



SX-8G IP-Star™ Automated System

Bringing unparalleled reproducibility to ChIP and DNA methylation studies





SX-8G IP-Star™ Automated System—the lab workhorse for epigenetic assays

The Diagenode SX-8G IP-Star™ Automated System automates immunoprecipitation and increases reproducibility.

Diagenode, the leading provider of complete solutions for epigenetics research, offers a variety of end-to-end systems to streamline methylation and chromatin immunoprecipitation workflows. Central to this full offering is Diagenode's SX-8G IP-Star Automated System, a simple yet robust semi-automated bench-top instrument that standardizes immunoprecipitation assays for DNA methylation and ChIP. We specifically designed the SX-8G IP-Star to make ChIP and methylation studies accessible and reproducible, to deliver consistent data in every publication. The SX-8G IP-Star will produce consistent results from any operator regardless of the day, the experimental run, or the lab, a major goal of today's high resolution and genome-wide epigenetics studies.

The SX-8G IP-Star replaces the numerous manual, error-prone steps of immunoprecipitation with a reliable, highly-consistent and automated process that requires minimal operator intervention. The SX-8G IP-Star lab "workhorse" allows researchers to achieve higher data reproducibility, more confidence in their results, increased efficiency, greater throughput, and the flexibility to reallocate personnel to more productive tasks. With our automated SX-8G IP-Star workstation, we empower researchers to simplify the tedious protocols and the complexity associated with manual ChIP and DNA methylation workflows. In addition, the SX-8G IP-Star minimizes sample carryover, data variability, and costly errors. The SX-8G IP-Star platform offers full workflow support for epigenetics research, utilizing our complete kits and laboratory-validated protocols to rapidly deliver high-quality and consistent data.

Advantages of the SX-8G IP-Star Automated System

The SX-8G IP-Star, when used with Diagenode's optimized kits for automated epigenetics assays provides:

- **Reproducibility:** Our standardized system and kits provide consistency between runs and users, increasing reproducibility of ChIP and DNA methylation results
- **Speed and accuracy:** Full walk-away automation saves time and eliminates tedious manual steps, minimizing cross-contamination, sample-carryover, and false positive rates
- **Sample efficiency:** Minimal sample loss and smaller reaction volumes allow scientists to use less starting material and eliminates the need for amplification, thus simplifying sample requirements
- **High-throughput capability:** SX-8G IP-Star automation runs up to 16 samples in parallel in less than 10 hours; A second-shift of assays can be run overnight for 24 x 7 system performance
- **Flexibility and scalability:** SX-8G IP-Star software provides an easy-to-use user interface, with open programming of protocols and throughput requirements to adapt protocols to your specific application
- **Ease of use:** Simple interface facilitates proper system set-up and error-free operation
- **Full workflow support:** SX-8G IP-Star automation along with wide selection of epigenetics solutions including Bioruptor® Sonicator for optimal DNA shearing, optimized ChIP and DNA methylation kits, and DNA purification reagents assure data quality
- **Compatibility:** The system is compatible with popular downstream applications including qPCR, microarrays, and high-throughput ("next generation") sequencing

Diagenode offers an end-to-end solution for your entire epigenetics workflow

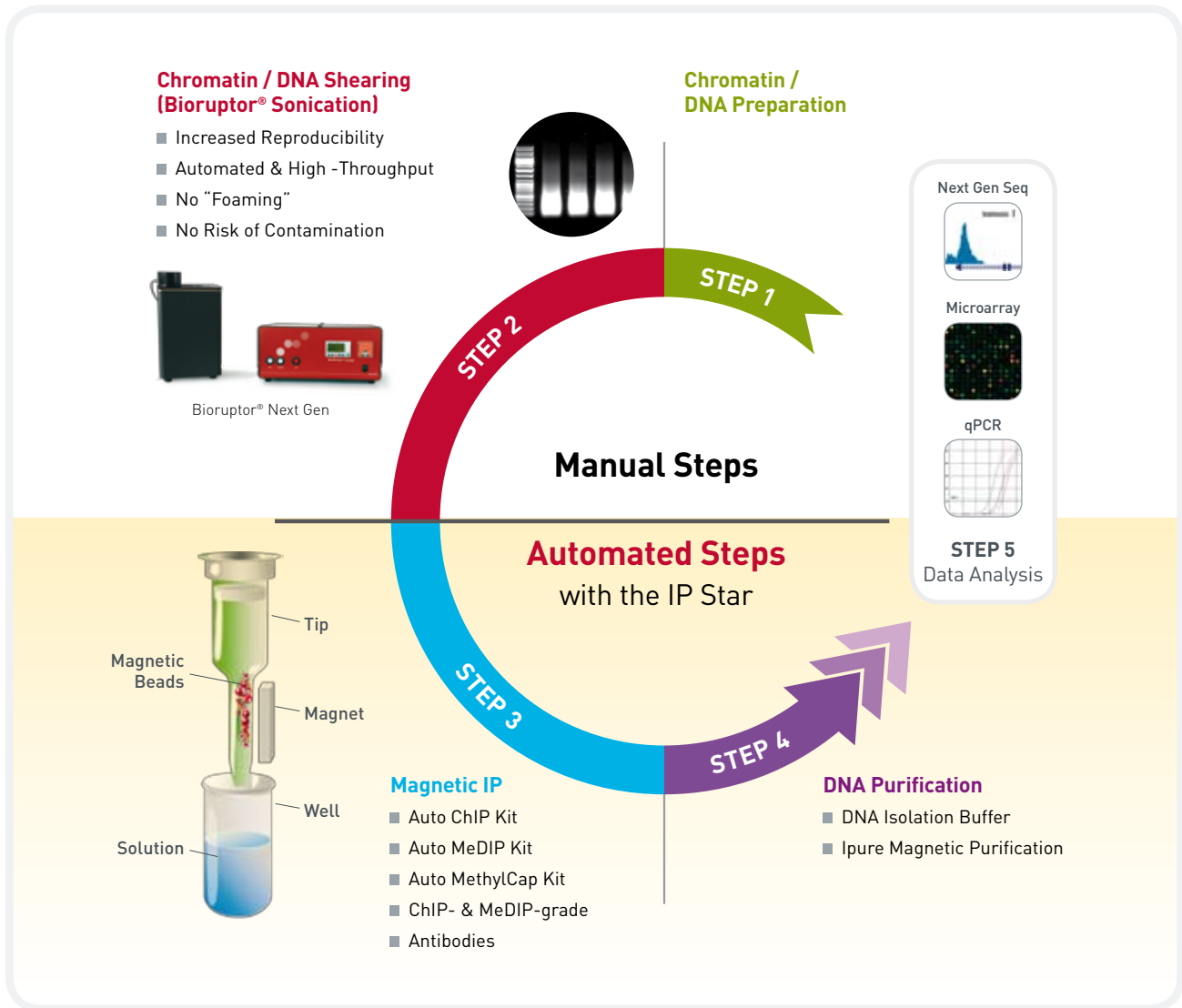


Figure 1. Diagenode offers a full product offering beginning with chromatin preparation kits. Step 1) to reproducible sample shearing with the Bioruptor® product line (Step 2). In Step 3 and 4, the Diagenode IP-Star provides error-free, walk-away automation for all your immunoprecipitation and antibody capture needs.

Customer Feedback

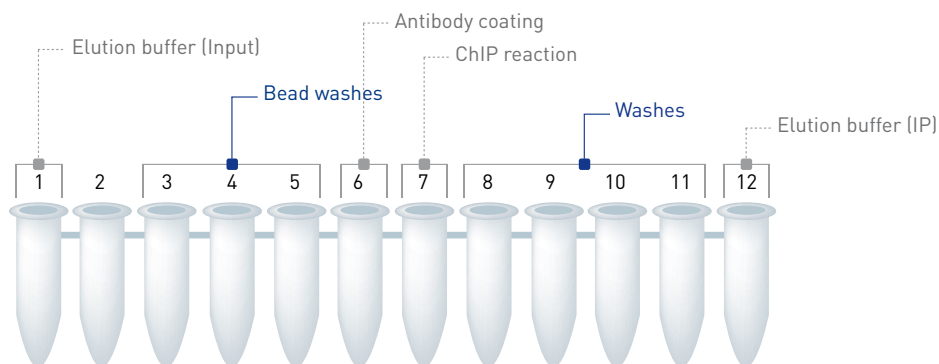
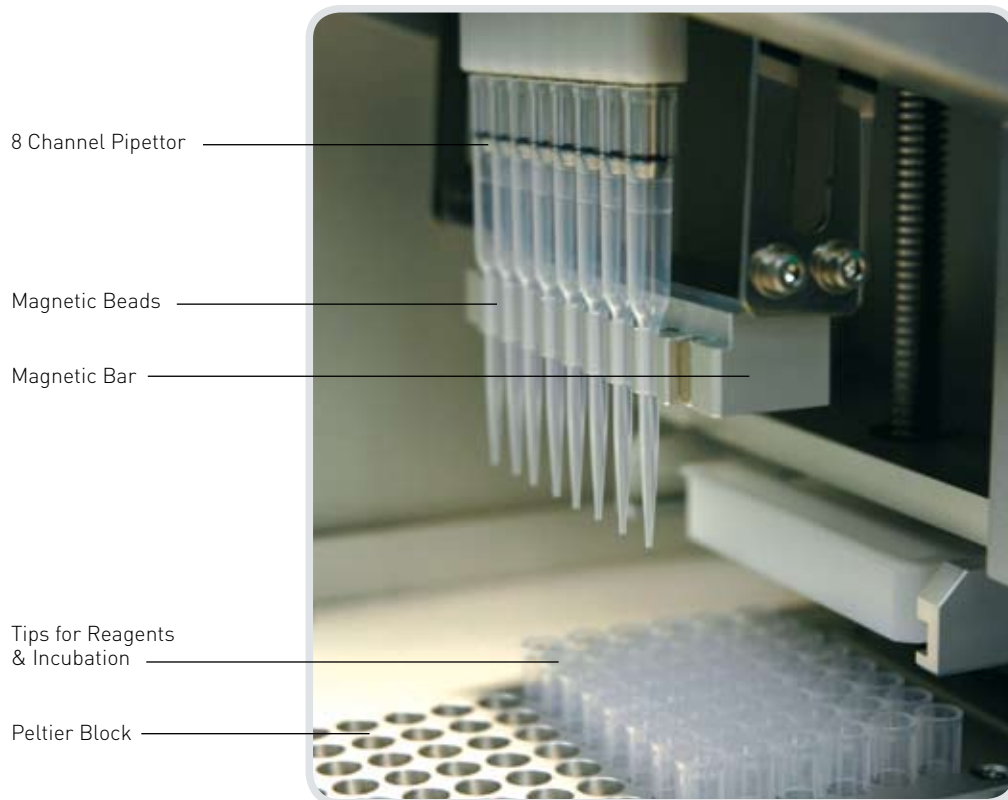
"Our results are much less influenced by random variation if the immunoprecipitation is performed with the SX-8G IP-Star System. For most genes, similar methylation profiles are obtained but [are] much less 'noisy'. In some cases these differences might lead to the detection of additional differentially methylated genes."

Jörg Tost, Centre National de Génotypage, IP-Star customer

SX-8G IP-Star™ Automated System—streamline your epigenetics workflow for unmatched reproducibility

Overview of the SX-8G IP-Star Automated System

The SX-8G IP-Star Automated System for epigenetics immunoprecipitation assays is the lab workhorse that empowers epigenetics researchers to attain increased data reproducibility, productivity, convenience, and full automation. Multiple stations on the IP-Star deck provide flexibility in throughput and experimental design.



The SX-8G IP Star uses reagents stored in 12 microfuge tubes on the instrument deck to automate and streamline the series of steps required for magnetic ChIP and methylation assays.

Applications on IP-Star

The SX-8G IP-Star Automated System has been validated across diverse methods for optimized chromatin immunoprecipitation and DNA methylation studies. Our ChIP and DNA methylation kits provide the versatility, convenience, and reproducibility that you require for all your epigenetics research. For ChIP assays on the SX-8G IP-Star, we offer the Auto ChIP Kit for unparalleled reproducibility starting with as few as 1,000 cells. For DNA methylation assays with the SX-8G IP-Star, we offer optimized kits for both methylated DNA immunoprecipitation (MeDIP) and Methylation Binding Domain Protein Affinity Separation (MBD). Additional innovative kits are in development at Diagenode.

Chromatin Immunoprecipitation (ChIP):

The Diagenode Auto ChIP kit includes optimized buffers, antibodies, and reagents for automated immunoprecipitation of chromatin using the SX-8G IP-Star robot, enabling scientific researchers to have:

- Speed:** The entire procedure with the SX-8G IP-Star automation can be performed in less than 10 hours, as two overnight incubations have been eliminated.
- Data consistency:** Full walk-away SX-8G IP-Star automation with our validated reagents and antibodies will drastically increase the consistency of your ChIP assay.
- Sample efficiency:** Smaller reaction tubes and fewer buffers in our innovative system enables low starting amounts without the need for amplification.
- Workflow compatibility and convenience:** Our Auto ChIP kit has been optimized to specifically select and precipitate the chromatin with our antibodies, buffers and protocols. We have also optimized chromatin shearing with the Bioruptor® and downstream purification with our specialized DNA isolation buffer (DIB) in preparation for qPCR, high-throughput sequencing, or microarrays.

Substantially lower %CVs are obtained with the SX-8G IP-Star vs. manual ChIP

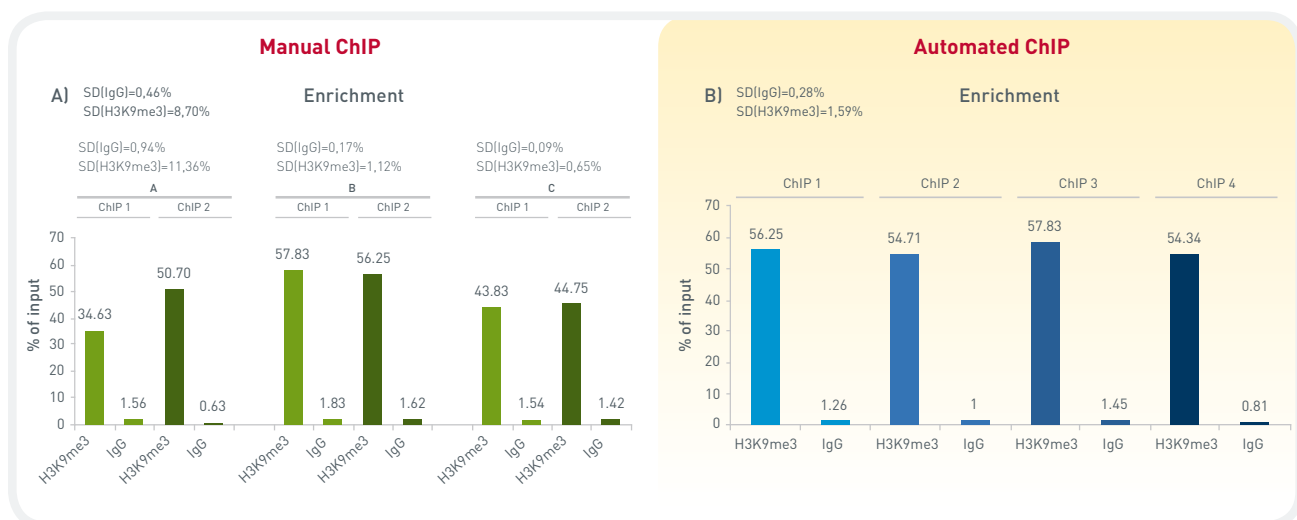


Figure 4. The standard deviations of chromatin immunoprecipitations is greatly reduced with automated ChIP using the SX-8G IP-Star and Auto ChIP kit (panel B) compared to the highly varied standard deviations of ChIP performed manually (panel A). Briefly, different operators have performed these ChIP experiments using the H3K9me3 antibody on the SAT2 genomic region (positive locus). Reagents, sheared chromatin, and starting amounts (10,000 HeLa cells/IP) were identical per assay.



The IP-Star Automated System—provides unmatched data accuracy for DNA methylation studies

DNA Methylation with Automated MeDIP and MBD Assays

Diagenode DNA Methylation kits include optimized buffers, antibodies, and reagents for automated immunoprecipitation of methylated DNA using the SX-8G IP-Star system. Diagenode provides flexibility for your specific research needs and offers both a methylated DNA immunoprecipitation kit (MeDIP) as well as a methyl binding domain protein (MBD) affinity separation kit for highly reproducible DNA methylation enrichment.

Methylated DNA Immunoprecipitation (MeDIP)

The Auto MeDIP kit, when combined with SX-8G IP-Star automation enables:

- **Reproducibility:** Full walk-away SX-8G IP-Star automation with our validated reagents and antibodies will dramatically increase the consistency of your MeDIP assay.
- **High quality data:** Kit contains 5-methyl cytidine antibody and both methylated DNA (meDNA) and unmethylated DNA (unDNA) internal controls to measure immunoprecipitation efficiency and allow direct comparison of immunoprecipitated DNA and methylation status.
- **Speed:** The entire procedure with the SX-8G IP-Star automation can be performed in less than 9 hours.
- **Simplicity:** Single-tube system allows smaller reaction volumes and fewer buffers
- **Workflow compatibility and convenience:** Our Auto MeDIP kit has been optimized to specifically precipitate methylated DNA with our antibodies, buffers and protocols. We have also optimized DNA shearing with the Bioruptor® and downstream purification with our specialized DNA isolation buffer (DIB) in preparation for qPCR, high-throughput sequencing, or microarrays.

Methyl Binding Domain protein (MBD) affinity separation

Diagenode's MethylCap kit has been optimized for the enrichment of methylated DNA using a specifically engineered MBD (Methyl binding domain) protein, and in combination with SX-8G IP-Star allows:

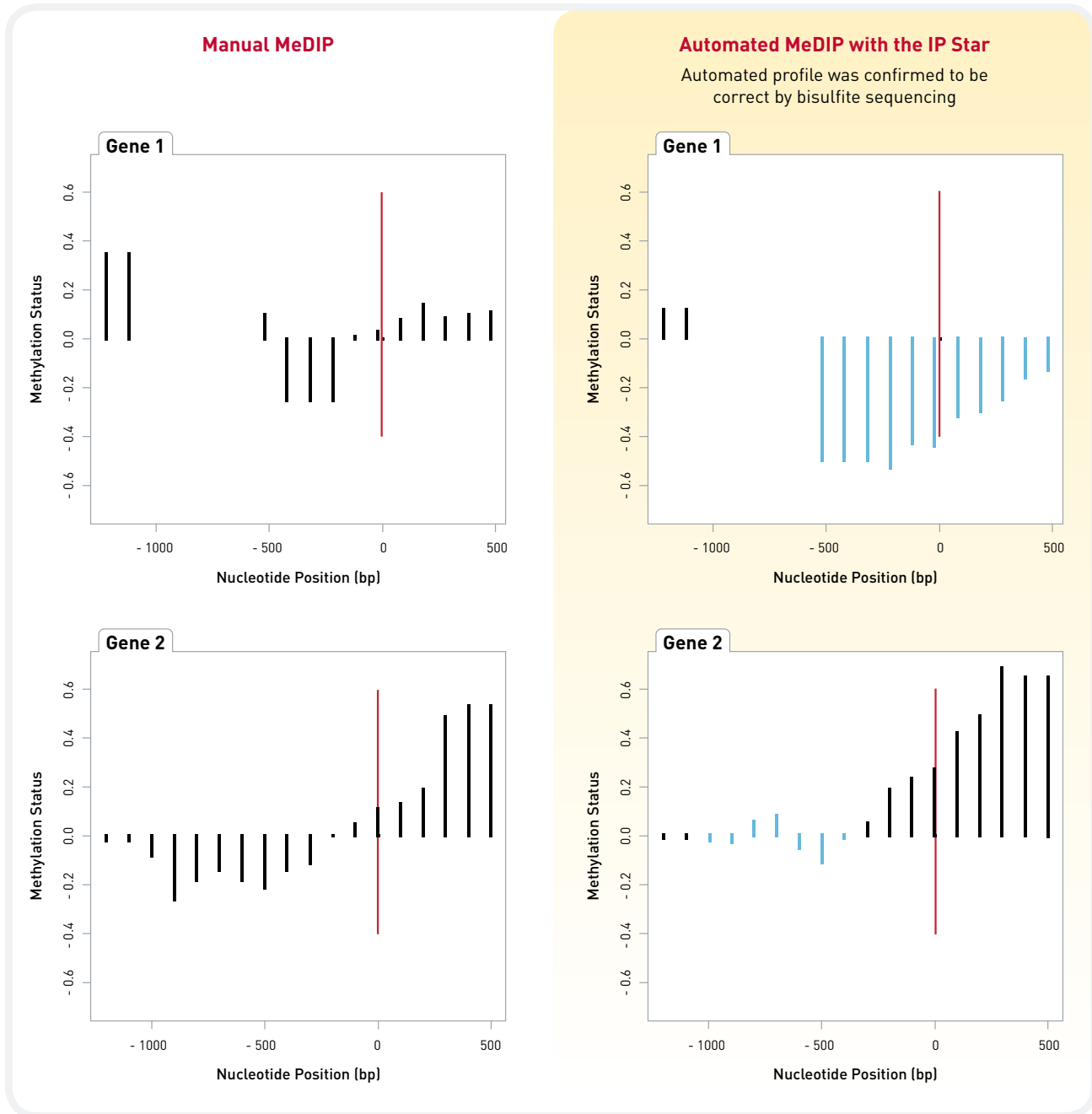
- **Reproducibility and speed:** Full walk-away SX-8G IP-Star automation with our validated reagents will drastically increase the consistency of your DNA methylation assay.
- **High quality data:** GST-MBD fusion protein has been extensively validated and allows for fractionation of methylated DNA by CpG density. The kit also includes controls primer pairs to assess capture efficiency.
- **Workflow compatibility and convenience:** Our kit has been optimized to specifically enrich methylated DNA with our reagents and protocols. We have also optimized chromatin shearing with the Bioruptor® and downstream purification with our specialized DNA isolation buffer (DIB) in preparation for qPCR, high-throughput sequencing, or microarrays.

DNA purification solutions

Diagenode has developed two purification systems for processing of DNA after ChIP, MBD protein or MeDIP assays which are included with the Diagenode Auto ChIP, MeDIP and MethylCap kits:

- **DNA Isolation Buffer (DIB):** The DIB technique is quick, efficient DNA isolation technique used when qPCR is the subsequent workflow step. The DIB components are completely compatible with reverse crosslinking of a chromatin-DNA complex and yield high quality DNA.
- **IPure:** Using a magnetic-bead based technique, IPure Purification yields high quality DNA and has a high yield (~80%) across a wide range of input DNA amounts.

Automated MeDIP experiments yield new insights to MeDIP-on-chip results



Data provided by Jörg Tost, Centre National de Génotypage, Evry, France

Figure 2. Methylation patterns have been analyzed using MeDIP-on-chip in mouse wildtype and mutant cell lines. The left two panels show the differential methylation patterns of two genes (gene 1 and gene 2) using a manual MeDIP protocol. The right two panels show the differential methylation patterns of the same genes using the Auto MeDIP kit and the SX-8G IP-Star Automated System. The red line corresponds to the transcription start site of the gene. The Y axis corresponds to the differential methylation level of an oligonucleotide probe of a wildtype versus a mutant mouse cell line. Positive values correspond to hypermethylation in the mutant cell line, negative values to hypomethylation in the mutant cell line. X axis represents the nucleotide position. The microarrays used are NimbleGen 385K Mouse promoter and CpG island arrays. All findings have been validated by quantitative pyrosequencing of bisulfite-treated DNA.

Ordering information

Description	Reference	Packing
SX-8G IP-Star Automated System for ChIP, MeDIP, and MBD	UH-001-0001	1 pc
Auto ChIP kit x16	AB-Auto01-0016	16 rxns
Auto ChIP kit x100	AB-Auto01-0100	100 rxns
Auto MeDIP kit x16	AF-Auto01-0016	16 rxns
Auto MeDIP kit x100	AF-Auto01-0100	100 rxns
Auto MethylCap x48	AF-Auto01-0048	48 rxns
200 µl tube strips (8 tubes/strip) + cap strips	WA-001-0150	150 pc
200 µl tube strips (12 tubes/strip) + cap strips	WA-001-0100	100 pc
Tips (bulk)	WC-001-1000	100 pc

Visit us at one of Diagenode's demo sites or discover the SX-8G IP-Star by performing some automated assays with the help of our R&D and Technical Department.

www.diagenode.com

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