

GeneRead™ Library Prep and Size Selection Kits

For the preparation, size selection and purification of DNA libraries for NGS applications

GeneRead Library Prep Kits and the GeneRead Size Selection Kit provide an optimized and efficient workflow for library preparation in next-generation sequencing (NGS) applications. GeneRead Library Prep Kits allow fast and efficient preparation of DNA libraries that are for use on NGS platforms from Illumina® and the Ion Torrent® instrument from Life Technologies®, while the GeneRead Size Selection Kit enables precise size selection and purification of DNA fragments using a fast and convenient spin-column-based procedure.

GeneRead Library Prep Kits provide:

- A fast, one-tube procedure that allows up to 50% time saving
- High yields from minimal amounts of starting material
- Unbiased amplification with an optional, high-fidelity amplification step
- Support for multiplexing up to 96 samples on sequencer

The GeneRead Size Selection Kit provides:

- Precise size selection of DNA fragments
- Fast procedure, based on QIAGEN's proven silica-column technology
- An easy-to-follow protocol, automatable on the QIAcube®

Fast, one-tube protocol saves time and delivers reproducibly high yields of library DNA

GeneRead Library Prep Kits provide an efficient and optimized workflow to reproducibly generate high yields of DNA library, with minimal sequence bias and low error rates, for use on NGS platforms from Illumina or the Ion Torrent instrument from Life Technologies. Highly efficient ligation reactions and an optional, high-fidelity amplification step ensure superior library yields and quality, even from as low as 50 ng starting material (Figure 1), while the fast, one-tube procedure saves time and effort and minimizes the variability caused by handling, along with the risk of contamination (Figures 2 and 4).

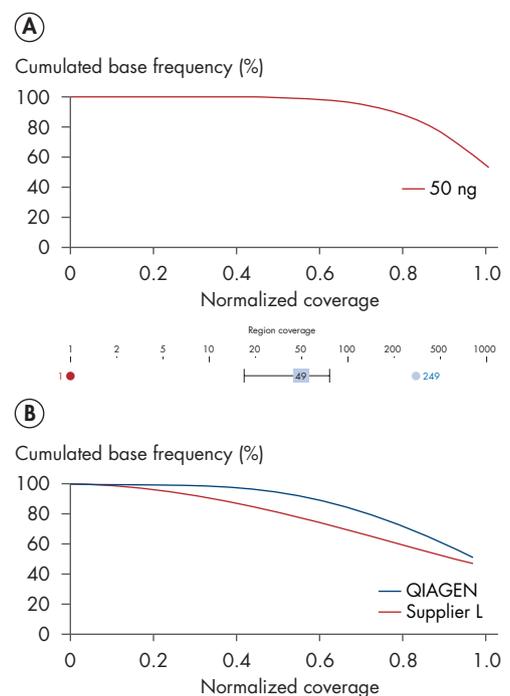


Figure 1. High yields of library DNA with uniform coverage distribution. **A** Genomic DNA (50 ng) was sheared using a Covaris® instrument and made into an Illumina-compatible DNA library using the GeneRead Library Prep (I) Kit. Sequencing using an Illumina MiSeq® instrument revealed a median coverage of 49-fold with uniform coverage distribution. **B** Genomic DNA (1 µg) from *E. coli* strain DH10B was sheared and used to generate an Ion Torrent-compatible DNA library using the GeneRead Library Prep (I) Kit or a kit from another supplier. After amplification for 10 cycles, both libraries were sequenced on an Ion Torrent PGM instrument and the cumulated normalized coverage was analyzed.

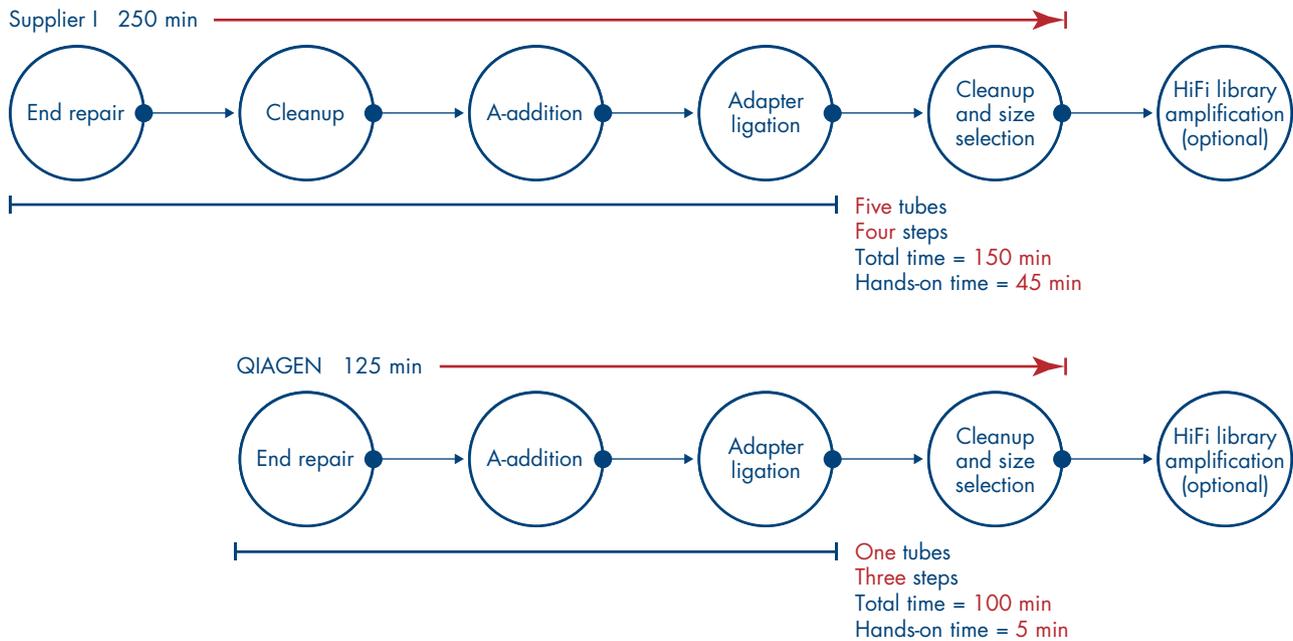


Figure 2. Optimized workflow allows more rapid and efficient preparation of Illumina-compatible DNA libraries. The GeneRead Library Prep (I) Kit uses an optimized one-tube protocol, with fewer cleanup steps and optional high-fidelity library amplification. The hands-on time and total time required for preparation of library DNA is significantly reduced compared to the library preparation system from Supplier I.

Low error rates, with minimal sequence bias

To ensure maximum yields from minimum amounts of starting material, GeneRead Library Prep Kits include an innovative high fidelity master mix for an optional amplification step that uses GeneRead HiFi Polymerase, a unique, highly specific and processive enzyme that delivers accurate amplification of library DNA with low error rates and minimum bias (Figure 3).

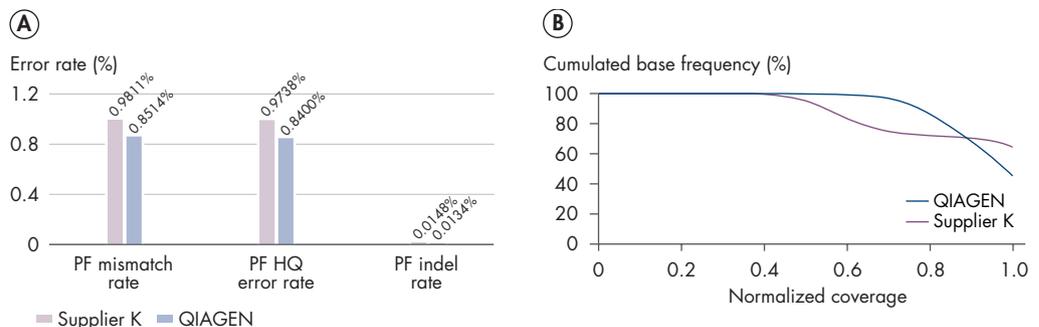


Figure 3. Low error rates with minimal sequence bias due to high-fidelity amplification. A mixture of highly GC-rich *Bordetella pertussis* gDNA (GC content 67.7%) and highly AT-rich *Streptobacillus moniliformis* gDNA (GC content 26.3%) was pooled, made into an Illumina-compatible DNA library using the GeneRead Library (I) Core Kit, and amplified with the GeneRead Library (I) Amp Kit, which contains GeneRead HiFi Polymerase, or a kit from Supplier K. The amplified libraries were sequenced using the Illumina MiSeq instrument, and fidelity and sequence coverage were analyzed using the Galaxy platform. **A** Low error rates and **B** greater cumulated sequence coverage demonstrate that the GeneRead Library (I) Amp Kit provides superior library amplification compared to the kit from Supplier K.

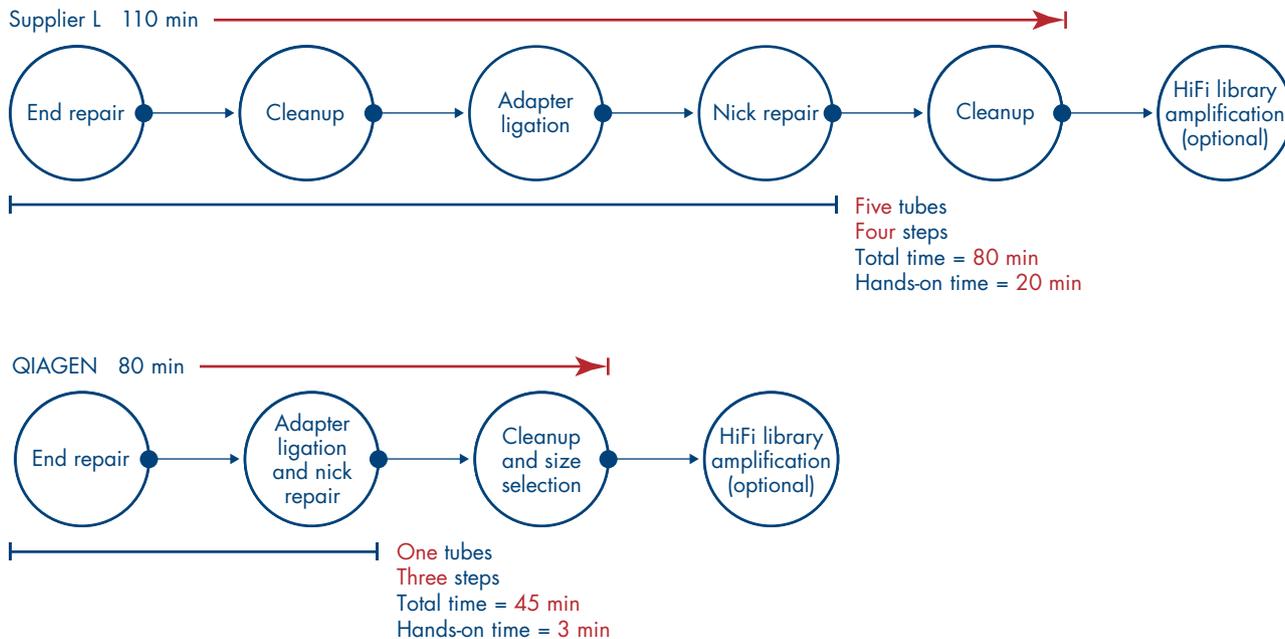


Figure 4. Optimized workflow allows more rapid and efficient preparation of Life Technologies-compatible DNA libraries. The GeneRead Library Prep (L) Kit uses an optimized, one-tube procedure, with fewer cleanup steps and optional high-fidelity library amplification. The hands-on time and total time required for preparation of library DNA is significantly reduced compared to the library preparation system from Supplier L.

Lower sequence bias when amplifying GC- and AT-rich regions

In standard PCR amplification procedures, regions of DNA with high AT or GC content can result in little or no amplification, leading to misleading sequence data and NGS results. The GeneRead HiFi Polymerase, together with its unique buffer formulation, ensures uniform amplification of genomic regions that contain highly variable GC content, thereby ensuring even coverage in subsequent sequencing reactions (Figure 5).

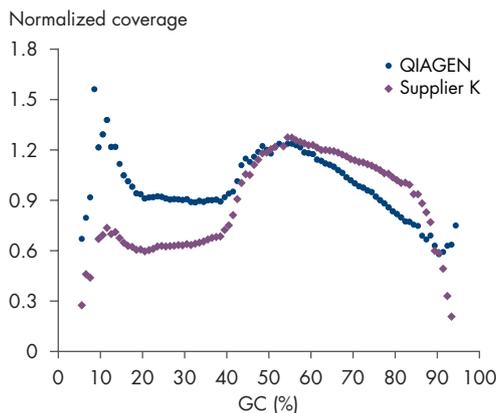


Figure 5. Better sequence coverage and minimal bias when amplifying GC- or AT-rich sequences. A mixture of highly GC-rich *Bordetella pertussis* gDNA (GC content 67.7%) and highly AT-rich *Streptobacillus moniliformis* gDNA (GC content 26.3%) was pooled, made into an Illumina-compatible DNA library using the GeneRead Library Prep (L) Kit, and amplified with the GeneRead Library Amp (L) Kit, which contains GeneRead HiFi Polymerase, or a kit from Supplier K. The amplified libraries were sequenced using the Illumina MiSeq instrument, and fidelity and sequence coverage was analyzed using the Galaxy platform. The GeneRead Library Prep Kit provided greater sequence coverage in GC- and AT-rich areas of DNA, compared to the kit from Supplier K.

Ordering Information

Product	Contents	Cat. no.
GeneRead DNA Library I Kit (96)	Buffers and reagents for end repair, A-addition, ligation and library amplification; for use with Illumina instruments; includes a plate containing 96 adapters with different barcodes (pierceable foil seal allowing usage of defined parts of plate)	180435
GeneRead DNA Library I Core Kit (12)	For 12 reactions: Buffers and reagents for end repair, A-addition and ligation, for use with Illumina instruments	180432
GeneRead DNA I Amp Kit (100)	For 100 reactions: Buffers and reagents for library amplification, for use with Illumina instruments	180455
GeneRead Adapter I Set 1-plex (12)	For 12 reactions: Adapters for DNA ligation, for use with Illumina instruments	180912
GeneRead Adapter I Set A 12-plex (144)	For 144 reactions: 12-barcoded adapters for ligation to DNA library, for use with Illumina instruments	180985
GeneRead Adapter I Set B 12-plex (144)	For 144 reactions: 12-barcoded adapters for DNA ligation, for use with Illumina instruments	180986
GeneRead DNA Library L Core Kit (12)	For 12 reactions: Buffers and reagents for end repair, ligation and nick repair, for use with Life Technologies instruments	180462
GeneRead DNA L Amp Kit (100)	For 100 reactions: Buffers and reagents for library amplification, for use with Life Technologies instruments	180485
GeneRead Adapter L Set 1-plex (12)	For 12 reactions: Adapters for DNA ligation, for use with Life Technologies instruments	180922
GeneRead Adapter L Set 12-plex (72)	For 72 reactions: 12 barcoded adapters for ligation to DNA library, for use with instruments from Life Technologies	180994
GeneRead Size Selection Kit (50)	For 50 reactions: Spin columns and buffers	180514

For up-to-date licensing information and product-specific disclaimers, see the respective QIAGEN kit handbook or user manual. QIAGEN kit handbooks and user manuals are available at www.qiagen.com or can be requested from QIAGEN Technical Services or your local distributor.

Visit www.qiagen.com/goto/NGS for more information!

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