- ChIPmentation
- Low input ChIP
- ChIP for transcription factors and histones
- Plant ChIP
- ChIP on FFPE samples
- ChIP on tissue samples
- Chromatin shearing
- ChIP and ChIP-seq grade antibodies
- DNA purification
- Library preparation
Diagenode helps you master ChIP and ChIP-seq

With 15 years experience in ChIP assay development Diagenode has built unmatched expertise in chromatin analysis. Our efforts have focused on the development of unique and robust epigenetic solutions, providing you with complete, validated solutions for your ChIP-qPCR and ChIP-seq assays, all-in-one ChIPmentation, as well as epigenetic services.

What is ChIP?

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 involves the selective enrichment of a chromatin fraction containing a specific antigen. Antibodies that recognize a specific protein or protein modification are used to determine the relative abundance of that antigen at a specific locus or loci.

ChIP-qPCR

ChIP coupled with qPCR can be used to study protein-DNA interactions at known genomic binding sites. ChIP-qPCR is advantageous for studies that focus on specific genes and regulatory regions across differing experimental conditions.

ChIP-seq

ChIP-seq combines ChIP with massively parallel DNA sequencing to identify and precisely map protein-DNA binding sites at a genome-wide level.
ChIP is at your fingertips

With an exclusive focus on epigenetics, Diagenode provides the highest quality epigenetics products on the market. Our complete suite of ChIP and ChIP-seq solutions includes extensively validated ChIP and ChIP-seq grade antibodies, chromatin shearing devices (Bioruptor®), kits for chromatin shearing optimization, specialized kits for ChIP and ChIP-seq as well as for library preparation.

Optimal solutions for your end-to-end ChIP

Automation

Automate your complex ChIP experiments with our IP-Star® Compact liquid handling platform for increased reproducibility and for reduced operator handling.

Epigenomic Services

Let our epigenetic experts help you achieve! We provide you with personalized end-to-end epigenomics services supporting your research from the experimental design to the final analysis of your data.
Chromatin preparation

A successful chromatin preparation relies on the optimization of cross-linking, cell lysis and sonication. Our Chromatin Shearing Optimization Kits together with the Bioruptor ultrasonicator combine efficient cell lysis and chromatin shearing leading to consistent results.

Each Chromatin Shearing Optimization Kit provides optimized reagents and a thoroughly validated protocol according to your specific experimental needs. SDS concentration is adapted to each workflow taking into account target-specific requirements.

- Obtain perfect fragment size for high quality ChIP
- Keep the epitopes accessible to the antibody
- Get consistent results from different samples and runs
- Benefit from the optimal kit for your specific experimental needs

<table>
<thead>
<tr>
<th>KIT</th>
<th>Chromatin Shearing Optimization Kit Ultra Low SDS</th>
<th>Chromatin Shearing Optimization Kit Low SDS</th>
<th>Chromatin Shearing Optimization Kit for Plant</th>
<th>Chromatin Shearing Optimization Kit High SDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat. No.</td>
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<td>C01020013</td>
<td>C01020014</td>
<td>C01020012</td>
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<tr>
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<td>Cells, tissue</td>
<td>Plant tissue</td>
<td>Cells</td>
</tr>
<tr>
<td>Target</td>
<td>Histones</td>
<td>TF</td>
<td>Histones</td>
<td>Cells</td>
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<td>Yes</td>
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<td>SDS concentration</td>
<td>&lt; 0.1%</td>
<td>0.2%</td>
<td>0.5%</td>
<td>1%</td>
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<td>Corresponding to shearing buffers from</td>
<td>• iDeal ChIP-seq Kit for Histones</td>
<td>• iDeal ChIP-seq Kit for Transcription Factors</td>
<td>• iDeal ChIP qPCR Kit</td>
<td>• Universal Plant ChIP-seq Kit</td>
</tr>
</tbody>
</table>

The shearing device of choice for chromatin preparation for ChIP

The Bioruptor is the latest innovation in shearing and represents a new breakthrough as all-in-one shearing system that delivers optimal and reproducible chromatin shearing while preserving high protein integrity.

Visit our website to learn more about our different models of Bioruptor and their features.
Chromatin immunoprecipitation kits

Diagenode’s optimized, high performance ChIP kits are the result of over 15 years of research and development. We provide a flexible platform that addresses specific research needs with a vast array of optimized ChIP kits.

Choose the right kit for your experiment:

Which ChIP kit is right?

- **Cell/Tissue**
  - qPCR
  - NGS
- **FFPE**
  - qPCR/NGS* (for iDeal ChIP-FFPE Kit)
- **Plant**
  - qPCR/NGS
  - Universal Plant ChIP-seq Kit

**Application**
- iDeal ChIP-qPCR Kit
- iDeal ChIP-FFPE Kit

**Target**
- Histones
- Transcription Factors

**Library prep**
- Rapid ChIP and library prep incorporated in one step
- Standard Library prep performed after ChIP

*The quality of sequencing data depends on the quality of the FFPE sample*
✓ Complete kits
✓ Optimized robust protocols
✓ Magnetic beads for more reproducible results
✓ Perfect match of sequencing results with reference dataset
✓ Many species tested (human, mouse, rat, horse, chicken, cow, pig, plants and more)
A quick glance: ChIP kit features

<table>
<thead>
<tr>
<th>Downstream application</th>
<th>NGS</th>
<th>qPCR</th>
<th>NGS</th>
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</thead>
<tbody>
<tr>
<td>Starting material: cells per 1 chromatin prep</td>
<td>700 K - 7 M</td>
<td>H: 700 K - 7 M TF: 25 M</td>
<td>700 K - 7 M</td>
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<tr>
<td>Number of cells per 1 IP</td>
<td>5 K - 1 M</td>
<td>H: 100 K - 1 M TF: 4 M</td>
<td>100 K - 1 M</td>
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<tr>
<td>Starting material: tissue per 1 chromatin prep</td>
<td>-</td>
<td>H: 20 mg - 30 mg TF: 200 mg</td>
<td>20 mg - 30 mg</td>
</tr>
<tr>
<td>Amount of tissue per 1 IP</td>
<td>-</td>
<td>H: 1.5 - 5 mg TF: 30 mg</td>
<td>1.5 - 5 mg</td>
</tr>
<tr>
<td>Target</td>
<td>Histones</td>
<td>Histones, TF</td>
<td>Histones</td>
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<tr>
<td>Included buffers</td>
<td>Cell lysis, Chromatin shearing, Immunoprecipitation</td>
<td>Cell lysis, Chromatin shearing, Immunoprecipitation</td>
<td>Cell lysis, Chromatin shearing, Immunoprecipitation</td>
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<tr>
<td>DNA purification</td>
<td>na</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Control antibodies</td>
<td>IgG, H3K4me3</td>
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<td>IgG, H3K4me3</td>
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<tr>
<td>Control primers</td>
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<td>Human: (+)GAPDH TSS, (-)Myoglobin exon 2</td>
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<td>Library prep reagents</td>
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<td>Separately in MicroPlex Lib Prep or iDeal Lib Prep</td>
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<tr>
<td>Indexes</td>
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<td>Compatible Chromatin Shearing Optimization Kit</td>
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<td>C01020013</td>
<td>C01020010</td>
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## KIT

<table>
<thead>
<tr>
<th></th>
<th>iDeal ChIP-seq for TF</th>
<th>True MicroChIP</th>
<th>iDeal ChIP-FFPE Kit</th>
<th>Universal Plant ChIP-seq</th>
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<td></td>
<td>NGS</td>
<td>qPCR, NGS</td>
<td>qPCR, NGS</td>
<td>qPCR, NGS</td>
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<tr>
<td>25 M</td>
<td>20 K - 100 K</td>
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<td>-</td>
<td>-</td>
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<td>4 M</td>
<td>10 K - 100 K</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td>200 mg</td>
<td>-</td>
<td>up to 6 slides</td>
<td>0.1 - 2 g</td>
<td></td>
</tr>
<tr>
<td>30 mg</td>
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<td>0.007 - 0.13 g</td>
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<tr>
<td>TF</td>
<td>Histones</td>
<td>Histones, TF</td>
<td>Histones</td>
<td></td>
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<td></td>
<td>Cell lysis, Chromatin shearing, Immunoprecipitation</td>
<td>Separately in MicroPlex Lib Prep</td>
<td>Separately in MicroPlex Lib Prep</td>
<td>Separately in MicroPlex Lib Prep</td>
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<tr>
<td></td>
<td>-</td>
<td>Separately - MicroChIP DiaPure columns C03040001</td>
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<tr>
<td></td>
<td>IgG, CTCF</td>
<td>IgG, H3K4me3</td>
<td>-</td>
<td>IgG, H3K4me3</td>
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<tr>
<td>Human: (+)H19, (-)Myoglobin exon 2</td>
<td>Human: (+)GAPDH TSS, (-)Myoglobin exon 2</td>
<td>-</td>
<td>Arabidopsis: (+)FLC-ATG, (-)FLC-Intron1</td>
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<tr>
<td></td>
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<td>Separately in MicroPlex Lib Prep</td>
<td>Separately in MicroPlex Lib Prep</td>
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<td>C01020012</td>
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<td></td>
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<td>✓</td>
<td>✓</td>
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</tr>
</tbody>
</table>
Library preparation kits

Diagenode’s library preparation kits have been extensively validated with ChIP-seq samples. The MicroPlex Library Preparation Kit, which uses a simple 3-step protocol, is an optimal choice for library preparation, especially for very low inputs of DNA down to 50 pg. Moreover, the kits are available with either single or dual index options. For standard DNA inputs, the iDeal Library Preparation Kit can be also used.

<table>
<thead>
<tr>
<th>KIT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MicroPlex Library Preparation</strong></td>
</tr>
<tr>
<td>Sample</td>
</tr>
<tr>
<td>Input</td>
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<tr>
<td>Protocol</td>
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<tr>
<td>Hands on time</td>
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<tr>
<td>Intermediate purification</td>
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<tr>
<td>Sequencing technology</td>
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<tr>
<td>Indexes</td>
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<tr>
<td>Multiplexing</td>
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<tr>
<td>Indexes</td>
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<tr>
<td>Included in the kit</td>
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<tr>
<td>Manual protocol</td>
</tr>
<tr>
<td>Automated protocol</td>
</tr>
</tbody>
</table>

**MicroPlex Library Preparation kit v3 - with dual indexes**

- **KITS**:
  - C05010001 - MicroPlex Lib. Prep Kit v3 /48 rxns
  - C05010002 - MicroPlex Lib. Prep Kit v3 /96 rxns

- **DUAL INDEXES**:
  - C05010003 - 24 Dual indexes for MicroPlex Kit v3 /48 rxns
  - C05010004 - 96 Dual indexes for MicroPlex Kit v3 – Set I /96 rxns
  - C05010005 - 96 Dual indexes for MicroPlex Kit v3 – Set II /96 rxns
  - C05010006 - 96 Dual indexes for MicroPlex Kit v3 – Set III /96 rxns
  - C05010007 - 96 Dual indexes for MicroPlex Kit v3 – Set IV /96 rxns

- *The dual indexes are not included in the kits.*

**MicroPlex Library Preparation Kit v2 - with single indexes**

- C05010012 - MicroPlex Lib. Prep Kit v2 (12 indexes) /12 rxns
- C05010013 - MicroPlex Lib. Prep Kit v2 (12 indexes) /48 rxns
- C05010014 - MicroPlex Lib. Prep Kit v2 (48 indexes) /48 rxns

**iDeal Library Preparation Kit – with single indexes**

- C05010020 - iDeal Lib. Prep Kit x24 (incl. Index Primer Set 1)
- C05010021 - Index Primer Set 2 (iDeal Lib. Prep Kit x24)
How the MicroPlex Library Preparation Kit Works

**STEP 1** Template preparation

Template:
Fragmented dsDNA/cDNA

DNA Repair

**STEP 2** Library synthesis

Stem-loop Adaptor

3' 5'

3' 5'

Addition of Adaptors

Blunt-end Ligation

Nick

5' Nick

Cleavable Replication Stop

**STEP 3** Library amplification

Extension and Cleavage

Barcode

Primer A

High Fidelity Amplification

Barcode

Primer B

Microplex workflow - protocol with dual indexes.

An input of 50 pg to 50 ng of fragmented dsDNA is converted into sequencing-ready libraries for Illumina® NGS platforms using a fast and simple 3-step protocol.
ChIPmentation

Diagenode’s unique ChIPmentation technology, based on tagmentation, enables the integration of library preparation during ChIP itself using a transposase loaded with sequencing adaptors. Unlike standard library preparation techniques that require many steps, ChIPmentation incorporates an easier and shorter protocol. Moreover, this reduced number of steps allows successful IPs on lower amounts of chromatin, which makes it ideal to analyze numerous histone marks on each chromatin sample.

- Easier and faster than classical ChIP-seq
- Validated for various histone marks
- Ideal for analysis of large cohorts of samples
- Ideal for analysis of large number of marks on a unique sample
- High quality sequencing data

ChIPmentation sequencing results obtained from decreasing starting amounts of cells.

Chromatin preparation has been performed on 7 M K562 cells using the ChIPmentation Kit for Histones (Cat. no. C01011010). Diluted chromatin from 100,000, 10,000 and 5,000 cells was used for the immunoprecipitation with the Diagenode antibody targeting H3K4me3 (Cat. no. C15410003). A. Distribution of the ChIPmentation readsets in a representative region of the genome. B., C. and D. Comparison of the top 40% peaks from 100,000 (B.), 10,000 (C.) and 5,000 (D.) cells with ENCODE dataset.
ChIPmentation workflow

**Cell collection and DNA-protein cross-linking**

Day 1

**Cell lysis and chromatin shearing**

Day 1

**Magnetic immunoprecipitation**

Day 1-2

**Tagmentation: one step adaptor insertion into chromatin**

Day 1-2

**Stripping, end-repair and reverse cross-linking**

Day 2

**Library amplification**

Day 2

**Clean-up**

Day 3

**Quality control**

**Sequencing**

**LIBRARY PROCESSING**

**STEP 4**

**STEP 5**

**STEP 6**

**STEP 7**

**CHROMATIN PREPARATION**

**STEP 1**

**STEP 2**

**IP & TAGMENTATION**

**STEP 3**

**LEGEND**

- Protein of interest
- Other protein
- DNA
- Antibody
- Magnetic bead
- Magnet
- Tagmentation Enzyme loaded with adaptors
- Manual processing
- Auto processing

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Kits and reagents highlights

**CHIP ON FFPE SAMPLES**

iDeal ChIP-FFPE Kit

- Fast and user-friendly deparaffinization workflow
- Deparaffinization: less toxic than a conventional xylene-based method
- Easy recovery of re-hydrated tissue due to DiaFilter columns
- Fast chromatin preparation without enzymatic digestion
- A mild de-crosslinking preserves dsDNA
- Eluted DNA suitable for qPCR analysis or other down-stream applications

**CHIP ON PLANT**

Universal Plant ChIP-seq kit

- Specifically optimized for extracting plant chromatin
- Optimized crosslinking (crosslinking bags)
- Compatible with low input
- Higher enrichment
- Higher DNA recovery after ChIP
- Tested on many plant species (tomato, populus, Arabidposis, rice and others)
- Validated with MicroPlex Library Preparation Kit for library prep

**DNA PURIFICATION**

The IPure kit v2 (C03010014 [24 rxns], C03010015 [100 rxns]), based on magnetic beads, is specifically optimized for efficient DNA purification after ChIP.

- Significantly greater yields than with column-based purification
- Recovery of small amounts of DNA
- Straightforward protocol using magnetic beads
- Toxic reagents not used (e.g. phenol/chloroform)
- Provides pure DNA for any downstream application (e.g. NGS)
Other solutions to use with our products or your own protocols

**FIXATION REAGENT FOR INDIRECT PROTEINS**
For proteins not bound directly to DNA, use ChIP Cross-link Gold (Cat. No. C01019027) for efficient protein-protein fixation in higher order or dynamic interactions.

**VALIDATED ANTIBODIES**
- **ChIP and ChIP-seq validation** - As the expert in epigenetics we validate our antibodies in epigenetic applications: ChIP and ChIP-seq
- **Rigorous QC** - Many steps of validation with stringent criteria - only the antibodies which pass QC are added to the catalog
- **Batch-specific data** - Each batch of antibody is validated and the data are presented on the website

Check out the list of our highly validated antibodies at www.diagenode.com

**CHIP NEGATIVE CONTROLS**
Depending on the antibody of interest, choose between rabbit, mouse or rat IgG.

**BEADS**
Extensively validated magnetic and agarose beads validated for isolation of immune complexes in ChIP experiments.

**MAGNETIC RACK**
Use Diagenode’s DiaMag 0.2 ml and/or DiaMag 1.5 ml, for fast and efficient isolation of magnetic beads.

**PRIMER PAIRS**
Check out our list of ChIP/ChIP-seq grade primer pairs on our website.
Shop online in our EpiStore at www.diagenode.com