Data Sheet

Agilent
Trusted Answers

Magnis SureSelect XT HS2 DNA Reagent Kit

Automation of the Agilent SureSelect XT HS2 library preparation workflow on the Agilent Magnis NGS Prep system.

Key Attributes

- **Productivity**: eliminate multiple hands-on pipetting steps with automation that only requires approximately 15 minutes of preparation
- **Flexibility**: start with either unsheared or fragmented nucleic acids to accommodate many applications and sample types
- **Throughput**: increase downstream sequencing pooling capacity with 192 dual sample indexes that maximize throughput and reduce sequencing costs
- **Performance**: improve the accuracy of variant calling with dual molecular barcodes and increase data quality with dual sample indexes that minimize "index-hopping"

Figure 1. The Magnis NGS Prep system and the Magnis SureSelect XT HS2 DNA kit. Together, these products provide an advanced system for walk-away automation of NGS target enrichment and library preparation.

Introduction

The Agilent Magnis SureSelect XT HS2 DNA reagent kit is built on the proven SureSelect XT HS2 DNA chemistry, which is an advanced next-generation sequencing (NGS) library preparation and target enrichment solution. The kit provides a flexible and streamlined workflow, excellent performance, and comprehensive features that support many applications. This kit is compatible with many sample types, including formalin-fixed, paraffin-embedded (FFPE) tissues, and produces libraries compatible with Illumina sequencing platforms. The automated reagent kit delivers libraries with high performance in all key sequencing metrics that are comparable to the manual kit.

Users can now benefit from the high-performance library preparation chemistry of the Magnis SureSelect XT HS2 reagent kit used in concert with the excellent automation of the Magnis NGS Prep system. The Magnis system is a benchtop automation platform dedicated to target enrichment and NGS library preparation. It enables full walk-away automation with only 10-15 minutes of hands-on time, compared with the 2.5 hours needed in a manual workflow. This reduces the potential for operator error and allows technicians to focus on other tasks.

Benefits of the Magnis SureSelect NGS Library Prep Platform

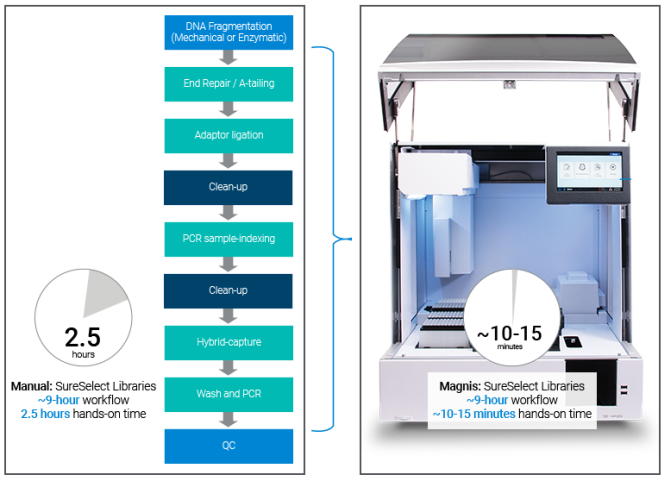

Figure 2. Walk-away automation minimizes hands-on time. Technicians can free-up their time to work on important tasks and reduce the incidence of manual preparation errors by running their NGS library preparation on the Magnis system. The system provides automation with more unique sample indexes for higher-throughput sequencing.

Dual sample indexes support high-throughput applications

For laboratories that routinely analyze samples by NGS, pooling multiple libraries in the same sequencing run increases throughput and reduces per-sample costs. The Magnis SureSelect XT HS2 reagent kit improves pooling capability with 192 unique dual sample indexes, a significant increase over the 32 sample indexes in the previous generation of SureSelect XT HS kits. Now up to 192 libraries can be pooled in the same flow cell on low-, medium-, and high-throughput Illumina sequencing platforms.

Moreover, many genomics laboratories rely on high-throughput sequencers to keep up with demand for NGS data. Sample misassignment, or "index-hopping," has been occasionally observed with Illumina high-throughput sequencing platforms and can reduce data quality. The Magnis SureSelect XT HS2 kit helps ensure high data quality because the dual sample indexes minimize index hopping.

Dual molecular barcodes for improved variant calling

To reduce the incidence of false positive results and improve the accuracy of variant calling, the Magnis SureSelect XT HS2 kit incorporates dual molecular barcodes (MBCs). MBCs have been shown to help detect variants down to 1% variant allele frequency.[1] This feature is critical to reliably detect low-allele-frequency variants in certain applications and sample types.

Streamlined workflow with onboard shearing

DNA fragmentation is an essential early step in NGS library preparation that is typically performed with time-consuming, hands-on steps at the bench. The Magnis SureSelect XT HS2 protocol simplifies this process by including enzymatic fragmentation. The operator starts from 14 µL of extracted genomic DNA (gDNA) and can adjust fragmentation time to optimize fragment size for their downstream read length and sample type.

The protocol is flexible so users can select either an established gDNA shearing protocol (such as mechanical fragmentation) or the onboard enzymatic shearing process. The operator can start with 50 µL of pre-sheared gDNA and proceed directly to library preparation by choosing this option on the Magnis system touch screen.

Excellent performance

The performance of the Magnis SureSelect XT HS2 DNA reagent kit is illustrated with the Agilent Magnis SureSelect Human Exome V8 panel. The SureSelect Human Exome V8 panel offers an up-to-date and comprehensive 41.6 Mb design that spans not only protein coding regions, but also the *TERT* promoter and hard-to-capture exons. The key sequencing metrics of libraries produced by the Magnis SureSelect XT HS2 DNA reagent kit and protocol starting from 10 and 200 ng gDNA, respectively, are illustrated in Figure 3.

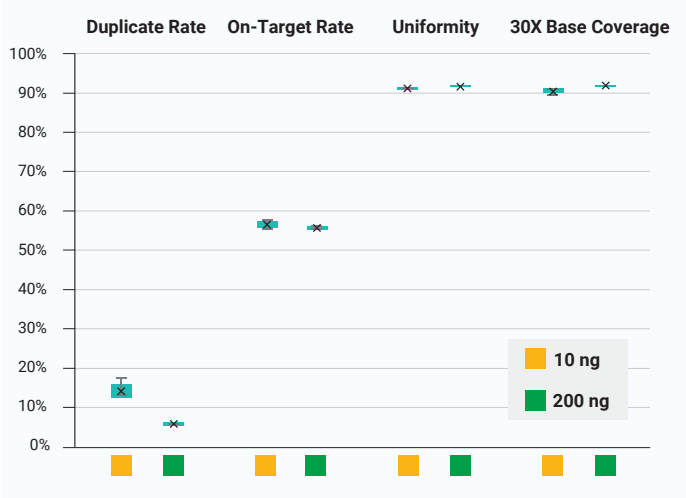

Figure 3. Performance of the Magnis SureSelect XT HS2 Human All Exon V8 kit comparable from 10-200 ng of DNA. Sequencing libraries were prepared with 10 and 200 ng of mechanically sheared NA12878 gDNA. For each input amount, two Magnis runs were performed with four replicates in each run. All libraries were sequenced on an Illumina HiSeq 4000 instrument using 2 x 100 bp reads and downsampled to 50 million reads. Sequencing uniformity and coverage of 30X are above 90% for both inputs while the on-target rates are highly similar. It is expected that the duplicate rate observed in the 10 ng sample is noticeably higher than the 200 ng sample given the significant difference between the input amounts.

These data demonstrate that the Magnis SureSelect XT HS2 DNA reagent kit supports DNA input from as low as 10 ng up to 200 ng from blood-derived gDNA inputs. This kit also works with FFPE samples (data not shown).

Data generated from 200 ng of input DNA using the Magnis SureSelect XT HS2 Exome V8 kit was compared with data generated from a manual NGS workflow and Magnis SureSelect XT HS workflow. The sequencing uniformity, represented by Fold-80 base penalty and > 30X sequencing coverage, are shown in Figure 4, further demonstrating the high performance of the Magnis SureSelect XT HS2 DNA kit and protocol.

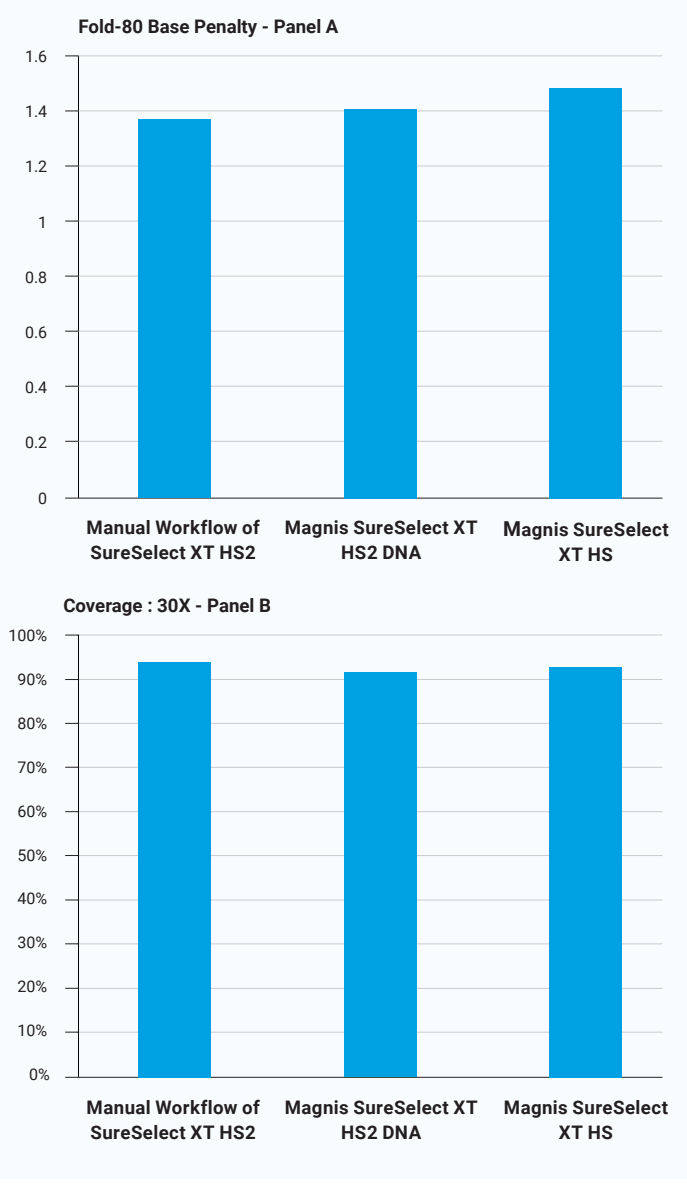

Figure 4. Comparable performance of the SureSelect Human Exome V8 kit between a manual and automated Magnis SureSelect XT HS2 DNA workflow. All libraries were prepared with 200 ng of mechanically sheared NA12878 gDNA and were sequenced on an Illumina HiSeq 4000 instrument by 2 x 100 bp reads and downsampled to 50 million reads. Samples were assessed for Fold-80 Base Penalty (panel A) and percentage of reads that met, or exceeded, 30X coverage (panel B).

Within the Magnis SureSelect XT HS2 workflow, the operator can choose between using automated enzymatic gDNA fragmentation or using gDNA that has already been fragmented. The key sequencing metrics illustrate that the assay's performance is comparable whether the operator uses integrated enzymatic fragmentation or DNA that has already been mechanically sheared (Figure 5).

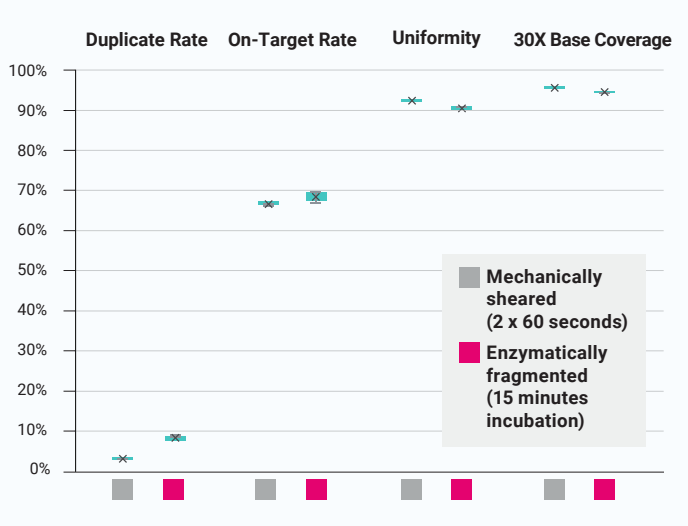

Figure 5. Enzymatic and mechanical shearing options provide comparable performance. Key sequencing metrics of Magnis SureSelect XT HS2 Exome V8 using 200 ng of NA12878 gDNA by two Magnis runs with four replicates in each run. Libraries were constructed either from mechanically sheared DNA or enzymatically fragmented DNA. All libraries were sequenced on an Illumina HiSeq 4000 instrument by 2 x 150 bp reads and downsampled to 40 million reads.

In conclusion, the Magnis SureSelect XT HS2 DNA reagent kit provides the advantages of the SureSelect XT HS2 chemistry in a walkaway automation format for labs with low-, medium-, and high-throughput Illumina sequencing platforms. Moreover, the option of on-deck enzymatic fragmentation further streamlines the workflow.

Ordering Information

Part Number	Product Name and Description
32 Reaction Kits	
G9751A	Magnis SureSelect XT HS2 DNA, Tier 1 (1 - 499kb), Illumina, 32
G9752A	Magnis SureSelect XT HS2 DNA, Tier 2 (0.5-2.9Mb), Illumina, 32
G9753A	Magnis SureSelect XT HS2 DNA, Tier 3 (3-5.9Mb), Illumina, 32
G9754A	Magnis SureSelect XT HS2 DNA, Tier 4 (6-11.9Mb), Illumina, 32
G9755A	Magnis SureSelect XT HS2 DNA, Tier 5 (12-24Mb), Illumina, 32
G9756A	Magnis SureSelect XT HS2 DNA, 24-50Mb, Illumina, 32
G9773A	Magnis SureSelect XT HS2 DNA, Exome V7, Illumina, 32
G9774A	Magnis SureSelect XT HS2 DNA, Exome V8, Illumina, 32
G9778A	Magnis SureSelect XT HS2 Human All Exon V8+NCV, 32
G9779A	Magnis SureSelect XT HS2 Human All Exon V8+UTR, 32
96 Reaction Kits	
G9751B	Magnis SureSelect XT HS2 DNA, Tier 1 (1 - 499kb), Illumina, 96
G9752B	Magnis SureSelect XT HS2 DNA, Tier 2 (0.5-2.9Mb), Illumina, 96
G9753B	Magnis SureSelect XT HS2 DNA, Tier 3 (3-5.9Mb), Illumina, 96
G9754B	Magnis SureSelect XT HS2 DNA, Tier 4 (6 11.9Mb), Illumina, 96
G9755B	Magnis SureSelect XT HS2 DNA, Tier 5 (12-24Mb), Illumina, 96
G9756B	Magnis SureSelect XT HS2 DNA, 24-50Mb, Illumina, 96
G9773B	Magnis SureSelect XT HS2 DNA, Exome V7, Illumina, 96
G9774B	Magnis SureSelect XT HS2 DNA, Exome V8, Illumina, 96
G9778B	Magnis SureSelect XT HS2 Human All Exon V8+NCV, 96
G9779B	Magnis SureSelect XT HS2 Human All Exon V8+UTR, 96

Reference

1. Agilent Technologies. SureSelect XT HS Target Enrichment; 2018. Brochure, 5991-8165EN.

www.agilent.com

Published in the USA, May 17, 2022
5994-4951EN

Agilent
Trusted Answers