



Nanodigmbio

Total Solution of Methylation Capture Sequencing Based on BS Conversion

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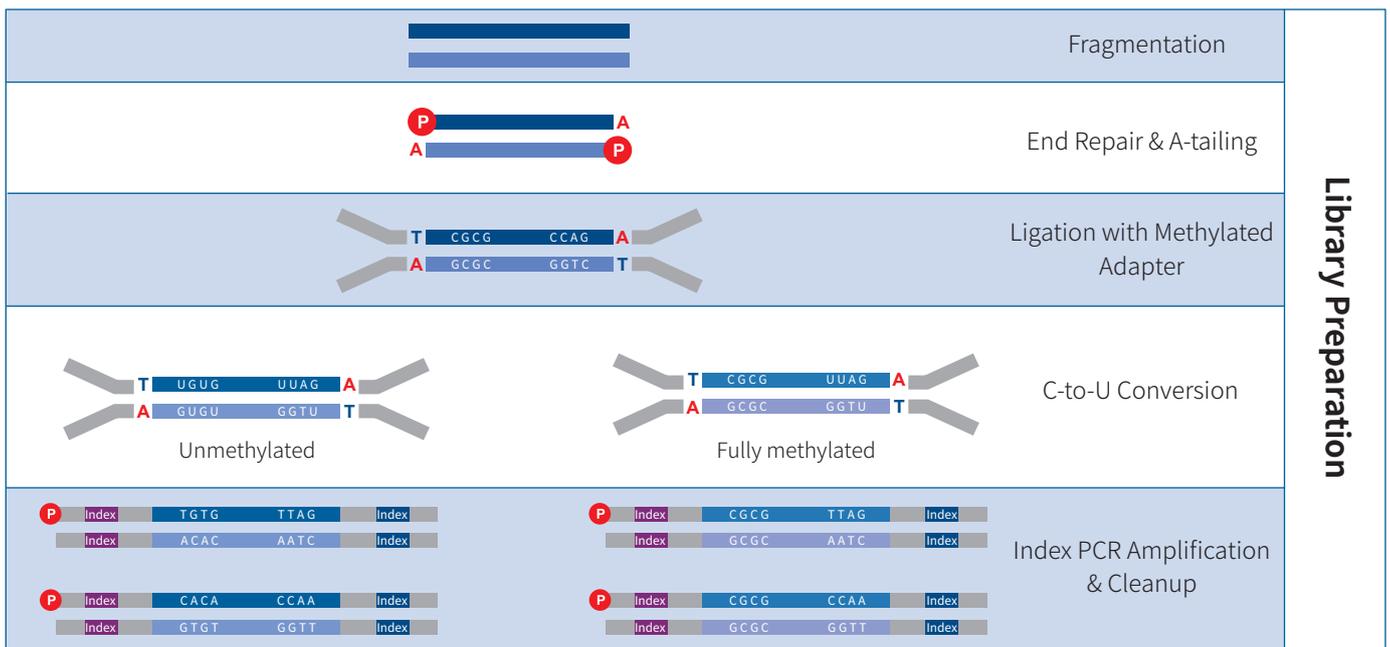
Total Solution of Methylation Capture Sequencing Based on BS Conversion

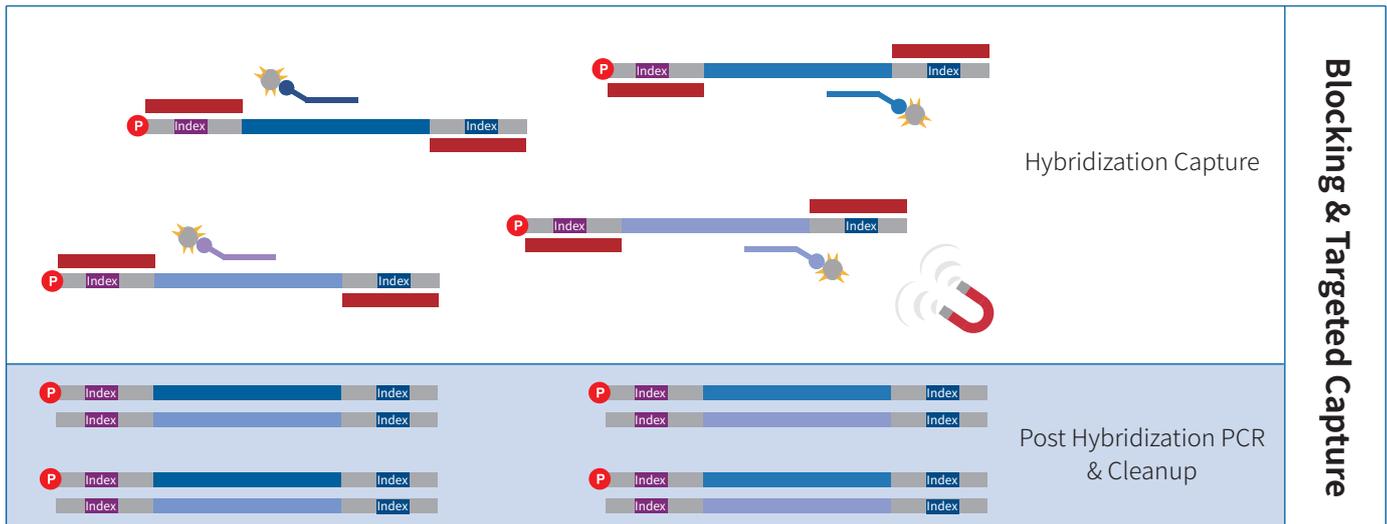
Background

DNA methylation, an epigenetic modification, is closely related to the gene expression and chromatin remodeling. Abnormal methylation status correlates to the occurrence and development of various diseases such as cancer. The precise identification of cytosine methylation status in genome plays a critical role in research and clinical areas, especially in precision oncology.

In terms of analyzing methylation status, with the treatment of bisulfite or enzymes, the unmethylated cytosine can be converted to uracil, whereas the methylated cytosine remains unchanged. Afterwards, combined with high-throughput sequencing technology, the genomic methylation status can be analyzed massively with single nucleotide resolution. However, there are still cost and efficiency limitations for the analysis of whole genomes, the introduction of targeted enrichment technology can reduce the sequencing cost and improve the targeted analysis efficiency by improving the sequencing depth of regions of interest. Nanodigmbio offers an NGS total solution for capture-based methylation sequencing (Methyl-Seq) on both MGI sequencing platforms and Illumina sequencing platforms, including Methyl-Seq library preparation kit based on bisulfite or enzymatic conversion, methylation bisulfite conversion module, design & synthesis service of capture probes, hybridization reagents, and integrated analysis tools. Designed to help researchers to quickly and accurately analyze the methylation status of the genome, providing support for research and clinical diagnosis of related diseases.

Workflow





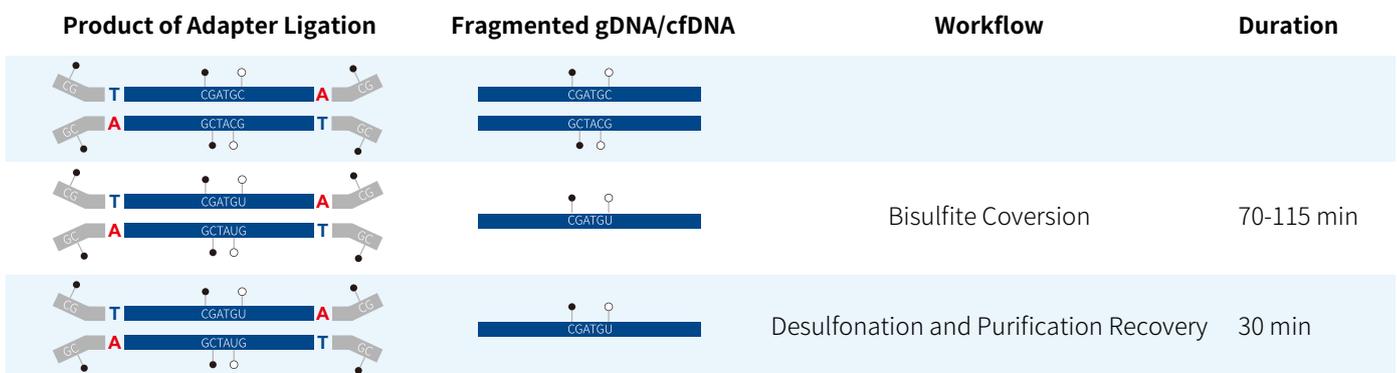
*The above schematic diagram is taking NadPrep Methyl Stubby Adapter (UDI) (with 10 nt Index) as an example.

Introduction

NadPrep Methyl Library Preparation Module is a double-strand DNA methylation sequencing library preparation kit developed for MGI & Illumina sequencing platforms. It supports multiple options for adapters selection, including: **NadPrep Methyl Adapter (SI) Module (for MGI)**, **NadPrep Methyl Adapter (MDI) Module (for MGI)** and **NadPrep Methyl Stubby Adapter (UDI) Module (with 10 nt Index)**, etc. This kit can be used to prepare whole-genome methylation sequencing library. When combined with Nanodigmbio's liquid-phase hybridization capture series products, it enables targeted enrichment of methylation sequencing library.

NadPrep DNA Methyl Bisulfite Conversion Module is a methylation conversion reagent developed for DNA samples based on the principle of bisulfite conversion. The conversion module, based on a magnetic bead purification protocol, efficiently converts unmethylated cytosine to uracil within 2 hr, leaving methylated cytosine unchanged, and it can be compatible with automated workstations. It can be seamlessly integrated with Nanodigmbio's NadPrep double-strand methylation library preparation scheme and NadPrep single-strand methylation library preparation scheme, allowing flexible selection among various types of starting samples.

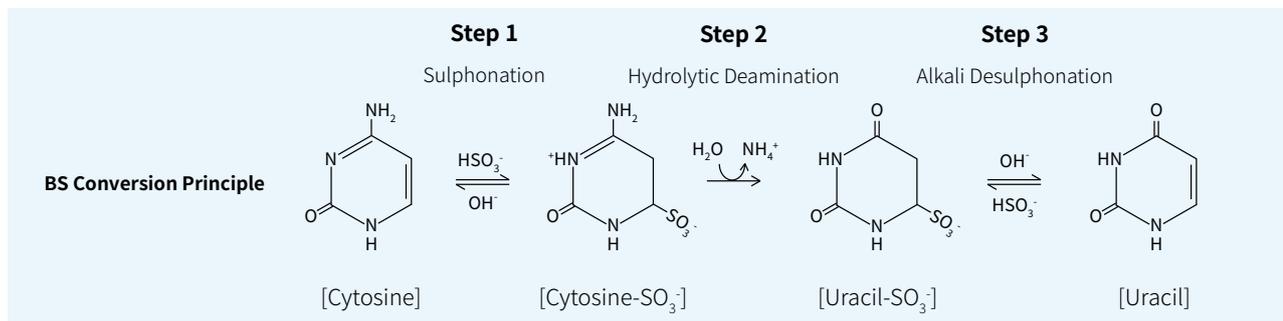
Bisulfite conversion workflow



● Methylated C
○ Unmethylated C

● Methylated C
○ Unmethylated C

The above schematic diagram of adapter-ligated product is taking NadPrep Methyl Stubby Adapter (UDI) as an example.



Feature

- Compatible with multiple types of samples and supports a wide range of input amounts
- Different types of adapter modules can be selected for matching according to the sequencing platform
- Efficient and stable cytosine conversion rate
- Excellent detection sensitivity of 5mC and 5hmC
- Convenient operation is conducive to automation implementation

Performance

Library yield and conversion efficiency

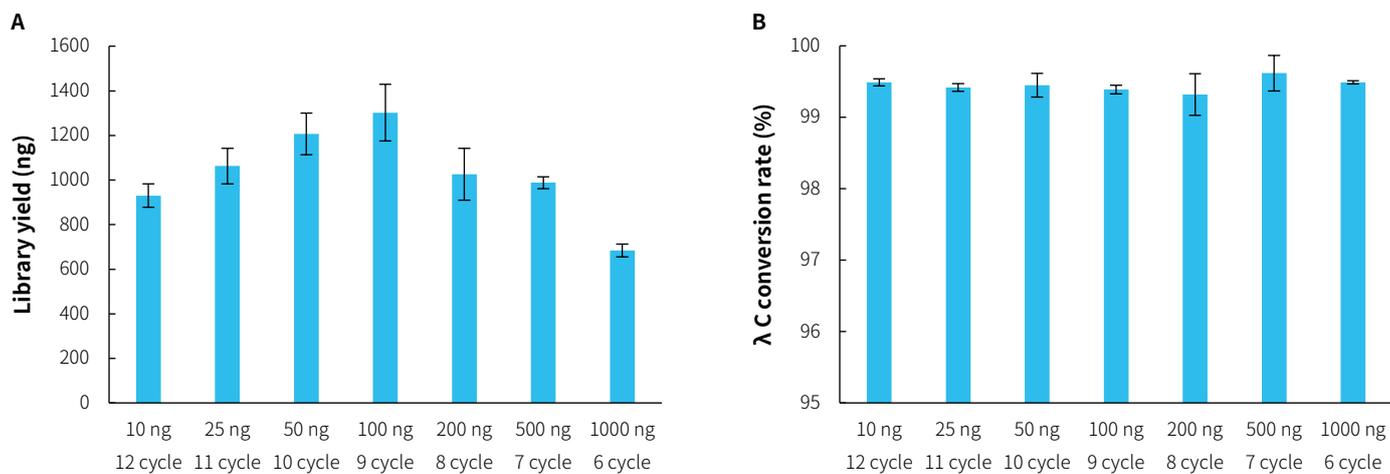


Fig 1. Library yield and conversion efficiency of samples with different input amounts. Human Genomic DNA standards (Promega, G1471) were used with NadPrep Methyl Library Preparation Module in combination with NadPrep Methyl Stubby Adapter (UDI) Module (with 10 nt Index) and NadPrep DNA Methyl Bisulfite Conversion Module for library preparation, Sequencing were performed on Illumina Novaseq 6000, PE150. **A.** Library yield; **B.** λ DNA C conversion rate.

Capture performance

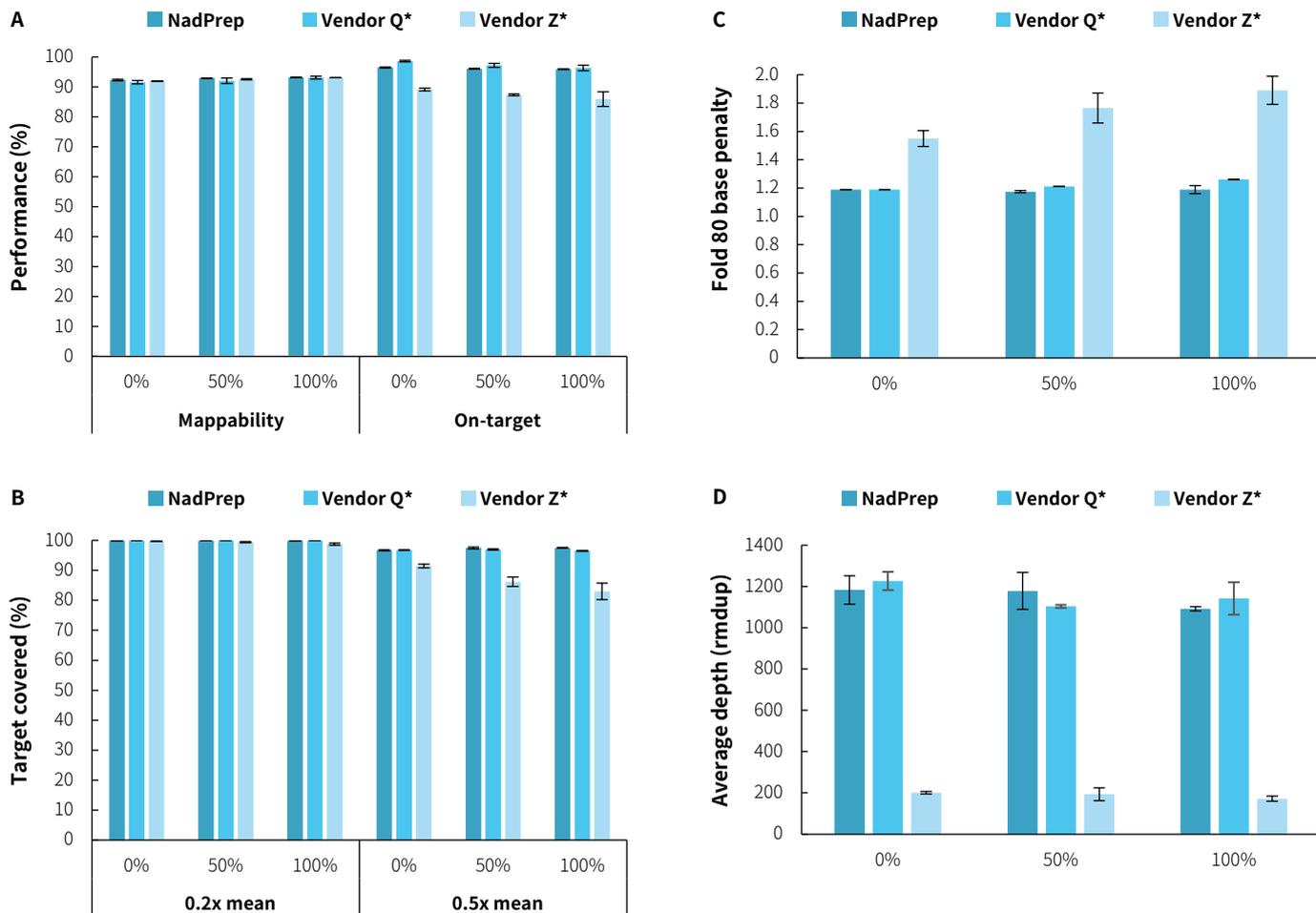


Fig 2. Capture performance of samples with different methylation levels. 50 ng simulated samples with different methylation levels were prepared using NadPrep Methyl Library Preparation Module in combination with NadPrep Methyl Stubby Adapter (UDI) Module (with 10 nt Index) after bisulfite conversion. The pre-libraries were capture with a methylation demo panel (60 Kb). Sequencing was performed on Illumina Novaseq 6000, PE150, On-target rate was calculated by the number of reads. **A.** Mappability and On-target rate; **B.** Target covered; **C.** Fold 80 base penalty **D.** Average sequencing depth after deduplication.

Note: The samples consisted of 100% Methylated DNA (zymo, D5014-2) as a positive control and 0% Methylated DNA (zymo, D5014-1) as a negative control, mixed at different ratios to simulate different methylation levels (0%, 50%, and 100%). Vendor Q* and Vendor Z* refer to different bisulfite conversion modules provided by Vendor Q* and Vendor Z*, respectively.

Methylation detection

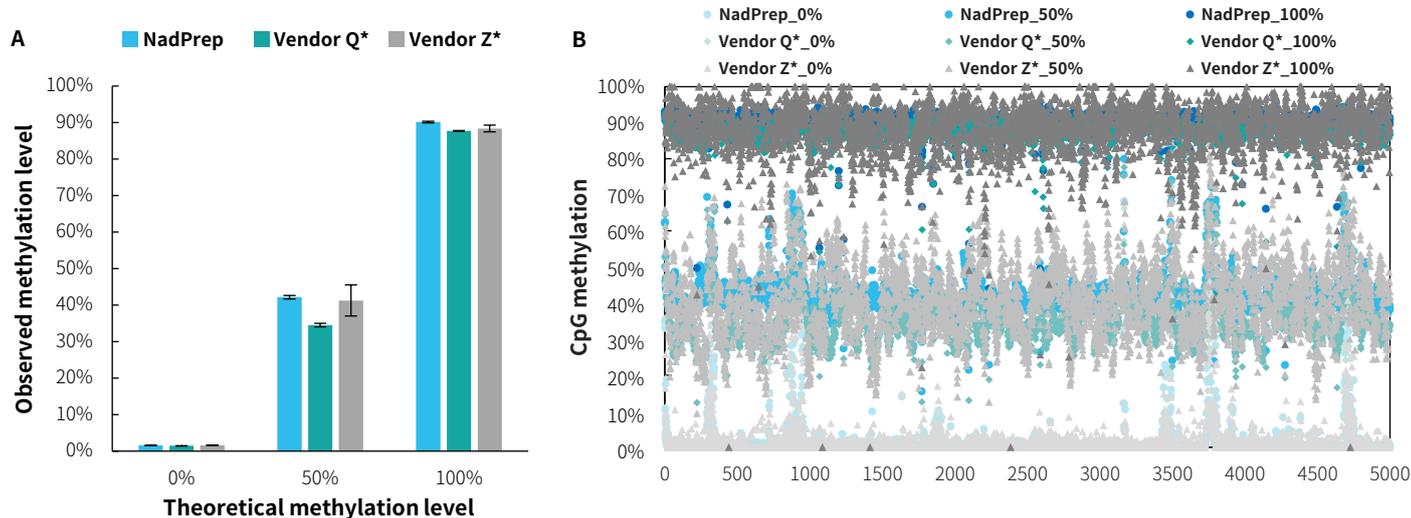


Fig 3. Targeted sequencing performance of samples with different methylation levels. A. Comparison between theoretical methylation levels and detected methylation levels; **B.** CpG methylation levels in target regions.

Ordering Information

Type	Product	Detail	Catalog#
Lib Prep Module	NadPrep Methyl Library Preparation Module, 24 rxn	24 rxn	1002501
	NadPrep Methyl Library Preparation Module, 96 rxn	96 rxn	1002502
Methyl Adapter (SI) Module	NadPrep Methyl Adapter (SI) Module Set A1 (for MGI), 24 rxn	#1-12	1003631
	NadPrep Methyl Adapter (SI) Module Set B1 (for MGI), 96 rxn	#1-24	1003632
Methyl Adapter (MDI) Module	NadPrep Methyl Adapter (MDI) Module Set A1 (for MGI), 24 rxn	#1-12	1003740
	NadPrep Methyl Adapter (MDI) Module Set B1 (for MGI), 96 rxn	#1-24	1003741
Methyl Stubby Adapter (UDI) Module	NadPrep Methyl Stubby Adapter (UDI) Module Set A1 (with 10 nt Index), 24 rxn	#1-12	1003371
	NadPrep Methyl Stubby Adapter (UDI) Module Set B1 (with 10 nt Index), 96 rxn	#1-24	1003381
BS Conversion Module	NadPrep DNA Methyl Bisulfite Conversion Module, 24 rxn	24 rxn	1002701
	NadPrep DNA Methyl Bisulfite Conversion Module, 96 rxn	96 rxn	1002702

Statement

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