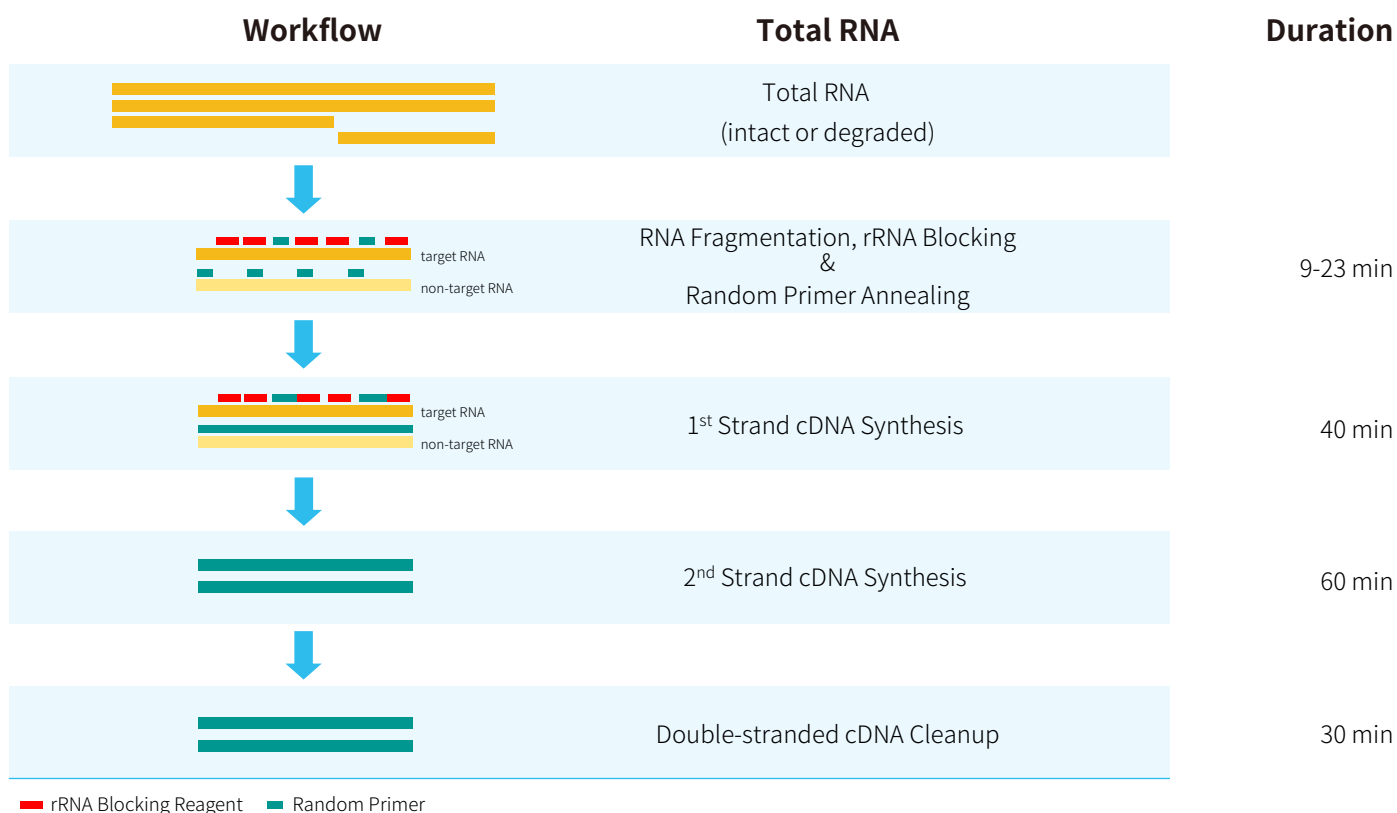


LeXPrep rRNA Fast Blocking Comprehensive Solution

Background

RNA sequencing (RNA-Seq) has become an indispensable and effective tool in basic biological research and disease diagnosis. It can not only detect differences in gene expression under different conditions but also reveal the diversity in RNA structure, such as alternative splicing, gene fusions, and single nucleotide mutations. In the total RNA of normal cells/tissues, ribosomal RNA (rRNA) typically accounts for over 80% of the content. The abundance of rRNA occupies a significant portion of sequencing capacity and resources, thus reducing the efficiency of detecting target transcriptome information. Therefore, the removal of rRNA impact is one of the crucial steps in RNA-Seq, contributing to improved accuracy, efficiency, and cost-effectiveness of research. This is particularly important for the detection of low-abundance transcripts, ensuring that sequencing resources are focused on the RNA molecules of interest. Traditional solutions involve enriching mRNA with Oligo dT magnetic beads or using bead-based and enzymatic methods to remove rRNA. These methods have some limitations, especially in terms of complex procedures, often requiring a significant amount of time. Therefore, LexigenBio has designed and developed the **rRNA Fast Blocking Comprehensive Solution**, aiming to achieve cost-effective and straightforward rRNA blocking. This solution requires only a single-step operation to rapidly and efficiently block rRNA, saving substantial time and effort.

Workflow



Introduction

LeXPrep rRNA Fast Blocking Comprehensive Solution, using **LeXPrep rRNA Blocking Reagent** coupled with **LeXPrep Total RNA-To-DNA Module**, seamlessly connects to LeXPrep DNA Library Preparation Kit-series. This solution enables the rapid blocking of rRNA in total RNA, facilitating the detection of biological information in RNA samples, including gene expression, single nucleotide variations, alternative splicing, gene fusions, and more.

LeXPrep rRNA Blocking Reagent is a specialized processing module developed for high-throughput sequencing platforms to rapidly block rRNA in total RNA. This kit-series offer both commercial and customized solutions, supporting species-specific designs. It is suitable for total RNA with initial input amounts ranging from 50-500 ng, sourced from cells, tissues, and FFPE samples. If you require a customized design for a specific species, please contact us at for professional, personal advice.

- **LeXPrep rRNA Blocking Reagent (Human)** is specifically designed for the rapid blocking of rRNA in human total RNA. The reagents in this kit are quality-controlled and functionally validated to ensure reliable and stable blocking of human rRNA.
- **LeXPrep rRNA Blocking Reagent (Zebrafish)** is specifically designed for the rapid blocking of rRNA in zebrafish total RNA. The reagents in this kit are quality-controlled and functionally validated to ensure reliable and stable blocking of zebrafish rRNA.

LeXPrep Total RNA-To-DNA Module is a total RNA reverse transcription module developed for high-throughput sequencing platform. This module can reverse transcribe total RNA from human sources (cells, tissues, or FFPE samples) with an initial template amount ranging from 10-200 ng into fragmented double-stranded DNA. The products of this module can be directly ligated with the LeXPrep DNA Library Preparation Kit-series, eliminating the need for additional fragmentation steps.

Feature

Simple and Convenient

- Mix the rRNA Blocking Reagent directly with the reaction system in a single pipetting step

Fast and Efficient

- Efficiently block rRNA in just 8 min
- Effectively enrich low-abundance RNA
- Enhance informative content and reduce sequencing costs

Flexible Compatibility

- Compatible with samples of different RNA quality
- Support the input ranging from 50 to 500 ng of RNA sample
- Compatible with third-party RNA library preparation kits
- Flexible customization for extension to other species or regions

Performance

Compatible with Different Input Amounts for Various Sample Types

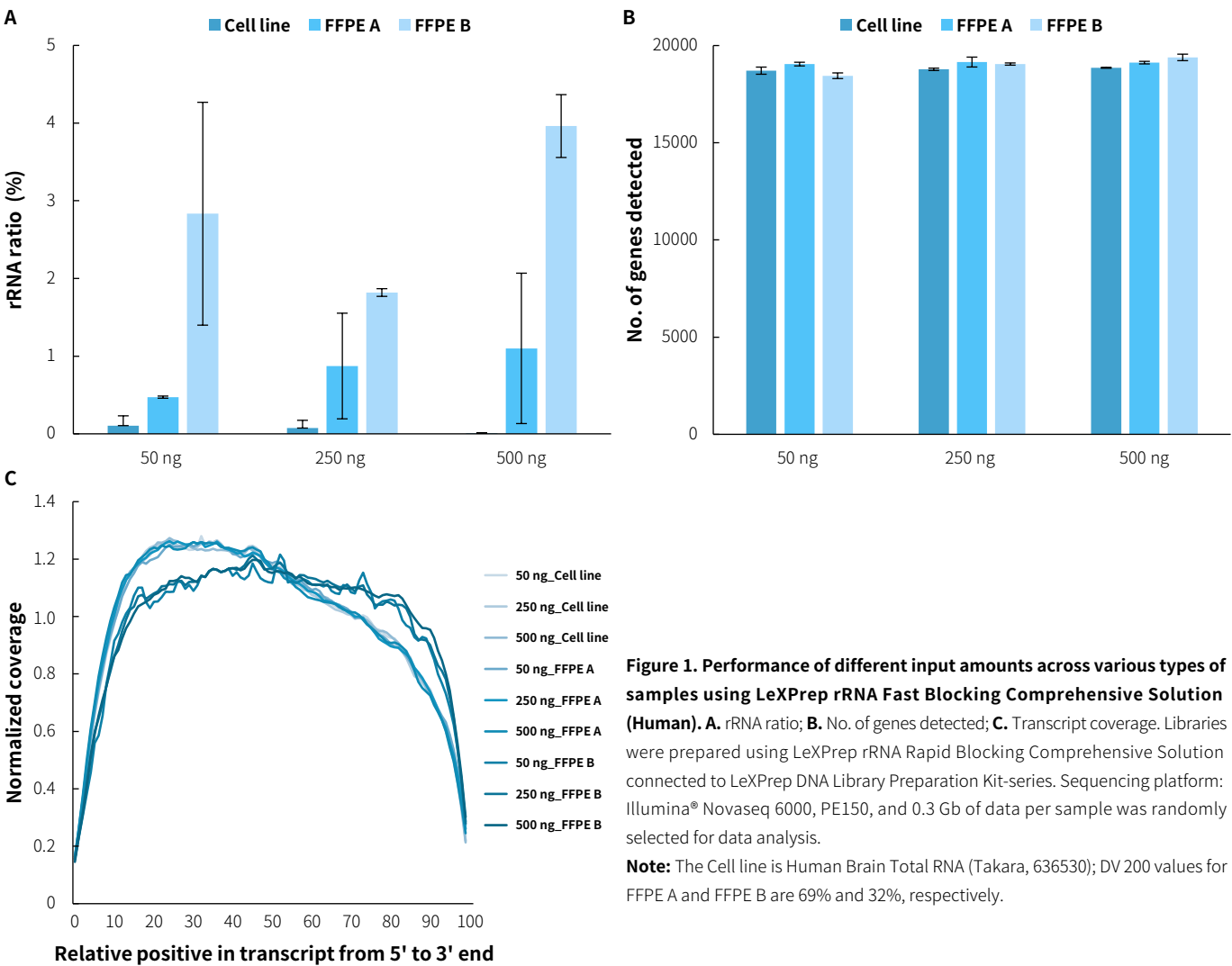
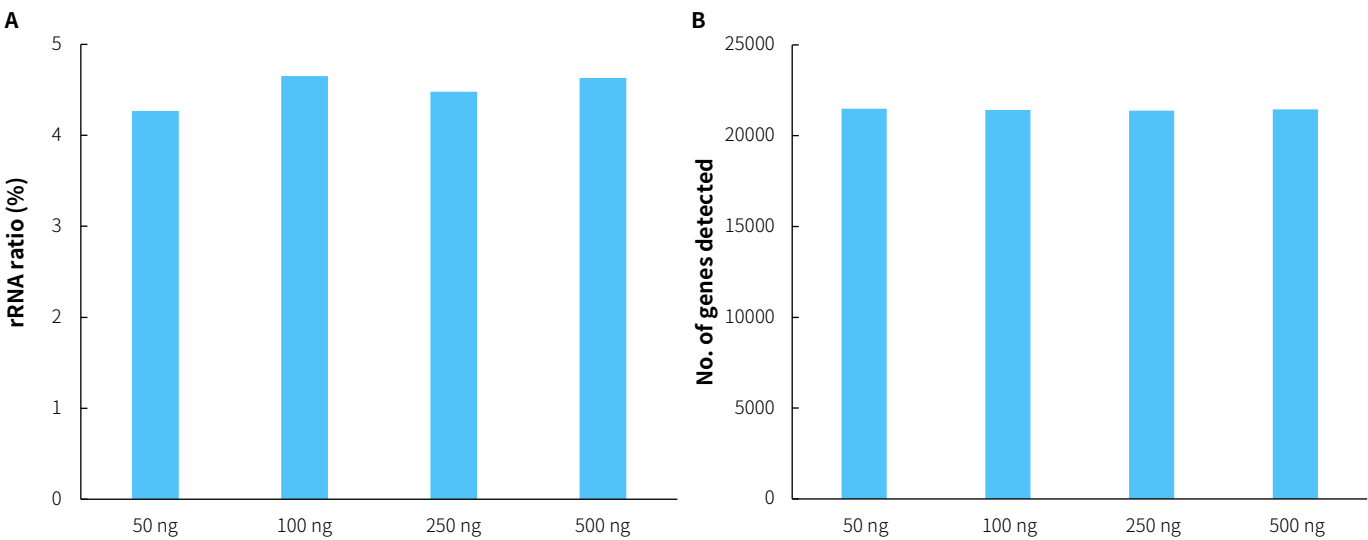


Figure 1. Performance of different input amounts across various types of samples using LeXPrep rRNA Fast Blocking Comprehensive Solution (Human). **A.** rRNA ratio; **B.** No. of genes detected; **C.** Transcript coverage. Libraries were prepared using LeXPrep rRNA Rapid Blocking Comprehensive Solution connected to LeXPrep DNA Library Preparation Kit-series. Sequencing platform: Illumina® Novaseq 6000, PE150, and 0.3 Gb of data per sample was randomly selected for data analysis.

Note: The Cell line is Human Brain Total RNA (Takara, 636530); DV 200 values for FFPE A and FFPE B are 69% and 32%, respectively.



(Continued)

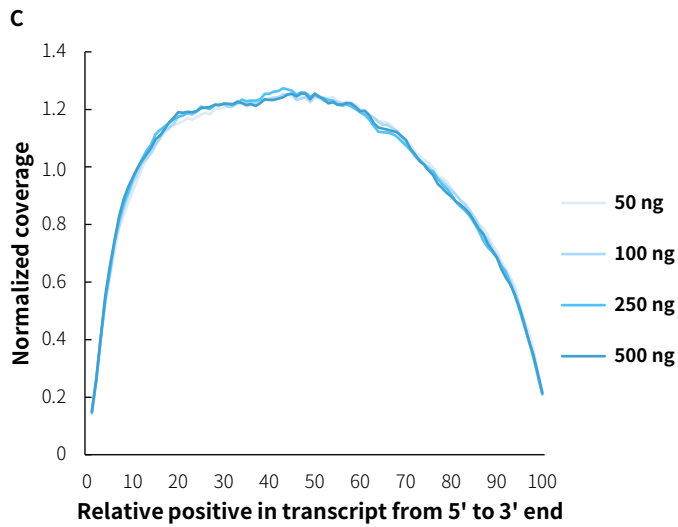


Figure 2. Performance of different input amounts of total RNA from zebrafish using LeXPrep rRNA Fast Blocking Comprehensive Solution (Zebrafish). A. rRNA ratio; B. No. of genes detected; C. Transcript coverage. Libraries were prepared using LeXPrep rRNA Rapid Blocking Comprehensive Solution (Zebrafish) connected to LeXPrep DNA Library Preparation Kit-series.

Compatible with Different Grades of FFPE Samples

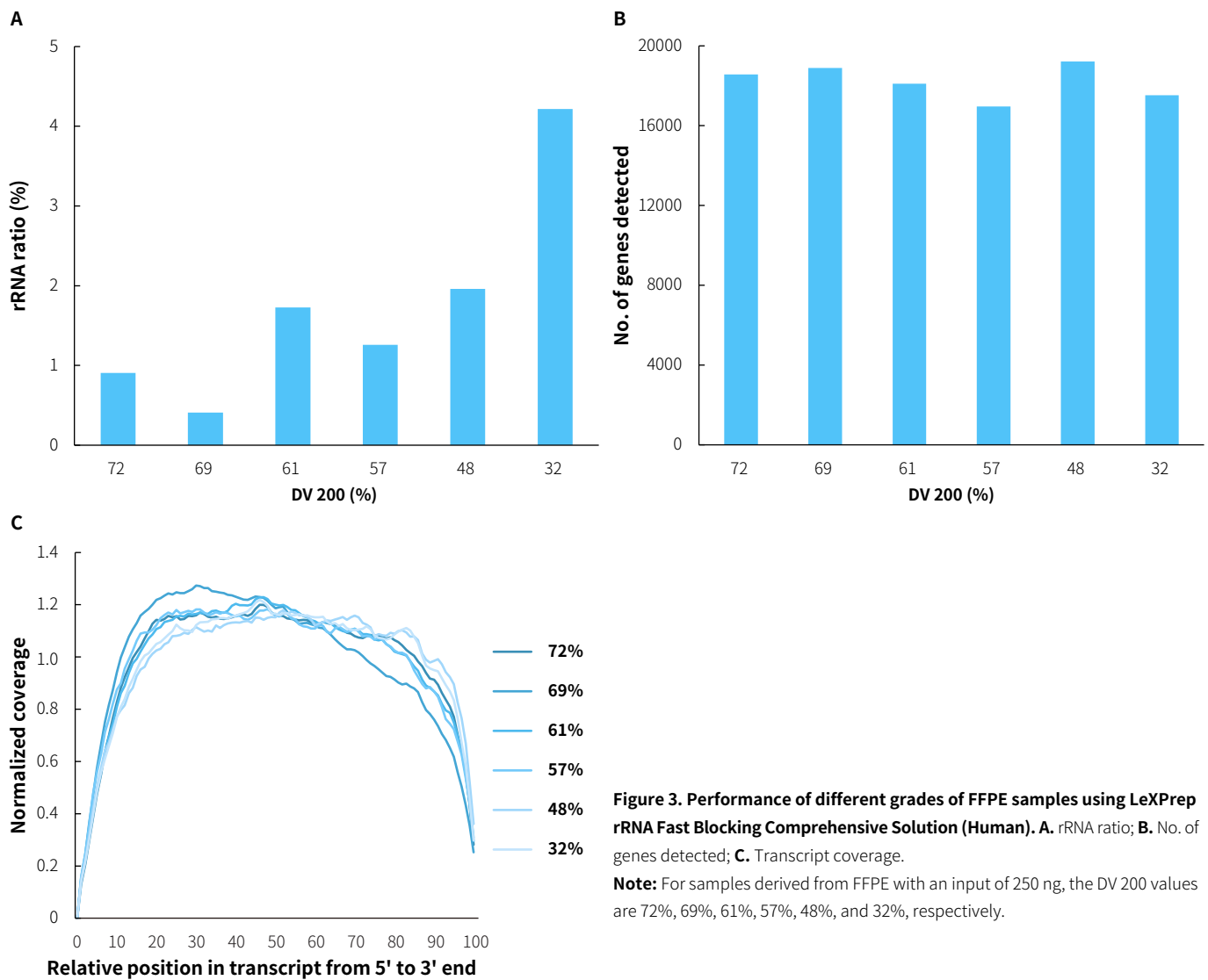


Figure 3. Performance of different grades of FFPE samples using LeXPrep rRNA Fast Blocking Comprehensive Solution (Human). A. rRNA ratio; B. No. of genes detected; C. Transcript coverage.

Note: For samples derived from FFPE with an input of 250 ng, the DV 200 values are 72%, 69%, 61%, 57%, 48%, and 32%, respectively.

Compatible with Third-party RNA Library Preparation Kits

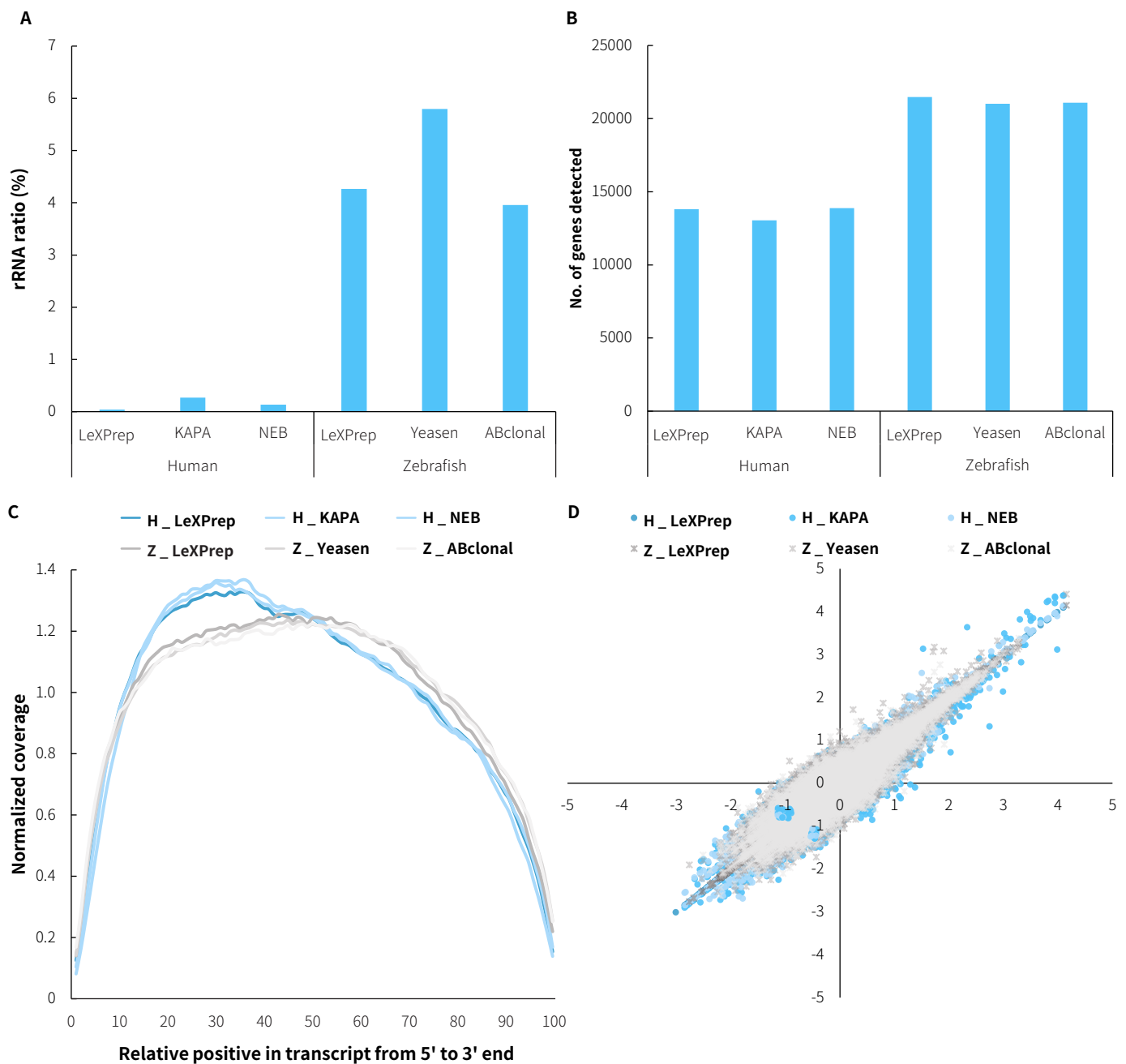


Figure 4. Performance of LeXPrep rRNA Rapid Blocking Comprehensive Solution (Human) in combination with third-party RNA library preparation kits. **A.** rRNA ratio; **B.** No. of genes detected; **C.** Transcript coverage; **D.** Expression profile correlation. A total of 250 ng of K562 cell line RNA were processed using LeXPrep rRNA Blocking Reagent in conjunction with LeXPrep Total RNA-To-DNA Module, followed by library preparation using LeXPrep DNA Library Preparation Kit-series, KAPA and NEB RNA Library Prep Kits. A total of 50 ng of zebrafish RNA was processed using LeXPrep rRNA Blocking Reagent (Zebrafish) in conjunction with LeXPrep Total RNA-To-DNA Module, followed by library preparation using LeXPrep DNA Library Preparation Kit-series, Yeasen and ABclonal RNA Library Prep Kits.

Note: H: Human; Z: Zebrafish.

Compatible with MGI and Illumina Sequencing Platforms

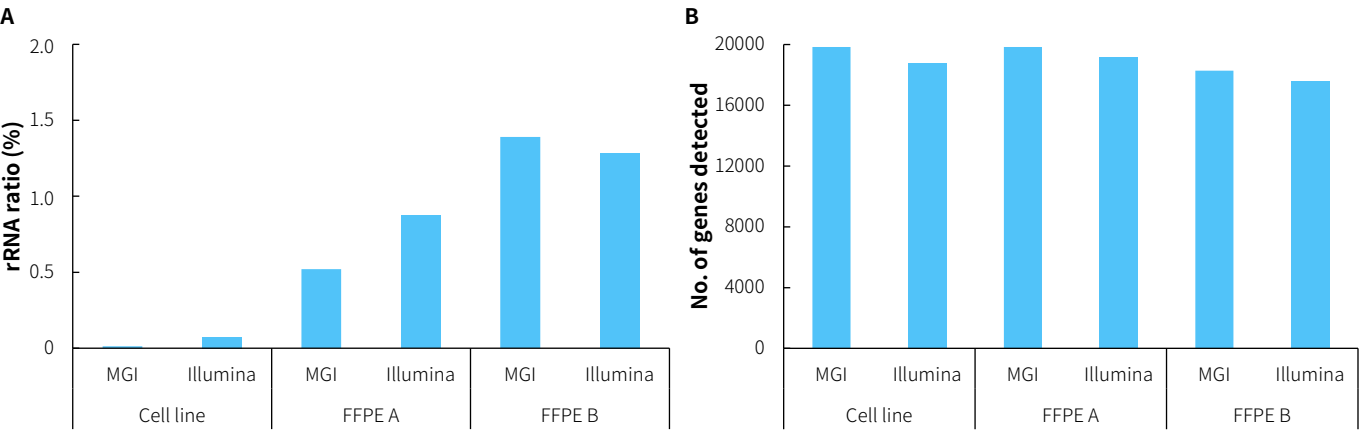


Figure 5. Performance of LeXPrep rRNA Fast Blocking Comprehensive Solution (Human) on dual sequencing platforms. A. rRNA ratio; **B.** No. of genes detected. With an input of 250 ng, libraries were prepared using LeXPrep rRNA Fast Blocking Comprehensive Solution connected to LeXPrep DNA Library Preparation Kit-series, coupled with LeXPrep Universal Stubby Adapter (UDI) Module and LeXPrep Universal Adapter (MDI) Module respectively. Sequencing platform: DNBSEQ-T7 and Illumina Novaseq 6000, PE150.

Competitive Comparison

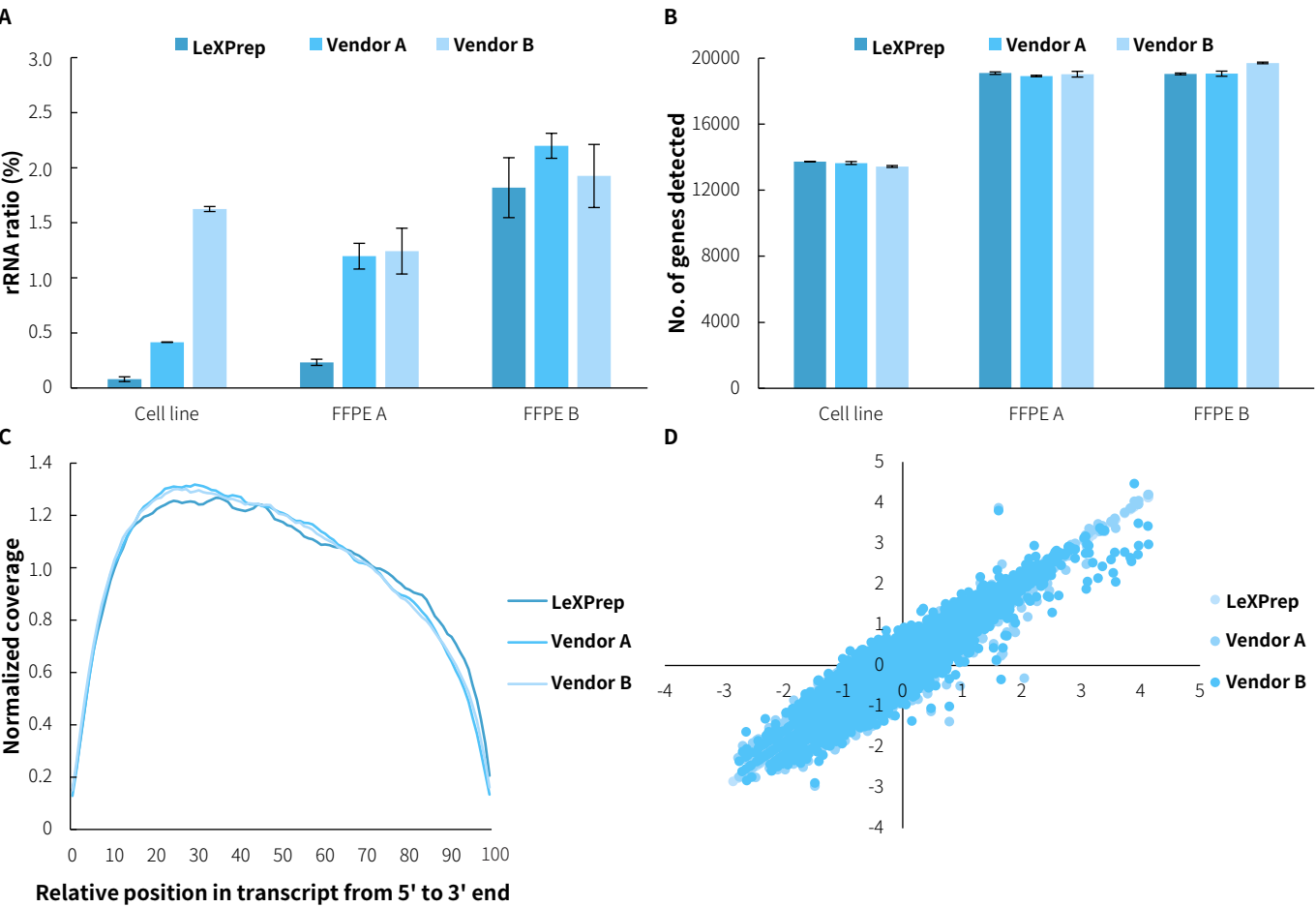


Figure 6. Performance comparison between LeXPrep rRNA Fast Blocking Comprehensive Solution and competitors. A. rRNA ratio; **B.** No. of genes detected; **C.** Transcript coverage; **D.** Expression profile correlation. With an input of 250 ng, libraries were prepared using LeXPrep rRNA Blocking Reagent, Vendor A, and Vendor B in combination with LeXPrep Total RNA-To-DNA Module.

Note: Vendor A refers to the rapid removal method, and Vendor B refers to the RNase H enzymatic method. C & D are shown only with the cell line (K562 RNA).

Ordering Information

Type	Applicable Specie	Product	Scale	Catalog#
rRNA Fast Blocking Reagent	Human	LeXPrep rRNA Blocking Reagent (Human), 24 rxn	24 rxn	LX02901
		LeXPrep rRNA Blocking Reagent (Human), 96 rxn	96 rxn	LX02902
	Zebrafish	LeXPrep rRNA Blocking Reagent (Zebrafish), 24 rxn	24 rxn	LX02911
		LeXPrep rRNA Blocking Reagent (Zebrafish), 96 rxn	96 rxn	LX02912
	Custom	LeXPrep rRNA Blocking Reagent (Custom)	/	LX029XX
Total RNA-To-DNA Module	All	LeXPrep Total RNA-To-DNA Module, 24 rxn	24 rxn	LX02401
		LeXPrep Total RNA-To-DNA Module, 96 rxn	96 rxn	LX02402

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