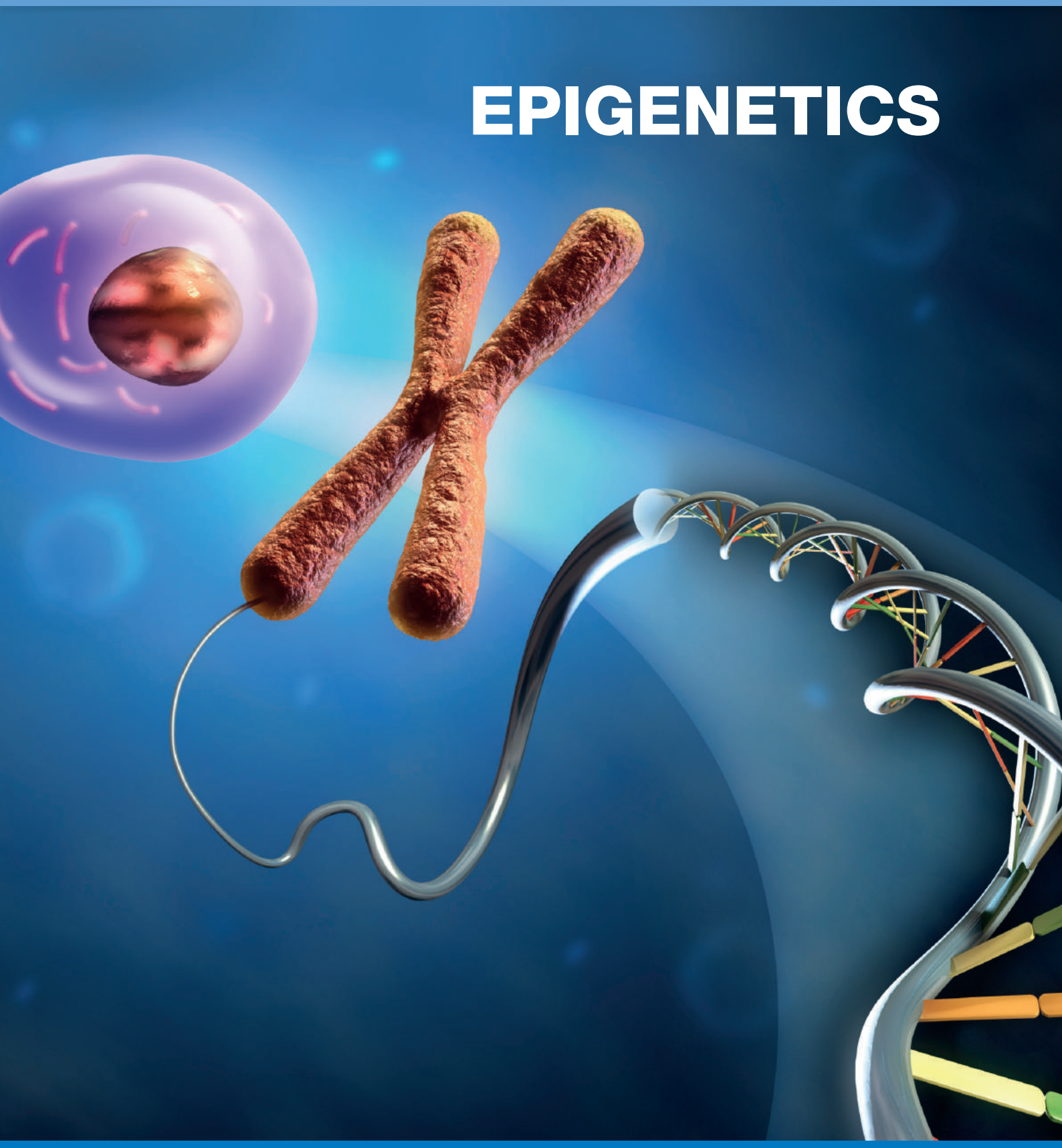
BioNordika
YOUR SCIENTIFIC SUPPLIER

Science where you are

Volume 4 Issue 1

EPIGENETICS



BIONORDIKA (SWEDEN) AB | NORRBACKAGATAN 47 | TEL 08 306 010 | WWW.BIONORDIKA.SE | INFO@BIONORDIKA.SE

EPIGENETICS

Epigenetics is the study of heritable changes in gene expression that are not encoded in the DNA of the genome. Encouraging evidence has linked epigenetic effects to oncogenesis, progression and treatment of cancer, the regulation of development and function of the nervous system, gene regulation, cellular stress events, nutrigenomics, aging and DNA repair. Considerable ongoing efforts are directed towards identifying the dynamic functions of various modifications to DNA and its associated proteins and elucidating their mechanisms.

New England Biolabs

DNA Methylation

Methods to analyze DNA methylation/demethylation and their functional effects are critical to epigenetics researchers. Methylation profiles of epigenome are used for disease identification and for research and therapeutic development. Analysis can be gene-specific or global depending on downstream applications.

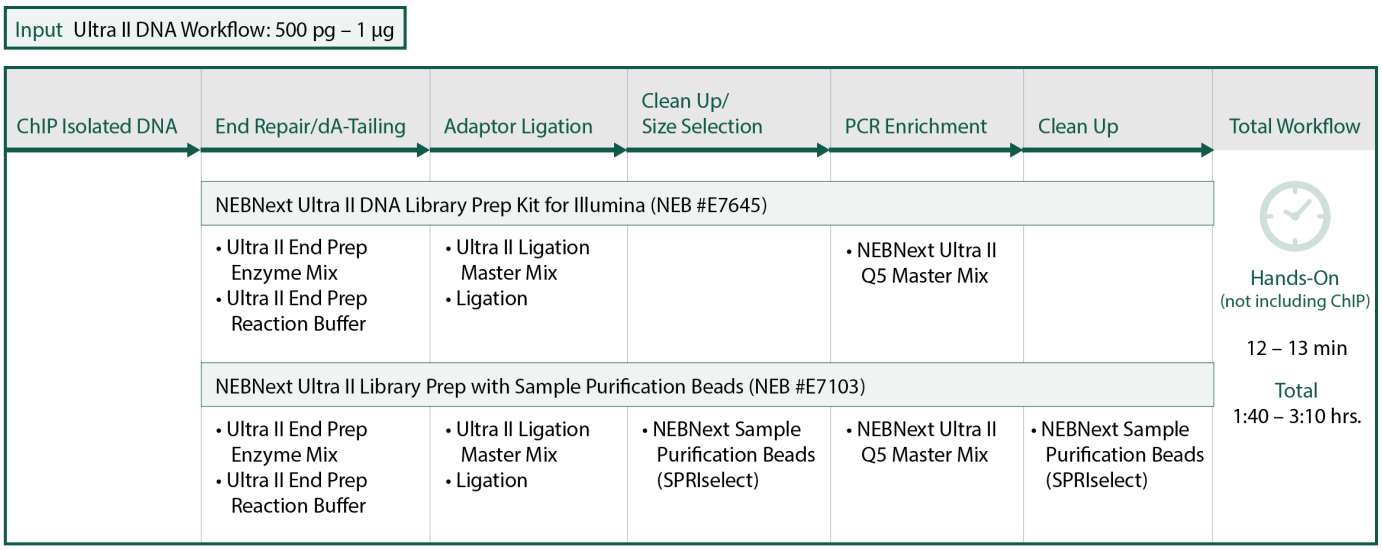
EpiMark® 5-hmC and 5-mC Analysis Kit

In mammalian genomes, 5-mC can be enzymatically oxidized to 5-hmC (5-hydroxymethylcytosine). This modification is suggested to be an intermediate between methylation and demethylation of the genome. Occupancy of 5-hmC correlates with inactive or non-productive promoters. 5-hmC pattern is different from 5-methylcytosine (5-mC) in many instances.

Sodium bisulfite conversion of genomic DNA to differentiate and detect unmethylated versus methylated cytosines is the gold standard for DNA methylation analysis. The major drawback to bisulfite conversion is that it does not distinguish between 5-mC and 5-hmC DNA. The EpiMark® 5-hmC and 5-mC Analysis Kit can be used to analyze and quantitate 5-methylcytosine and 5-hydroxymethylcytosine within a specific locus. The kit distinguishes 5-mC from 5-hmC by the addition of glucose to the hydroxyl group of 5-hmC via an enzymatic reaction utilizing T4 β-glucosyltransferase (T4-BGT). When 5-hmC occurs in the context of CCGG, this modification converts a cleavable MspI site to a noncleavable one. The relative quantitation of 5-mC and 5-hmC can thus be shown.

Product	Cat#	Size
EpiMark® 5-hmC and 5-mC Analysis Kit	#E3317S	20 rxns
EpiMark® Bisulfite Conversion Kit	#E3318S	48 rxns
EpiMark® Methylated DNA Enrichment Kit	#E2600S	25 rxns
EpiMark® Hot Start Taq DNA Polymerase	#M0490S/L	100/500 rxns

ChIP-seq with NEBNext® Ultra™ II DNA Library Prep Kit for Illumina®



Introduction to ChIP-Seq

Chromatin immunoprecipitation (ChIP) followed by sequencing, ChIP sequencing (ChIP-Seq) is a powerful method to identify genome-wide DNA binding sites for transcription factors and other proteins.

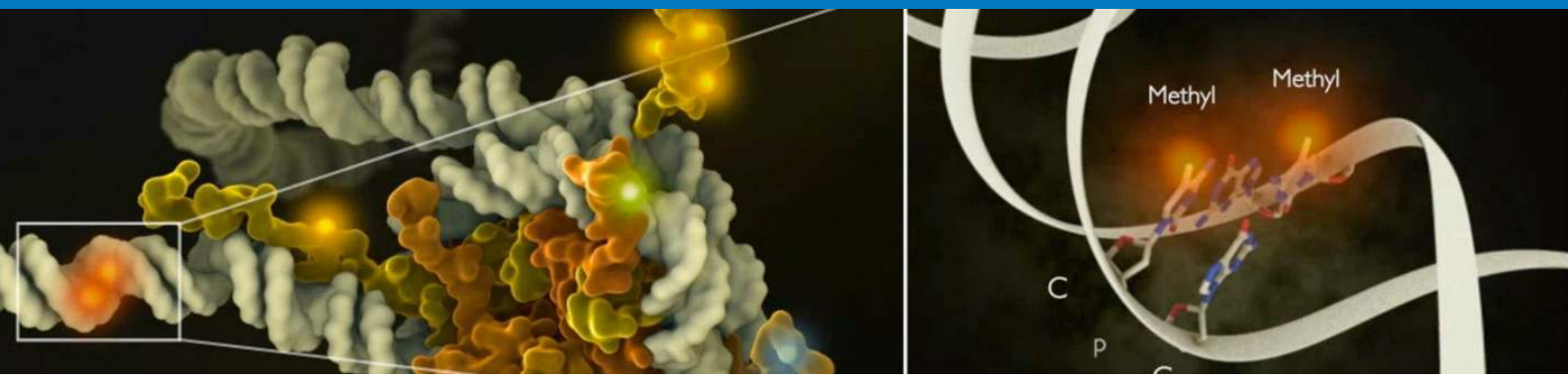
Advantages of ChIP-Seq

- Captures DNA motifs for co-regulatory factors, transcription factors or histone modifications across the whole genome of any organism
- Defines transcription factor binding sequences
- Identifies gene regulatory networks

Get more from your ChIP-seq with NEBNext Ultra IIDNA Library Prep Kit for Illumina

- Generate more of what you need, with the highest library yields
- Use to generate high quality libraries from a broad range of input amounts, from 500 pg to 1 µg
- Prepare libraries from ALL your samples, including GC-rich DNA and FFPE DNA samples
- Improve yields and quality for target enrichment applications
- Save time with streamlined workflows, reduced hands-on time and automation compatibility, and enjoy the flexibility of kit or module formats

Cat#	Product	Size
#E7645S/L	NEBNext® Ultra™ II DNA Library Prep Kit for Illumina®	24/96 rxns
#E7560S	NEBNext® Multiplex Small RNA Library Prep Kit for Illumina® (Index Primers 1-48)	96 rxns
#E7300S/L	NEBNext® Multiplex Small RNA Library Prep Set for Illumina® (Set 1, Index Primers 1-12)	24/96 rxns
#E7580S/L	NEBNext® Multiplex Small RNA Library Prep Set for Illumina® (Set 2, Index Primer 13-24)	24/96 rxns
#E7535S/L	NEBNext® Multiplex Oligos for Illumina® (Methylated Adaptor, Index Primers Set 1)	24/96 rxns



NEBNext® Multiplex Oligos for Illumina® (Methylated Adaptor)

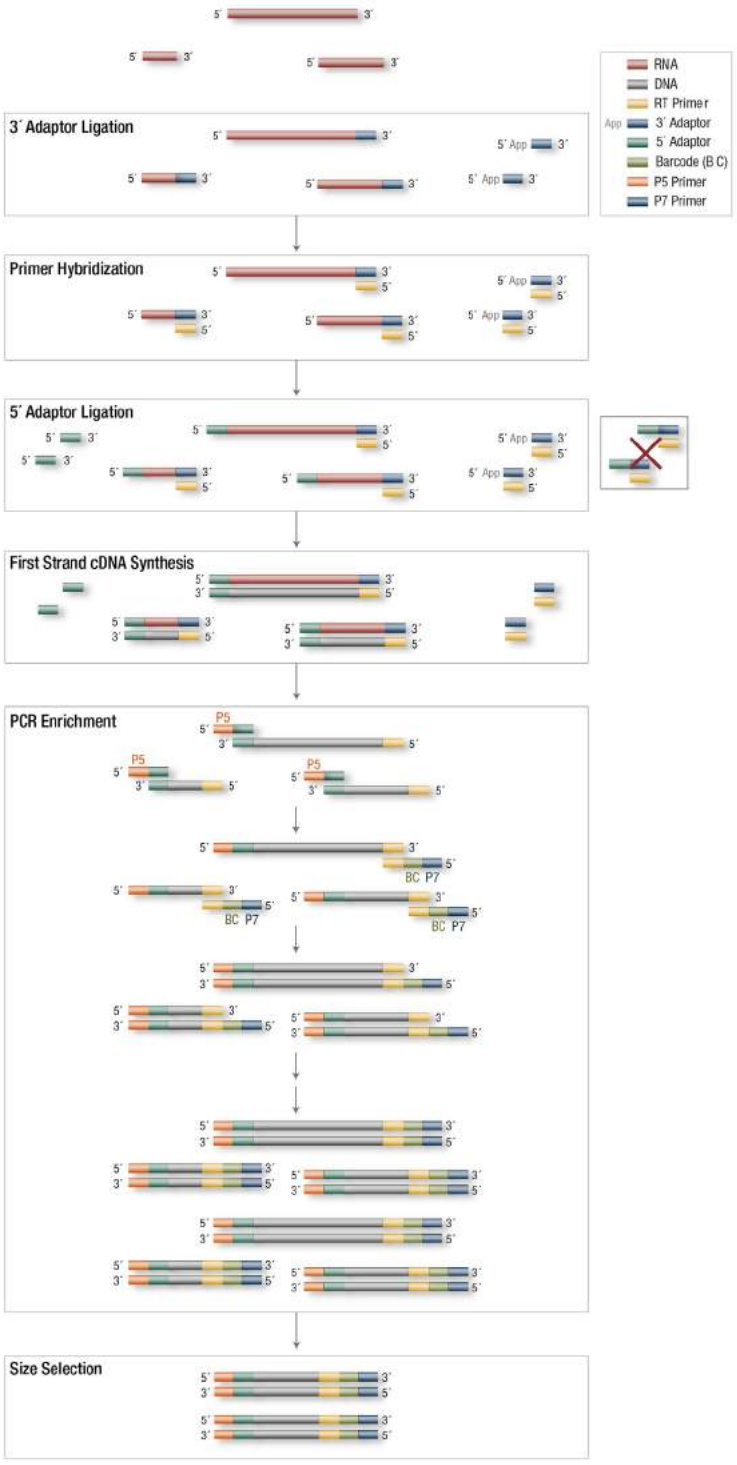
NEBNext® Multiplex Oligos includes a methylated version of the NEBNext adaptor, which is compatible with library preparation for bisulfite sequencing protocols.

- High efficiency adaptor ligation
- Minimized adaptor-dimer formation
- Includes index primers for library multiplexing
- Compatible with bisulfite sequencing protocols
- Compatible with NEBNext® Ultra™ II DNA Library Prep Kit for Illumina®

NEBNext® Multiplex Small RNA Library Prep Set for Illumina®

The unique workflow of the NEBNext® Small RNA library prep kits addresses the challenge of minimization of adaptor-dimers while achieving production of high-yield, diverse multiplex libraries in a simple protocol.

- Minimized adaptor-dimer contamination
- High yields
- Input RNA can be Total RNA
- Suitable for methylated small RNAs (e.g., piRNAs) as well as unmethylated small RNAs



Workflow for NEBNext Small RNA Library SET for Illumina

Diagenode
helps you master Chromatin immunoprecipitation

Chromatin immunoprecipitation (ChIP) is a method used to determine the location of DNA binding sites on the genome for a specific protein of interest, giving invaluable insights into the regulation of gene expression. ChIP is frequently used in studies that focus on cellular differentiation, tumor suppressor gene silencing, the effect of histone modifications on gene expression, and other studies involving transcriptional activation and repression. Diagenode offers complete, validated solutions for studying protein-DNA interactions at known genomic binding sites and on a genome-wide level.

Diagenode ChIP kit Selection Guide

Diagenode offers a wide range of kits for ChIP for characterization of histone or transcription factor (TF) DNA binding sites. You have also the flexibility to choose individual kit components from antibodies, buffers, beads, chromatin shearing and purification reagents.

		KIT				
		iDeal ChIP-qPCR	**iDeal ChIP-seq for Histones**	**iDeal ChIP-seq for TF**	**True MicroChIP**	**Universal Plant ChIP-seq**
FEATURES	Starting material: cells/IP	H: 100 K - 1 M TF: 4 M	100 K - 1 M	4 M	10 K - 100 K	180 K - 1.5 M
	Starting material: tissues/IP	H: 1.5 - 5 mg TF: 30 mg	1.5 - 5 mg	30 mg		0.1 - 2 g fresh weight
	Target: histones	✓	✓		✓	✓
	Target: Transcription Factors	✓		✓		✓
	ChIP-qPCR suitable	✓	✓	✓	✓	✓
	ChIP-seq suitable		✓	✓	✓	✓
	1.5 hour handling time with 2 day turnaround	✓	✓	✓	✓	✓
	Automated version available	✓	✓	✓	✓	✓
	Control antibodies		IgG and H3K4me3	IgG and CTCF	IgG and H3K4me3	IgG and H3K4me3
	Control PCR primers		GAPDH TSS and Myoglobin exon 2	H19 and Myoglobin exon 2	GAPDH TSS and Myoglobin exon 2	Arabidopsis FLC - ATG and - Intron1
	Included buffers and reagents	• Cell lysis • Chromatin shearing • IP • DNA isolation	• Cell lysis • Chromatin shearing • IP • DNA purification	• Cell lysis • Chromatin shearing • IP • DNA purification	• Cell lysis • Chromatin shearing • IP • Elution	• Cell lysis • Chromatin shearing • IP • DNA purification

All kits are automatable and include necessary buffer and reagents.

Exceptional shearing and sonication of biological samples for any field of study

Diagenode offers state-of-the-art shearing devices for:

• DNA and RNA shearing • Chromatin shearing
• FFPE nucleic acid extraction • Tissue and cell disruption
• Protein, DNA, RNA extraction

Diagenode's instruments are therefore ideal for a number of applications in various fields of studies including environmental research, toxicology, genomics and epigenomics, cancer research, stem cells and development, neuroscience, clinical applications, agriculture and many more.

Megaruptor®

The Megaruptor is a hydrodynamic shearing instrument for DNA shearing between 3kb–75kb and represents the best shearing device for the tightest distribution of long DNA fragments. Shearing performance is independent of the source, concentration, temperature, or salt content of a DNA sample.

- *User-friendly software*
- *Tight fragment size distribution*
- *Hydropores eliminate clogging*
- *High quality ultra-long DNA librairies*
- *Two samples can be processed sequentially*

Bioruptor® Pico

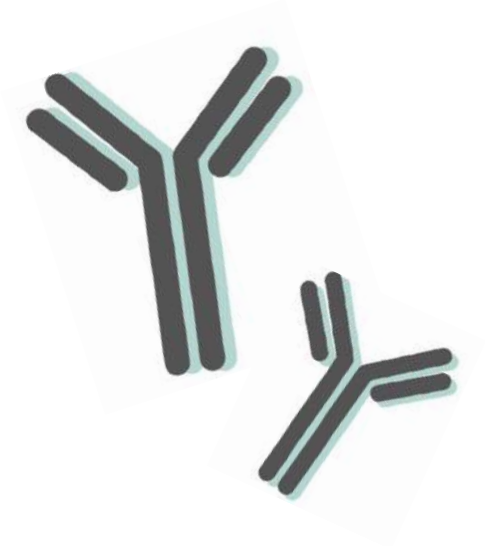
The Bioruptor Pico is the latest innovation in shearing and represents a new breakthrough as an all-in-one shearing system.

- *Simultaneous sonication of 6–16 samples*
- *Ultra-low volumes of 5 µl to larger samples of up to 2 ml*
- *Advanced timing control*
- *Temperature-controlled*

Bioruptor® Plus

The Bioruptor Plus is an excellent device for shearing chromatin, cell and tissue disruption prior to mass spectrometry analysis and many other applications.

- *Easy to use*
- *Processing of 3–12 samples*
- *Sample size 100 µl–20 ml*
- *Advanced timing control*
- *Temperature-controlled*



Rigorously validated Epigenetics antibodies

High quality antibodies are crucial for the success of ChIP and ChIP-seq experiments, Diagenode therefore uses rigorous quality control processes with stringent criteria for antibody validation. Every new lot is tested using the same stringent criteria and compared to the previous lot before release with the batch-specific validation data for provided on every data sheet.

The wide collection of antibodies is categorized by the applications in which they were validated, giving you the flexibility to choose the right antibody for your experiment.

Complete solutions for DNA methylation studies

Whether you are experienced or new to the field of DNA methylation, Diagenode offers complete solutions to make your assay as easy and convenient as possible while ensuring consistent data between samples and experiments.

The main approaches for studying DNA methylation utilized in Diagenode products are:

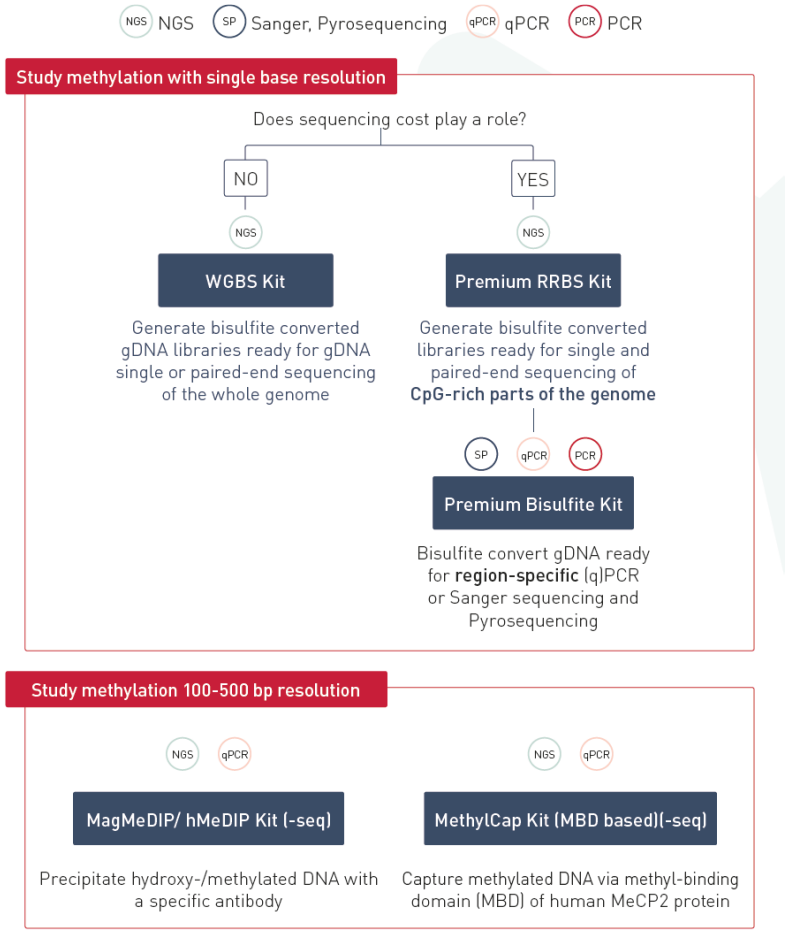
Bisulfite conversion

- Single nucleotide resolution
- Quantitative analysis-methylation rate (%)
- Gold standard and well studied
- Compatible with automation

Methylated DNA enrichment

- 100 – 500 bp resolution
- Qualitative analysis
- Compatible with automation

Diagenode DNA methylation kit Selection Guide



Cell Signaling Technology

Chromatin Immunoprecipitation with SimpleChIP® Kits: Sonication & Enzymatic Digestion

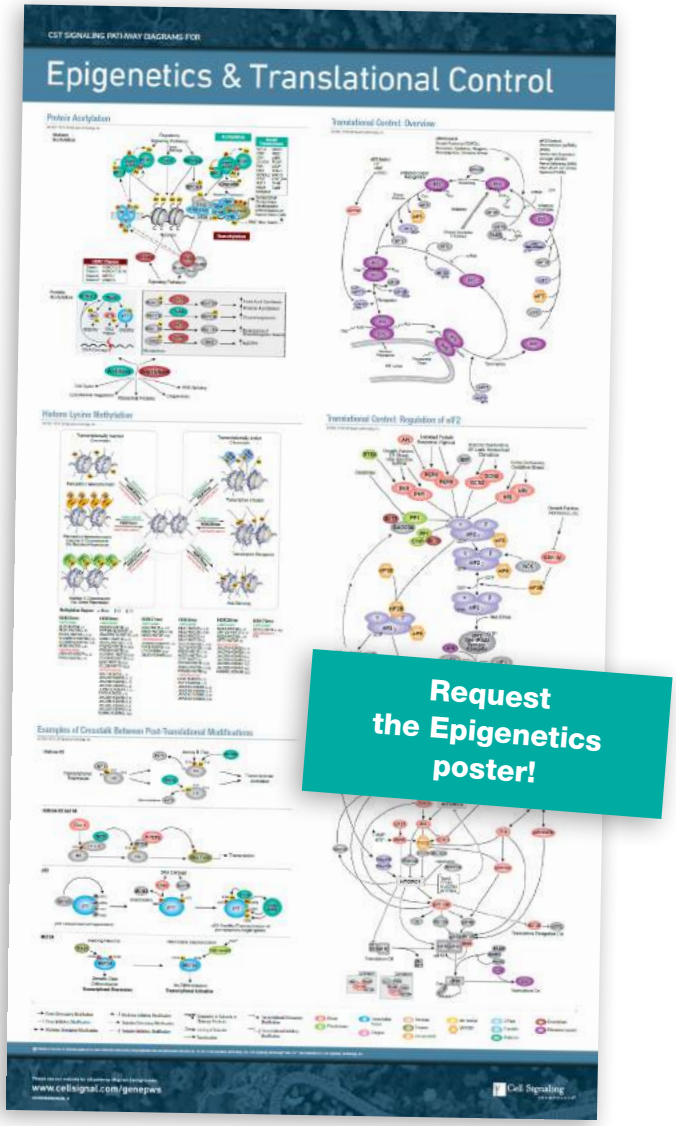
Sonication is a popular choice for preparing chromatin for ChIP. However, most protocols require subjecting the chromatin to harsh, denaturing conditions (i.e., high heat, detergent, and shearing force) that can damage both antibody epitopes and the integrity of the chromatin.

CST provides multiple options for avoiding the problems of traditional sonication protocols:

Sonication: CST's sonication protocol uses specially formulated cell and nuclear lysis buffers. This approach protects chromatin integrity and antibody epitopes, resulting in increased ChIP efficiency and making it more compatible for use with transcription factors and cofactors, which are labile and have less stable DNA interactions.

Enzymatic digestion: Enzymatic digestion is an alternative method of chromatin fragmentation that is compatible with all target types and highly amenable to the immunoprecipitation of transcription factors and cofactors. This approach uses micrococcal nuclease to cut the linker region between nucleosomes. Additionally, it is simple to control and protects chromatin and antibody epitopes from shearing or denaturation, making it an ideal option for users who are new to performing ChIP.

The CST SimpleChIP kits for sonication or enzymatic digestion, both outperform traditional sonication when assessing either transcription factors or cofactors.

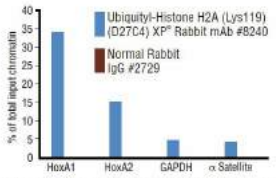


Cat#	
#9927	Acetyl-Histone H3 Antibody Sampler Kit
#65816	Class I HDAC Antibody Sampler Kit H, M, R, Mk
#79891	Class II HDAC Antibody Sampler Kit H, M, R
#9787	Sirtuin Antibody Sampler Kit
#56383	SimpleChIP® Plus Sonication Chromatin IP Kit (Magnetic Beads) ChIP, ChIP-seq
#9005	SimpleChIP® Plus Enzymatic Chromatin IP Kit (Magnetic Beads) ChIP, ChIP-seq
#9003	SimpleChIP® Enzymatic Chromatin IP Kit (Magnetic Beads) ChIP, ChIP-seq

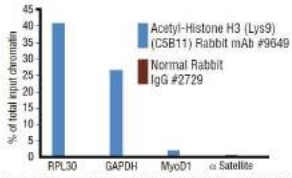
ChIP validated antibodies

- All ChIP-seq approved antibodies from CST are recombinant rabbit monoclonal antibodies, providing greater lot-to-lot reproducibility
- Antibodies are validated and optimized using the SimpleChIP Enzymatic Chromatin IP protocol, saving you time and money
- Antibodies are tested and validated for target specificity across multiple applications, providing reduced non-specific binding and high signal-to-noise ratio in ChIP and ChIP-seq
- Antibodies are compatible with other ChIP and ChIP-seq protocols, allowing for use in ChIP kits from CST or other suppliers, and in customized lab protocols

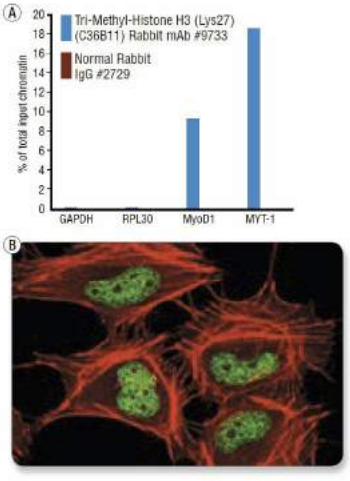
Cat#	ANTIBODIES	APPLICATIONS	REACTIVITY
#12349	Histone H2A (D6O3A) Rabbit mAb	WB, IF-IC, ChIP	H, M, R, Mk, Z, (Hm, B, Dg)
#2576	Acetyl-Histone H2A (Lys5) Antibody	WB, IP, IHC-P	H, M, R, Mk
#8240	Ubiquityl-Histone H2A (Lys119) (D27C4) XP® Rabbit mAb	WB, IP, ChIP	H, M, R, Mk
#7631	Histone H2A.X (D17A3) XP® Rabbit mAb	WB, IHC-P, IF-IC	H, M, R, Mk
#9718	Phospho-Histone H2A.X (Ser139) (20E3) Rabbit mAb	WB, IHC-P, IF-IC, F	H, M, R, Mk
#2718	Histone H2A.Z Antibody	WB, IP, IF-IC	H, M, R, Mk, Z, (C, X, B)
#12364	Histone H2B (D2H6) Rabbit mAb	WB, IHC-P, ChIP	H, M, R, Mk, (C, Z, B)
#12799	Acetyl-Histone H2B (Lys5) (D5H1S) XP® Rabbit mAb	WB, IP, IHC-P, IF-IC, ChIP	H, M, R, Mk, (Hm, C, Z, B, Hr)
#9083	Acetyl-Histone H2B (Lys15) (D8H1) XP® Rabbit mAb	WB, IP, IF-IC, ChIP	H, M, R, Mk, (Z, B, Pg, Hr)
#5546	Ubiquityl-Histone H2B (Lys120) (D11) XP® Rabbit mAb	WB, ChIP	H, M, R, Mk
#4499	Histone H3 (D1H2) XP® Rabbit mAb	WB, IHC-P, IF-IC, F	H, M, R, Mk, (Hm, C, Dm, X, Z, B)
#4620	Histone H3 (D2B12) XP® Rabbit mAb (ChIP Formulated)	ChIP	H, M, (R, Hm, C, Dm, X, Z, B)
#9706	Phospho-Histone H3 (Ser10) (6G3) Mouse mAb	WB, IF-F, IF-IC, F	H, M, R
#9701	Phospho-Histone H3 (Ser10) Antibody	WB, IP, IHC-P, IHC-F, IF-IC, F	H, M, R, Mk, Dm, Z, Sc, (X)
#9713	Phospho-Histone H3 (Ser28) Antibody	WB, IP, IF-F, IF-IC, F	H, M, Hm, Dm, (R, C, X, Z, B)
#9649	Acetyl-Histone H3 (Lys9) (C5B11) Rabbit mAb	WB, IP, IHC-P, IF-IC, F, ChIP	H, M, R, Mk, Z, Ce, (Sc)
#9677	Acetyl-Histone H3 (Lys9/Lys14) Antibody	WB, IP, IHC-P, IF-IC, ChIP	H, M, R, Mk, Ce, (Z)
#7627	Acetyl-Histone H3 (Lys14) (D4B9) Rabbit mAb	WB, IP, ChIP	H, M, R, Mk, (Hm, Dm, X, Z, Pg, Sc, Hr)
#13998	Acetyl-Histone H3 (Lys18) (D8Z5H) Rabbit mAb	WB, IP, IHC-P, F, ChIP	H, M, R, Mk, Sc, (Hm, Pg)
#8173	Acetyl-Histone H3 (Lys27) (D5E4) XP® Rabbit mAb	WB, IF-IC, ChIP	H, M, R, Mk, (Hm, X, Z, Hr)
#5326	Mono-Methyl-Histone H3 (Lys4) (D1A9) XP® Rabbit mAb	WB, IF-IC, ChIP	H, M, R, Mk, (Dm)
#14186	Mono-Methyl-Histone H3 (Lys9) (D1P5R) Rabbit mAb	WB, IP, IF-IC, ChIP	H, M, R, Mk, (X, Z, Pg, Sc, Hr)
#14111	Mono-Methyl-Histone H3 (Lys36) (D9J1D) Rabbit mAb	WB, IP, ChIP	H, M, R, Mk, (Hm, B)
#12522	Mono-Methyl-Histone H3 (Lys79) (D5X1S) Rabbit mAb	WB, ChIP	H, M, R, Mk
#9725	Di-Methyl-Histone H3 (Lys4) (C64G9) Rabbit mAb	WB, IP, IHC-P, IF-IC, ChIP	H, M, R, Mk
#4658	Di-Methyl-Histone H3 (Lys9) (D85B4) XP® Rabbit mAb	WB, IP, IF-IC, ChIP	H, M, R, Mk, (Dm, X, Z, B, Pg, Sc, Ce)
#9728	Di-Methyl-Histone H3 (Lys27) (D18C8) XP® Rabbit mAb	WB, IP, IF-IC, F, ChIP	H, M, R, Mk
#2901	Di-Methyl-Histone H3 (Lys36) (C75H12) Rabbit mAb	WB, IHC-P, IF-IC	H, M, R, Mk
#5427	Di-Methyl-Histone H3 (Lys79) (D15E8) XP® Rabbit mAb	WB, ChIP	H, M, R, Mk
#5327	Di/Tri-Methyl-Histone H3 (Lys9) (6F12) Mouse mAb	WB, IP, IF-IC, ChIP	H, M, R, Mk
#9751	Tri-Methyl-Histone H3 (Lys4) (C42D8) Rabbit mAb	WB, IHC-P, IF-IC, F, ChIP	H, M, R, Mk, Dm, Sc, (X, Z)
#13969	Tri-Methyl-Histone H3 (Lys9) (D4W1U) Rabbit mAb	WB, IP, IF-IC, ChIP	H, M, R, Mk, (B)
#9733	Tri-Methyl-Histone H3 (Lys27) (C36B11) Rabbit mAb	WB, IP, IHC-P, IF-IC, F, ChIP	H, M, R, Mk, (X, Z)
#4909	Tri-Methyl-Histone H3 (Lys36) (D5A7) XP® Rabbit mAb	WB, ChIP	H, M, R, Mk, (Hm, C, Dm, X, Z, B)
#9763	Tri-Methyl-Histone H3 (Lys36) Antibody	WB, IHC-P, IF-IC	H, M, R, Mk
#4473	Pan-Methyl-Histone H3 (Lys9) (D54) XP® Rabbit mAb	WB, IP, IF-IC, F, ChIP	H, M, R, Mk, (C, Dm, X, Z, B, Pg, Sc, Ce)
#13919	Histone H4 (D2X4V) Rabbit mAb	WB, IHC-P, IF-IC	H, M, R, Mk, (Hm, C, B)
#8647	Acetyl-Histone H4 (Lys5) (D12B3) Rabbit mAb	WB, IP, IHC-P, IF-IC, ChIP	H, M, R, Mk, (C, Dm, X, Z, B, Pg, Hr, Ce)
#2594	Acetyl-Histone H4 (Lys8) Antibody	WB	H, M, R, Mk, (Ce)
#13944	Acetyl-Histone H4 (Lys12) (D2W6O) Rabbit mAb	WB, IP, IF-IC, F, ChIP	H, R, Mk, (C, Dm)
#13534	Acetyl-Histone H4 (Lys16) (E2B8W) Rabbit mAb	WB, IP, IF-IC, ChIP	H, M, R, Mk
#9724	Mono-Methyl-Histone H4 (Lys20) Antibody	WB	H, M, R, Mk, (Dm, X, Z, B, Pg, Hr, Ce)
#5737	Tri-Methyl-Histone H4 (Lys20) (D84D2) Rabbit mAb	WB, ChIP	H, M, R, Mk, (X, B, Pg)



Ubiquityl-Histone H2A (Lys119) (D27C4) XP® Rabbit mAb #8240: Chromatin IPs were performed with cross-linked chromatin from 4 x 10^6 NCCIT cells and either 10 µl of #8240 or 2 µl of Normal Rabbit IgG #2729 using SimpleChIP® Enzymatic Chromatin IP Kit (Magnetic Beads) #9003 and primers to the designated loci.



Acetyl-Histone H3 (Lys9) (C5B11) Rabbit mAb #9649: Chromatin IPs were performed with cross-linked chromatin from 4 x 10^6 HeLa cells and either 10 µl of #9649 or 2 µl of Normal Rabbit IgG #2729 using SimpleChIP® Enzymatic Chromatin IP Kit (Magnetic Beads) #9003 and primers to the designated loci.



Tri-Methyl Histone H3 (Lys27) (C36B11) Rabbit mAb #9733: Chromatin IPs **(A)** were performed with cross-linked chromatin from 4 x 10^6 HeLa cells and either 10 µl of #9733 or 2 µl of Normal Rabbit IgG #2729 using SimpleChIP® Enzymatic Chromatin IP Kit (Magnetic Beads) #9003 and primers to the designated loci. IF analysis **(B)** of HeLa cells using #9733 (green). Actin filaments have been labeled with DyLight™ 554 Phalloidin #13054 (red).

Cayman Chemical

Cayman Chemical supplies scientists worldwide with the resources necessary for advancing human and animal health. Cayman manufacture high quality biochemicals, assay kits, antibodies, and recombinant proteins and offer contract services for custom chemical synthesis/analysis, assay development/screening, and drug discovery.

Inhibitors available from Cayman:

Writer inhibitors – Inhibitors of enzymes that place epigenetics marks on proteins, including methyl- and acetyltransferases, as well as arginine deiminases	*DNA Methyltransferases (DNMTs), Histone Acetyltransferases (HATs), Lysine Methyltransferases (KMTs), Protein Arginine Deiminases (PADs), Protein Arginine Methyltransferases (PRMTs)*
Eraser inhibitors – Inhibitors of enzymes that remove epigenetics marks, including deacetylases, demethylases, and sirtuins.	*Histone Deacetylases (HDACs), Sirtuins (SIRTs), Lysine Demethylases (KDMs)*
Reader inhibitors – Inhibitors of proteins containing dedicated domains, including bromodomains, chromodomains, and MBT domains, for binding specific epigenetic marks on other proteins, DNA, or RNA.	*Bromodomains (BRDs), Chromodomain (CB, MBTs)*

DNA/RNA Antibodies

Cat#	Product	Application
#20722	Anti-5-methyl Cytosine Rabbit Monoclonal Antibody (Clone RM231)	Dot blot, ELISA, ICC, IHC, MeDIP
#20723	Anti-5-hydroxy Methylcytosine Rabbit Monoclonal Antibody (Clone RM236)	Dot blot, ELISA, ICC, IHC, hMeDIP
#18289	5-Hydroxymethylcytosine Polyclonal Antibody	Dot blot, ELISA
#18336	N6-Methyladenosine Monoclonal Antibody (Clone 17-3-4-1)	Dot blot, ELISA, IP
#18337	N6-Methyladenosine Polyclonal Antibody	ELISA, Southwestern dot blot

PROTEINS FOR EPIGENETIC STUDIES

Recombinant proteins, expressed and purified from E. coli, Sf9, or Sf21 insect cells for epigenetic readers, writers, and erasers.

Additional inhibitors and proteins for epigenetic research can be found on **www.caymanchem.com**

SGC Probe Set
Item No. 17748
- Contains >20 inhibitors/antagonists of epigenetic readers, writers, and erasers that have been developed or curated by the Structural Genomics Consortium
- Designed for preclinical target validation

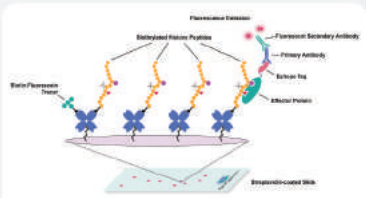
Epigenetics Screening Library (96-Well)
Item No. 11076
- Contains >140 small molecules
- Includes compounds that modulate the activity of methyltransferases, demethylases, HATs, HDACs, and acetylated lysine reader proteins

Rapidly screen epigenetic protein interactions with modified histones

EpiTitan™ Histone Peptide Array 17626

This EpiTitan™ Histone Peptide Array platform is designed for rapid semi-quantitative and high-throughput analysis of the binding specificity of antibodies and histone binding effector proteins. It can also be used to determine the substrate specificity of histone-modifying enzymes.

- Array covers over 95 unique modifications on the four core histones
- Perform multiple experiments per array
- Determine the specificity of histone binding proteins, the selectivity of histone antibodies, and identify substrates for histone-modifying enzymes



EpiTitan™ Histone Peptide Array slide design. For detection of the interaction of an effector protein with peptides on the array as shown above, you need a primary antibody to the protein (or to an affinity tag) and a fluorescently labeled secondary antibody to the primary antibody. This is much like the detection procedure employed in immunofluorescence microscopy. For analysis of histone antibody specificity, you need the primary antibody to a histone modification to be studied and a fluorescently labeled secondary antibody recognizing the primary antibody.

Lonza

iPSC Generation via Reprogramming of Somatic Cells

Lonza's Nucleofector™ Technology has been demonstrated to be a convenient, efficient, and cost-effective non-viral alternative for iPSC generation and is currently being used by leading scientists around the world. Induced PSCs can simply be generated in the lab via introducing stem cell specific transcription factors into primary somatic cells by either viral transduction or non-viral transfection. Typical reprogramming factors used in different combinations are Oct4, Sox2, Klf4, c-Myc, Nanog and Lin28.

Benefits of the Nucleofector™ Technology for iPSC generation include:

- Simple, single-step procedure to introduce episomal vectors or RNA
- Integration-free, footprint-free reprogramming
- Successfully tested for generation of iPSCs from various cell types
- Also proven for efficient iPSC transfection, e.g. for genome editing using ZFN, TALEN, and CRISPR systems

Origene

UltraMAB™

UltraMAB®, the Ultra Specific Antibody
Validated against > 10,000 human antigens

Some commonly used diagnostic antibodies perform well in applications but cross-react with other unrelated proteins. This cross-reactivity may potentially cause unexpected side effects and generate false diagnostic reports. OriGene is proud to announce the development of High-Density Protein Microarray for antibody specificity testing.

Using this protein microarray technology with over-expressed proteins has been applied to identify UltraMAB®, the ultra specific antibodies for cancer biomarkers, transcription factors and other important diagnostic targets.

Major applications of validation for UltraMAB® include:

- Mono-specificity test
- WB with cell lines and tissue lysates
- IHC staining with over 25 types of normal and cancer human tissues
- IF/ICC
- FACS

Anti-human UltraMAB Transcription factors for ChIP analysis

Product nr	Transcription factor
UM870020	FOXP1
UM570081	ZNF447
UM570065	ERG
UM870113	c Fos
UM570077	PBX1
UM800005	c-Jun
UM500053	p53

Rockland

Epi-Plus™ Antibodies

Rockland's Epi-Plus™ line of highly specific antibodies recognize modified histones and related cellular targets and are validated by multiple assays. Epi-Plus™ antibodies are extremely sensitive and specific to the modification and show no cross-reactivity to other modifications on the same site or other amino acids of the protein.

Epi-Plus™ antibodies are validated for immunofluorescence microscopy (IF), immunoprecipitation (IP), chromatin immunoprecipitation (ChIP), immunohistochemistry (IHC) and Western blot (WB) analysis.

Recommended Epi-Plus™ Antibodies:

For Histone 3 K4 methylations use	
Anti-Histone H3 [Monomethyl Lys4] (RABBIT) Antibody	600-401-I57
Anti-Histone H3 [Dimethyl Lys4] (RABBIT) Antibody	600-401-I58
Anti-Histone H3 [Trimethyl Lys4] (RABBIT) Antibody	600-401-I59

Eurogentec

Custom oligonucleotides and reagents for gene expression studies

RNA oligonucleotides are mainly used to study the involvement of RNA in gene regulation. Synthetic siRNA duplexes are introduced into cells to cause RNA interference and inhibit the expression of a specific messenger RNA (mRNA). In contrast miRNAs are able to regulate the expression of several mRNAs. They can be inhibited by synthetic single stranded RNAs acting as miRNA antagonists. On the other hand synthetic miRNAs or miRNA mimics can be used in order to induce the degradation of the mRNA and consequently induce the gene silencing effect.

Takyon qPCR Kits

Emerging from the combination of an optimized reaction buffer and a new efficient enzyme, Takyon™ kits for qPCR Assays ensure sensitivity and fast delivery of accurate and reproducible results!

Available as easy ready to use MasterMixes, Takyon™ qPCR for Probe or SYBR® Assays are available for all platforms.

RNA oligonucleotides specifications

- Length**: From 5 to 59 bases
- Synthesis scale: 10 nmol • 40 nmol • 200 nmol • 1000 nmol**
- Backbone: RNA, LNA®, 2'O-Me RNA, 2'O-MOE RNA and all linkages
- Modifications:
  - » 5': Phosphate, 6-FAM, CyR3, Cy5R, TET, HEX,...
  - » 3': DABCYL, TEG-Cholesteryl, TAMRA...
- Purification: SePOP Desalting or IEX-RP/HPLC
- Quality Control: MALDI-TOF MS
- Format: Dried
- Packaging: 2 mL tube
- Documentation: Technical data sheet
- siRNA Design: Free and guaranteed
- Shipping: At room temperature

Product	Cat#	Size
Takyon ROX SYBR 2X MasterMix dTTP blue	UF-RSMT-B0701	750 rxn (7.5 ml)
Takyon No ROX SYBR 2X MasterMix blue dTTP	UF-NSMT-B0701	750 rxn (7.5 ml)
Takyon Low ROX SYBR 2X MasterMix blue dTTP	UF-LSMT-B0701	750 rxn (7.5 ml)
Takyon ROX Probe 2X MasterMix dTTP blue	UF-RPMT-B0701	750 rxn (7.5 ml)
Takyon Low ROX Probe 2X MasterMix dTTP blue	UF-LPMT-B0701	750 rxn (7.5 ml)
Takyon No ROX Probe 2X MasterMix Blue dTTP	UF-NPMT-B0701	750 rxn (7.5 ml)