. DNA methylation involves the addition of a methyl group to DNA with the effect of reducing gene expression.

Since many tumor suppressor genes are silenced by DNA methylation during carcinogenesis, the kit – **DNA Methylation Detection Kit** has potential users who are working on tumors.



Terminology

Express Cloning Checker

Cloning is the process of making an identical copy of something. It collectively refers to processes used to create copies of DNA fragments (molecular cloning), cells (cell cloning), or organisms.

The Express Cloning Checker Kit is to check that the cloning has occurred efficiently by a fast and rapid method without using Miniprep Plasmids etc.

cDNAs

Complementary DNA (cDNA) is DNA synthesized from a RNA in a reaction catalyzed by the enzyme reverse transcriptase.

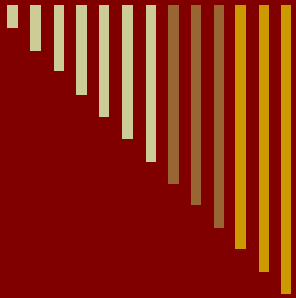
Reverse Transcriptase

Normal Rranscription involves the synthesis of RNA from DNA; hence, Reverse transcription is the *reverse* of this i.e. the synthesis of complementary DNA from RNA.



Norgen Biotek Product Overview

Kit Name	Application	Typical Yield/Column	Kit Sizes
<i>DNA CLEAN-UP KITS</i> DNA Gel Extraction Kit	Rapid purification of DNA fragments from agarose gels	Up to 90% for inputs > 1 µg	50 smpls 100 smpls
PCR Purification Kit	Rapid purification of amplified DNA products from PCR mixes	> 90% of input amount	50 smpls 100 smpls
Enzymatic Reaction Clean-Up Kit	Rapid purification of DNA from various enzymatic reaction mixes	> 90% of input amount	50 smpls
Endotoxin Removal Kit (Mini)	Rapid removal of endotoxins from up to 40 µg of previously purified DNA	> 90% of input amount	50 smpls
Endotoxin Removal Kit (Maxi)	Rapid removal of endotoxins from up to 1 mg of previously purified DNA	> 90% of input amount	4 smpls



Norgen Biotek Product Overview

Kit Name	Application	Typical Yield/Column	Kit Sizes
<i>PLASMID DNA PREPARATION KITS</i>			
Plasmid MiniPrep Kit	Rapid analytical scale preparation of plasmid DNA	Up to 20 µg of plasmid from 1.5 mL of culture	50 smpls 100 smpls
Plasmid DNA MaxiPrep Kit (Endotoxin Free)	Rapid preparation of large quantities of endotoxin-free plasmid DNA	Up to 1 mg from 100 mL of culture	4 smpls
Low Copy Plasmid MiniPrep Kit	Rapid preparation of low copy number plasmid DNA from small batches of E. coli	0.5 - 1 µg from 3 mL of culture	25 smpls
BAC DNA MiniPrep Kit	Rapid preparation of BACs and other large DNA constructs from small batches of E. coli	0.6 - 1 µg from 3 mL of bacterial culture	25 smpls

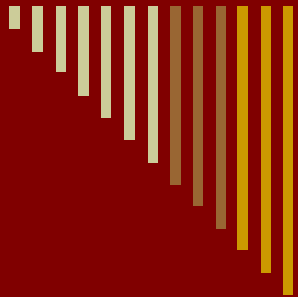


Norgen Biotek Product Overview

Kit Name	Application	Typical Yield/Column	Kit Sizes
Bacterial Genomic DNA Isolation	Rapid preparation of genomic DNA from 2×10^9 viable cells	Up to 20 μg	50 smpls
Milk Bacterial DNA Isolation	Rapid purification of genomic DNA from bacteria in milk	Varies, depends on amount of bacteria and species present in milk	25 smpls
Urine Bacteria DNA Isolation	Rapid purification of bacterial genomic DNA from small urine samples	Varies, depends on amount of bacteria and species present in urine	50 smpls
Yeast Genomic DNA Isolation	Rapid preparation of genomic DNA from 1×10^8 viable yeast cells	Varies; depends on cell density Of culture and species	50 smpls

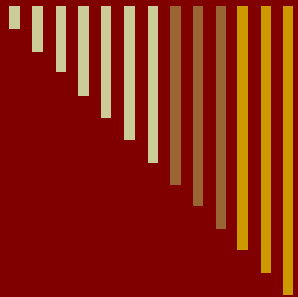
A KRISHGEN Presentation © 2008

Blood Genomic DNA Isolation Kit **Rapid preparation of genomic DNA from up to** **Varies;**
depends on cell density **50 samples**



Norgen Biotek Product Overview

Kit Name	Application	Typical Yield/Column	Kit Sizes
Blood Genomic DNA Isolation Kit	Rapid preparation of genomic DNA from up to 100 μL of blood sample	Varies; depends on cell density of blood sample	50 smpls
Urine DNA Isolation Kit	Rapid procedure for isolating DNA from 2 mL of urine	Up to 50 ng	50 smpls
Saliva DNA Isolation Kit	Rapid procedure for isolating genomic DNA from small saliva samples	Up to 10 μg from 1 mL of saliva	25 smpls



Norgen Biotek Product Overview

Kit Name	Application	Kit Sizes
<i>RNA SAMPLE PREPARATION KITS</i>		
Total RNA Purification Kit	Rapid isolation and purification of RNA 50 samples from cultured animal cells, small tissue samples, blood, bacteria, yeast and fungi.	50 smpls
Cytoplasmic & Nuclear RNA Purification Kit	Rapid isolation and purification of Cytoplasmic and nuclear RNA fractions from cultured animal cells and small tissue samples.	50 smpls
Leukocyte RNA Purification Kit	Rapid isolation and purification of total leukocyte RNA from mammalian blood samples.	50 smpls
microRNA Purification Kit	Rapid isolation and purification of small RNA molecules from cultured cells, small tissue samples and bacterial cells.	25 smpls



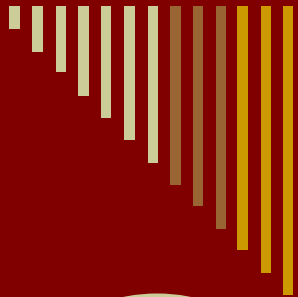
Norgen Biotek Product Overview

Kit Name	Application	Typical Yield/Column	Kit Sizes
<i>PROTEIN SAMPLE PREPARATION KITS</i>			
ProteoSpin™ CBED Micro Kit	Concentration, buffer exchange and desalting of protein samples	2 - 50 µg	25 smpls 50 smpls
ProteoSpin™ CBED Maxi Kit	Concentration, buffer exchange and desalting of protein samples	0.25 - 8 mg	4 smpls
ProteoSpin™ Detergent Clean-up Micro Kit	Effective removal of SDS, Triton® X-100 and other detergents from small protein samples	2 - 50 µg	25 smpls 50 smpls
ProteoSpin™ Detergent Clean-up Maxi Kit	Effective removal of SDS, Triton® X-100 and other detergents from protein samples	0.25 - 8 mg	4 smpls
ProteoSpin™ Inclusion Body Isolation Micro Kit	Facilitates the screening of E. coli clones that express recombinant proteins in inclusion bodies	2 - 50 µg	20 smpls 50 smpls



Norgen Biotek Product Overview

Kit Name	Application	Typical Yield/Column	Kit Sizes
<i>PROTEIN SAMPLE PREPARATION KITS</i>			
ProteoSpin™ Inclusion Body Isolation Maxi Kit	Facilitates the isolation of recombinant proteins expressed in the form of inclusion bodies from E. coli	Up to 12 mg	4 smpls
ProteoSpin™ Urine Protein Concentration Micro Kit	Concentration of dilute solutions of urine proteins from small volumes of urine.	1 mL of urine	25 smpls
ProteoSpin™ Urine Protein Concentration Maxi Kit	Concentration of dilute solutions of urine proteins from large volumes of Urine	20 mL of urine	4 smpls
ProteoSpin™ Serum Depletion Kit	Effective depletion of major serum proteins from serum and Plasma samples	Deplete up to 500 µg of serum proteins	25 smpls
ProteoSpin™ On-Column Proteolytic Digestion Kit	Fast and simple procedure for the generation of purified peptides	Digest up to 15 µg of protein	25 smpls



Summary

Biochain Institute Inc

Norgen Biotek

Proteins

Extraction Kits (from Tissues)

Extraction Kits (from a variety of samples like blood plasma, semen, urine etc)

Analysis Kits

No Analysis Kits

RNAs

Extraction Kits (from Tissues)

Extraction Kits (from a variety of samples like cultured animal cells, blood plasma, semen, urine, yeast, fungi etc)

Analysis Kits

No Analysis Kits

DNAs

Extraction Kits (from Tissues)

Extraction Kits (from a variety of samples like blood plasma, culture cells, urine, yeast, fungi, milk etc)

Analysis Kits

No Analysis Kits



3 Unique Products to Promote for Norgen Biotek, Canada

Proteins

ProteoSpin™ Inclusion Body Isolation Kit

RNAs

microRNA Purification Kit

DNAs

Low Copy Plasmid Mini Prep Kit



3 Unique Products to Promote for Norgen Biotek, Canada



Proteins

ProteoSpin™ Inclusion Body Isolation Kit

Inclusion Body

The kit is for separating out / isolating the Inclusion bodies from samples. Inclusion bodies are nuclear or cytoplasmic aggregates of stainable substances, usually proteins.

When genes from one organism are expressed in another, the resulting protein sometimes forms inclusion bodies.



3 Unique Products to Promote for Norgen Biotek, Canada

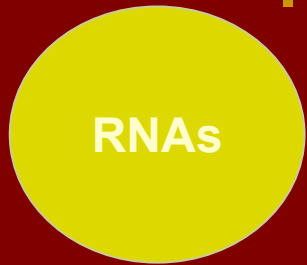


Proteins

ProteoSpin™ Inclusion Body Isolation Kit

- 3 kits in one: lysis, solubilization, purification of recombinant protein
- Versatile – acidic and basic proteins
- Fast - from “cell to gel” in 1 hour
- Reduces Endotoxin levels
- Helps optimize purification before scale up

Endotoxins are
potentially toxic,
natural compounds
found inside pathogens

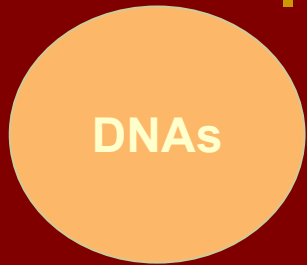
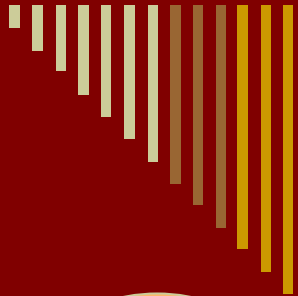


3 Unique Products to Promote for Norgen Biotek, Canada

microRNA Purification Kit

provides a rapid method for the isolation and purification of small RNA molecules (< 200 nt) from cultured animal cells, small tissue samples, and bacterial cells. These small RNAs include regulatory RNA molecules such as microRNA (miRNA) and short interfering RNA (siRNA), as well as tRNA and 5S rRNA.

- **Fast and easy processing**
(Rapid spin-column format allows processing of 10 samples in 45 minutes)
- **No phenol : chloroform extractions**
- **Isolate all small RNA molecules**
- **Minimal contamination from large RNA molecules & genomic DNA**
- **Recovered RNA is suitable for downstream applications relating to gene regulation and functional analysis, including northern blotting & microarray analysis.**



3 Unique Products to Promote for Norgen Biotek, Canada

Low Copy Plasmid Mini Prep Kit

The Kit is designed for the rapid preparation of low copy number plasmid DNA from small batches of E. coli.

- **High Recovery** : 0.5 to 1 µg of low copy DNA can be purified from 3.0 mL of bacterial culture.
- **Alcohol-free protocol** : No alcohols are used during the purification process, thus the DNA is compatible with alcohol sensitive downstream applications.
- **Fast and Easy Processing** : Rapid spin-column format allows for the processing of multiple samples in 30 minutes.
- **Recovered DNA is suitable for downstream applications** : Purified plasmid DNA is fully compatible with restriction enzyme digestions & sequencing.



3 Unique Products to Promote for Biochain Institute Inc., USA

Proteins

Attoglow Western Blot System - with Millennium Enhancer

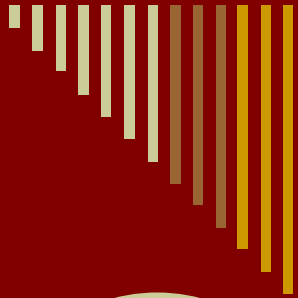
RNAs

mRNAs

DNAs

DNA Methylation Detection Kit

DNA Express Checker Cloning Kit



3 Unique Products to Promote for Biochain Institute Inc., USA

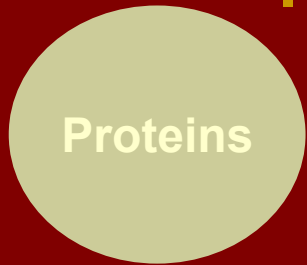
Proteins

Attoglow Western Blot System - with Millennium Enhancer

It is an ultra-sensitive chemiluminescent Western blot analysis kit developed by Biochain. It detects protein at attogram (10⁻¹⁸ g) or yoctomole (10⁻²⁴ M) levels.

**This kit consists of three parts:
Millennium Enhancer, protein interaction system and detection system.**

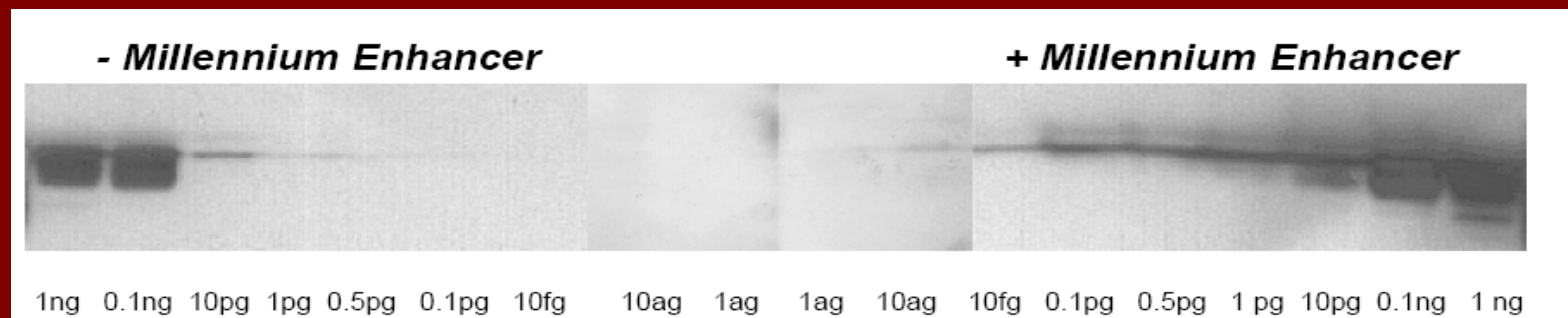
**Available for secondary antibodies like –
Anti - Mouse
Anti - Rabbit
Anti - Chicken
Anti - Goat**

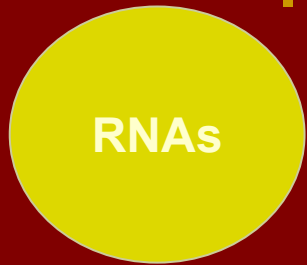


3 Unique Products to Promote for Biochain Institute Inc., USA

Attoglow Western Blot System - with Millennium Enhancer

Unlike conjugated complex- or chemiluminescent substrate-enhancers, Millennium Enhancer works through a novel mechanism by increasing antigen and antibody affinity and accessibility. Due to its unique mechanism, Millennium Enhancer can work with different antigens and antibodies, such as structural proteins (Actin), enzymes (GAPDH) or membrane proteins (EGFR). It could significantly boost Western blot signals, and work together with the two other kinds of enhancing mechanisms to achieve multiplied enhancing effects.



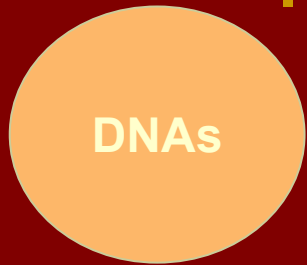


3 Unique Products to Promote for Biochain Institute Inc., USA

mRNA

mRNA is isolated from total RNA obtained from human adult and fetal normal tissues, human tumor and diseased tissues, as well as from mouse, rat, monkey, and plant tissues. BioChain's proprietary technology to minimize the presence of ribosomal RNA.

- mRNA isolated from a wide variety of tissues and cells
- DNase I treatment to ensure absence of genomic DNA
- RNA lengths can reach over 12 kb, indicating the intactness
- High efficiency reverse transcription
- Representative of total RNA
- Documentation of tissues' clinical histories is available

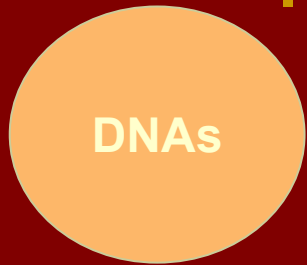


3 Unique Products to Promote for Biochain Institute Inc., USA

DNA Methylation Detector Kit

Methylation-specific PCR (MSP) technology contains two steps: sodium bisulfite modification and polymerase chain reaction. It is a very sensitive Methylated Genomic DNA Detection method because it is PCR based.

- Very sensitive – PCR based detection method.**
- Cost effective**
- Simple - Very user-friendly, hands on time is less than 30 minutes**



3 Unique Products to Promote for Biochain Institute Inc., USA

DNA Express Checker Cloning Kit

Express Cloning Checker Kits provide two highly efficient methods of identifying recombinant colonies after transformation without time-consuming plasmid preparation. By using the large-scale screen method, all the user needs to do is to transfer partial colonies of E. coli bacteria directly from the transformation plates into the solutions provided by the kits and immediately run an agarose gel electrophoresis. Within one to two hours, the results will show exactly which are recombinant colonies, instead of spending two days using time and labor-intensive analysis methods such as plasmid DNA miniprep or colony hybridization.