IDT library preparation and hybridization capture automated on MGI SP-960

Hybridization captured libraries are compatible with MGI DNBSEQ-G400 and DNBSEQ -T7 sequencers

Fully automated library preparation and hybridization capture

Consistent results with 8- and 12-plex hybridization capture

IDT products are compatible with MGI automation and sequencing platforms

Pair together IDT's quality library preparation and hybrid capture with MGI automation and sequencing platforms to achieve a highly automated workflow
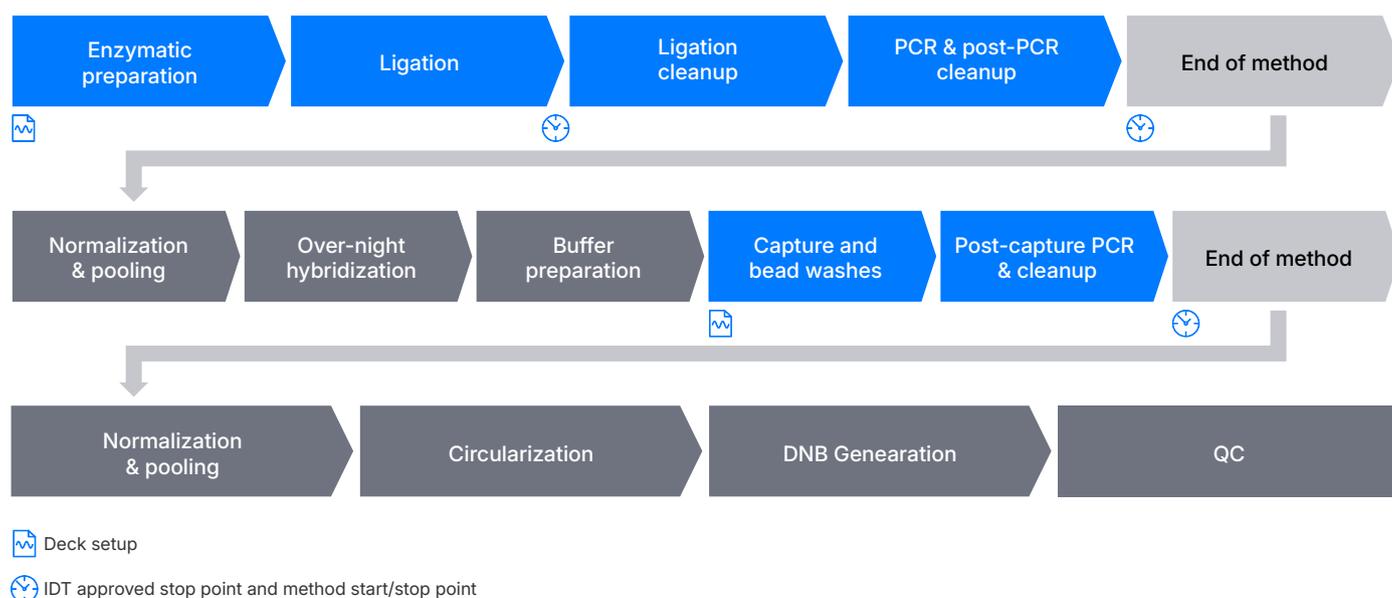
Increase workflow throughput by automating the IDT xGen™ DNA EZ library prep kit and hybrid capture with MGI's automation and sequencing platforms. The fully automated workflow reduces hands-on time and results in high-quality targeted libraries that can be easily converted to be compatible with MGI's DNBSEQ™ sequencing platforms. **The DNBSEQ sequencing technology combines the advantages of low amplification error rates from DNA nanoballs, and high density patterned arrays. These advantages dramatically improve sequencing accuracy and have much lower duplication rates in sequencing applications.**

The xGen DNA Library Prep EZ Kit followed by xGen NGS Hybridization Capture automated on the MGISP-960 High-throughput Automated Sample Preparation System (MGISP-960) and sequenced on the MGI DNBSEQ-G400 and DNBSEQ-T7 sequences provides:

1. An end-to-end solution for NGS library preparation followed by enrichment on the MGISP-960 platform

2. High-quality sequencing results through DNBSEQ technology on MGI sequencing platforms

3. Increase throughput with hybrid multiplexing capabilities and compatibility with 1536 Unique Dual Index (UDI) primers

4. Knowledgeable support from IDT for your automation needs

Figure 1. MGI SP-960 High-throughput Automated Sample Preparation System.

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[Enzymatic preparation] → [Ligation] → [Ligation cleanup] → [PCR & post-PCR cleanup] → [End of method]

[Normalization & pooling] → [Over-night hybridization] → [Buffer preparation] → [Capture and bead washes] → [Post-capture PCR & cleanup] → [End of method]

[Normalization & pooling] → [Circularization] → [DNB Geneation] → [QC]
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Deck setup

IDT approved stop point and method start/stop point

Figure 2. IDT xGen DNA EZ Library Prep followed by IDT xGen NGS Hybridization Capture automated workflow. Blue indicates automated steps on the MGISP-960; dark gray are manual interventions; and light gray indicates where an automation method ends.

Automated IDT xGen DNA Library Prep EZ kit and hybridization capture using xGen Exome Hyb Panel v2 resulted in consistent, quality sequencing metrics on multiple MGI sequencers

Researchers can increase throughput by automating the library preparation and hybridization capture from IDT on the MGISP-960. The hybrid captured library results generated on the MGISP-960 and sequenced on two different MGI sequencing platforms generates consistent, high-quality results. All libraries, regardless of plex levels or sequencing instrument, have >90% selected bases (on-target metric) (**Figure 3A**), <3.5% duplication rates (**Figure 3B**), and a low fold-80 base penalty (**Figure 3C**), zero coverage targets <1.4% (**Figure 3D**), and <1 GC dropouts (**Figure 3E**). All metrics are similar across libraries and between plex levels highlighting the consistency of the preparation and automation of the hybrid captured libraries. The quality and consistency of the metrics above results in fewer lost reads during sequencing which translates to a mean target coverage of ≥60x for each library with only 50 million reads per sample (**Figure 3F**). Overall, the IDT library preparation and hybrid capture protocols performed on the SP960 automation platform and sequenced on MGI instrument result in quality, consistent data.
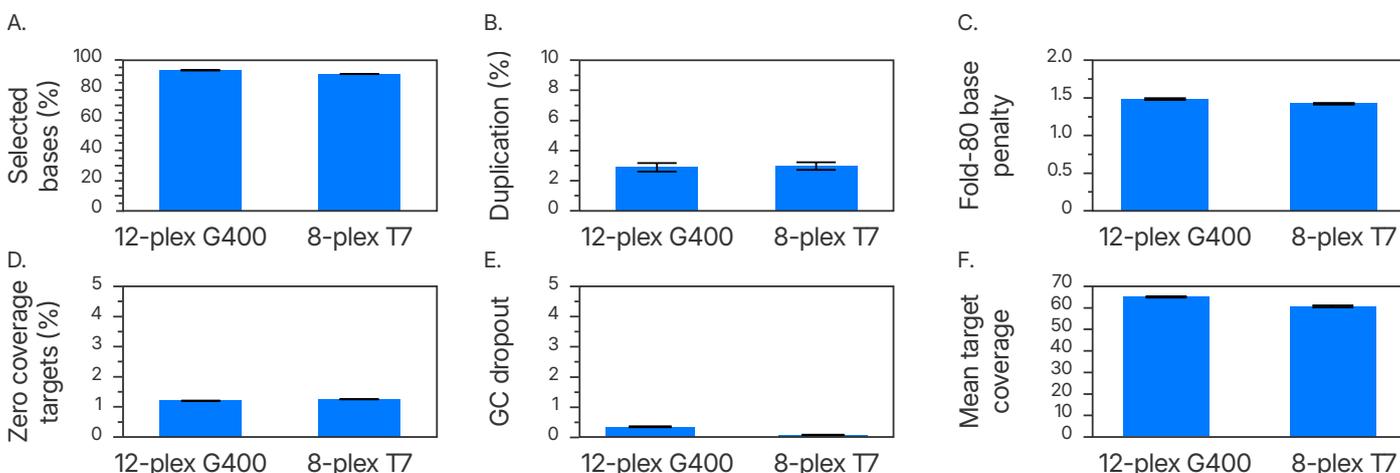
Figure 3. Quality and consistent results across all libraries. Libraries were generated on the MGISP-960 using 100 ng input or 423 ng of DNA from a Coriell sample using the xGen DNA Library Prep EZ with xGen UDI Primers. Libraries were hybridization captured on the MGISP-960 using the xGen Exome Hyb Panel v2 and xGen Hybridization Capture Core Reagents as an 8-plex using the libraries generated from 100 ng inputs $n = 1$ or 12-plex using libraries generated from the 423 ng input $n = 1$. Captured libraries were made compatible with the MGI sequencing platforms using the MGIEasy™ Universal Library Conversion Kit. The 8-plex libraries were sequenced on the MGI DNBSEQ-G400 system and the 12-plex libraries were sequenced on the DNBSEQ-T7 system. All libraires were subsampled to 50 million reads/sample. Data was analyzed using picard and hg38 as the reference genome.

Ordering information

Product	Catalog #	URL
xGen™ DNA Lib Prep EZ	10009863 or 10009821	https://www.idtdna.com/pages/products/next-generation-sequencing/workflow/xgen-ngs-library-preparation/dna-library-preparation/dna-library-prep-kit
xGen™ UDI Primers Plate 1, 8nt	10005922	https://www.idtdna.com/pages/products/next-generation-sequencing/workflow/xgen-ngs-library-preparation/dna-library-preparation/dna-library-prep-kit
xGen Hybridization and Wash v2 Kit	10010352, 10010354	https://www.idtdna.com/pages/products/next-generation-sequencing/workflow/xgen-ngs-hybridization-capture/hybridization-capture-core-reagents
xGen™ Universal Blockers TS	1075474 or 1075475 or 1075476	https://www.idtdna.com/pages/products/next-generation-sequencing/workflow/xgen-ngs-hybridization-capture/hybridization-capture-core-reagents
xGen™ Library Amplification Primer Mix	1077675 or 1077676 or 1077677	https://www.idtdna.com/pages/products/next-generation-sequencing/workflow/xgen-ngs-hybridization-capture/hybridization-capture-core-reagents
xGen™ Exome Hyb Panel v2	10005152 or 10005153	https://www.idtdna.com/pages/products/next-generation-sequencing/workflow/xgen-ngs-hybridization-capture/pre-designed-hyb-cap-panels/exome-hyb-panel-v2
MGIEasy Universal Library Conversion Kit (App-A)	1000004155	https://en.mgitech.cn/Download/download_file/id/85
DNBSEQ-T7 High throughput Sequencing Set**	940-000268-00	https://en.mgi-tech.com/products/reagents_info/25/
HotMPS High-throughput Sequencing Set (G400 HM FCL PE100)***	940-000489-00	https://en.mgi-tech.com/products/reagents_info/53/
Configuration 2 -MGISP-960 (CE, RUO)	900-000147-00	https://en.mgi-tech.com/products/instruments_info/4/
Genetic Sequencer DNBSEQ-G400-RS*	900-000493-00	https://en.mgi-tech.com/products/instruments_info/2/
High-Throughput Sequencing Primer Kit (App-D)	1000028550	https://en.mgi-tech.com/Download/download_file/id/207
Genetic sequencer DNBSEQ-T7*	T7RS-900-000242-00	https://en.mgi-tech.com/Download/download_file/id/24

*This sequencer is only available in selected countries, and its software has been specially configured to be used in conjunction with MGI's HotMPS sequencing reagents exclusively.

**This sequencing reagent is only available in selected countries.

***Unless otherwise informed, StandardMPS and CoolMPS sequencing reagents, and sequencers for use with such reagents are not available in France, Germany, Spain, UK, Sweden, Italy, Czech Republic, Switzerland and Hong Kong (CoolMPS is available in Hong Kong).

For more information, visit idtdna.com/NGSautomation