Next-Generation Sequencing (NGS)

Library preparation solutions

Next-Generation Sequencing (NGS) has revolutionized genomic research with its throughput, scalability and speed. The applications of NGS in clinical diagnostics are rapidity expanding, particularly in the fields of oncology, microbiology or clinical genetics.

In order to be used successfully as a diagnostic tool, data generated by NGS must be reliable and accurate. One of the factors that significantly impacts the quality of NGS data is the quality and quantity of the library loaded on the sequencer flow cell. A poor-quality library can skew results with uneven coverage or poor yield, affecting the accuracy and reliability of the sequencing. Meridian offers a range of NGS library preparation solutions compatible with automated workflows and achieving optimal sequencing output.

Library clean-up & size selection

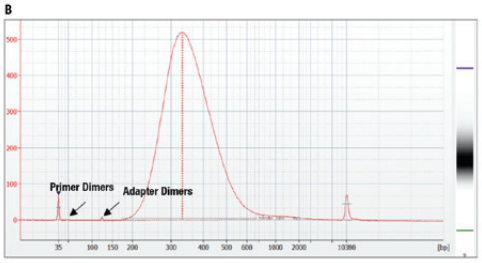
Paramagnetic SPRI beads designed for clean-up and size selection of DNA fragments or NGS libraries. Paramagnetic beads selectively bind DNA fragments based on the volume ratio of bead suspension and sample. They are capable of delivering highly purified DNA fragments, efficiently removing contaminants, such as nucleotides, primers, adapters, enzymes, buffer additives and salts.

PRODUCT	CAT NO.	REACTIONS
NGS Clean and Select Beads	MDX041	50 mL
		500 mL

Product Highlights

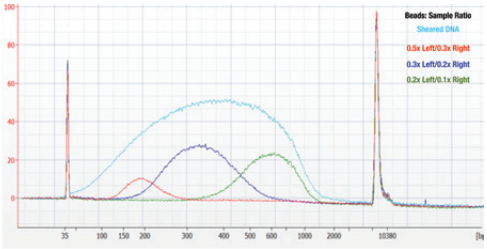
- Highly-reproducible results
- Tunable size selection protocols for single or double sided selection
- Compatible with manual and automated workflows

Efficient removal of primers and adapters



Electropherogram showing the library size profile after removal of unincorporated adapters and PCR primers (arrows) after using NGS Clean and Selection Beads.

Size distribution after double-sided size selection



For double-sided size selection, supernatant from a right-side selection step *(which excludes the largest library fragments)* is re-purified using a different ratio of beads, according to the left-sided size selection protocol to exclude the smallest library fragments.

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Library Quantification

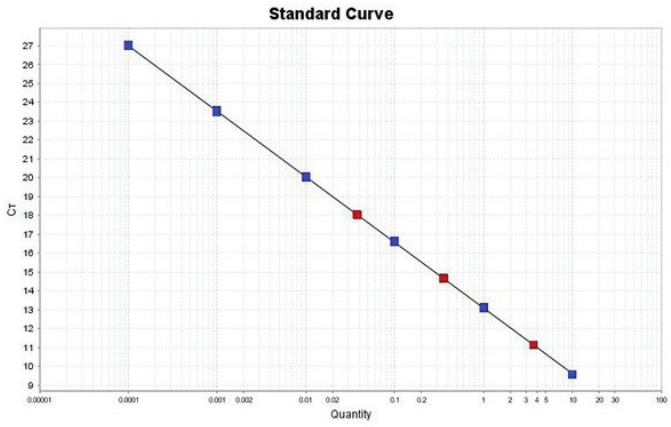
qPCR-based assay for the exclusive quantification of adapter-ligated molecules providing accurate quantification of Illumina NGS libraries. Contains pre-diluted standards to minimize pipetting errors, a P5 / P7 Illumina® specific primer mix and an optimized buffer for dilution of NGS library samples.

PRODUCT	CAT NO.	REACTIONS
Library Quantification Kit	MDX039	500 Rxn / Kit

Product Highlights

- Suitable for quantification of all Illumina compatible libraries
- Accurate results in less than 90 minutes
- Contains a series of six pre-diluted DNA standards for rapid and reliable standard curve generation, providing precise and accurate quantification
- 18 sets of standards can be used for 62 libraries on six 96-well plates or 76 libraries on two 384-well plates

qPCR-based Quantification of NGS Libraries



Standard curve generated from the amplifications of the 6 pre-diluted DNA standards (blue, 10 pM to 100 aM) and 3 dilutions of an Illumina® NGS library (red, ten-fold series).

Enzymes for PCR-amplified and PCR-free Libraries

Enzymes and buffers necessary for end repair, A-tailing, ligation and PCR amplification. Reactions can be performed in the same tube as reaction buffers have been optimized to work together to provide maximum reaction efficiency and conversion rates, while eliminating clean-up steps and minimizing sample loss. High-Fidelity Pfu and its buffer have been developed to ensure even coverage of the results with minimal error rate incorporation.

PRODUCT	CAT NO.	VOLUME	REACTIONS
NGS Enzymes			
NGS ER Enzyme Mix A mix that processes both 3' and 5' overhangs generating products that are 5' phosphorylated with 3' A-overhang	MDX040	6 mL	1,000 Rxn
NGS Ligase Enzyme that catalyzes the ligation of adapters to end-repaired DNA fragments	MDX037	2 mL	1,000 Rxn
High-Fidelity Pfu DNA polymerase with 3'-5' proofreading exonuclease activity, with an error rate of 3.0 x 10^{-6} generating blunt-ended amplicons up to 5 kb in length	MDX003	200 µL	500 Units
		10 mL	25,000 Units
Buffers			
NGS End-Repair Buffer, 5x Optimized for use with NGS ER Enzyme Mix (Cat# MDX040)	MDX035	10 mL	1,000 Rxn
NGS Ligase Buffer, 5x Optimized for use with NGS Ligase (Cat# MDX037)	MDX036	3 mL	1,000 Rxn
NGS High-Fidelity Pfu Buffer, 10x Optimized for use with High-Fidelity Pfu (Cat# MDX003)	MDX038	2 mL	1,000 Rxn

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