LEXIGENBIO

NGS Targeted Capture Total Solution

Library Preparation • Hybridization Capture • Ready-to-use or Custom Panels • MRD Detection
LeXso Hybrid System (Patented Technology) • Personalized DesignWorkflow • Automation • Bioinformatics

www.lexigenbio.com

Company Profile

LexigenBio is a genomics company focused on translating complex biological insights into actionable clinical diagnostics. Founded by Stanford University alumni with deep commercial experience in the Next-Generation Sequencing (NGS) industry, we are building an integrated ecosystem to overcome the critical bottlenecks in diagnostic development and deployment.

Our platforms are engineered for the demands of the modern clinical lab. **LeXso** technology enables ultra-sensitive results for challenging applications like liquid biopsy and MRD monitoring, all within a single-day workflow to dramatically reduce patient turnaround time. Our **LeXBot** systems provide the scalability and reproducibility essential for high-throughput diagnostic testing. Tying it all together is **LeXVerse**, our advanced AI engine, designed to power the development of novel companion diagnostics (CDx) and deliver clear, clinically relevant results. By integrating these core technologies, LexigenBio is creating a seamless path from sample to diagnostic answer, empowering our partners to bring the future of precision medicine to patients faster.

Contents

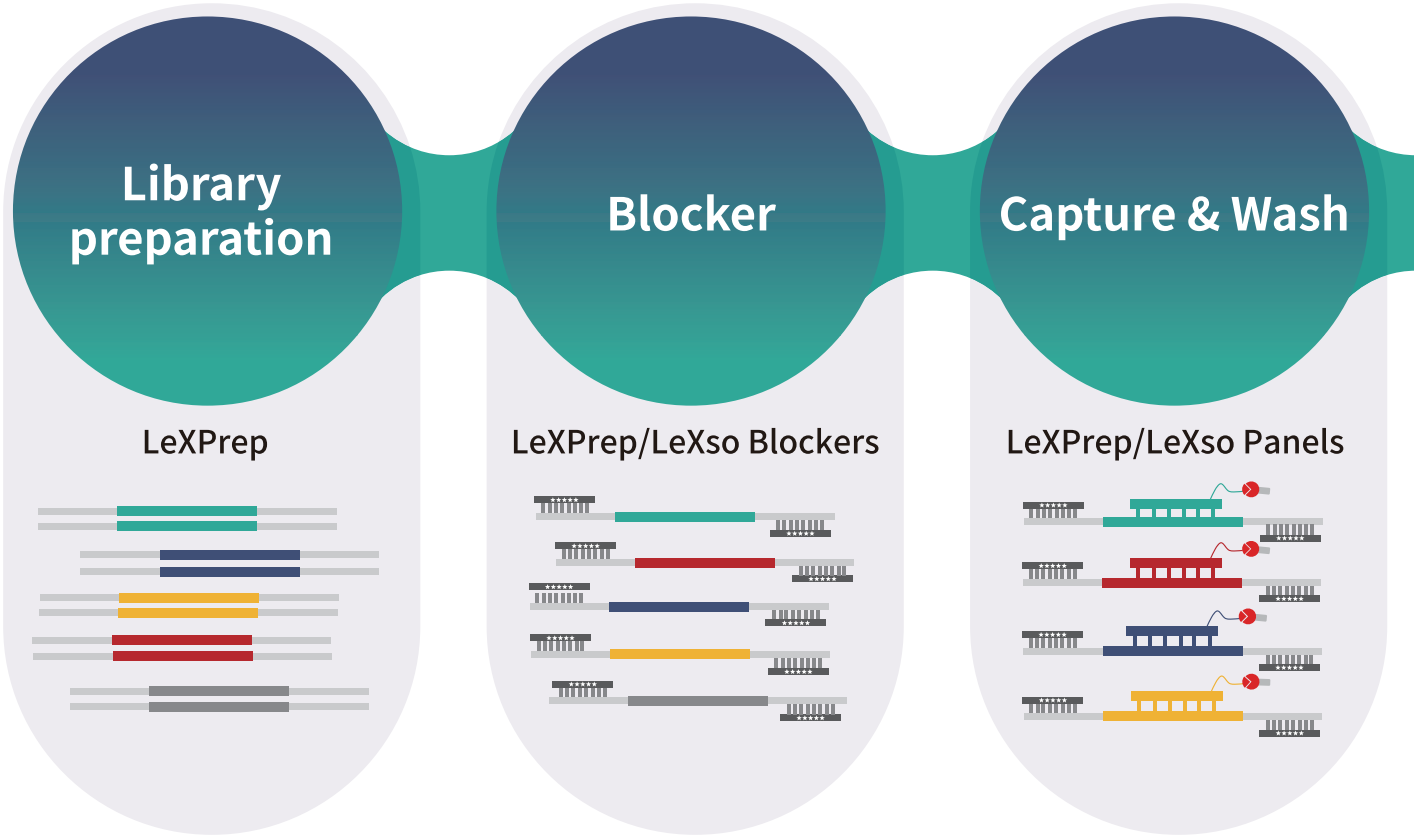
Core Value

Accuracy **Trust**

Compassion **Growth**

Targeted NGS by Hybridization Capture

Targeted sequencing refers to the enrichment and isolation of key genes and regions interested before sequencing. Compared with whole genome sequencing, targeted sequencing only performs high-depth sequencing on the target region, which can not only greatly improve the detection sensitivity, but also significantly reduce the cost of sequencing and data analysis. It has important application value in genetic variation detection, tumor screening, targeted therapy and other precision medicine fields.



Library preparation

Before sequencing, DNA or RNA samples must be prepared into library molecules with standard structures. The operation process generally includes the following steps: fragmentation, end repair, adapter ligation, amplification and purification.

Adapter

Specific sequence located at both ends of DNA fragments in complete library molecules for subsequent amplification and sequencing. The adapter generally contains one or more index sequences to identify library molecules from different samples.

Blocker

During the hybridization of the capture probe, the special DNA sequence was added and used to competitively bind the adapter sequence in the library molecule, which can reduce non-specific hybridization and increase the on-target rate.

Blockers

Probes

Streptavidin Beads

Post-capture amplification

Amplification reagents

Hybridization capture

Design biotin-modified capture probes, which bind to library molecules containing the target fragments in the liquid phase, and then use streptavidin magnetic beads to enrich the capture probes, unbound library molecules will be eluted, leaving the enriched target library molecules.

Star product

- Library Preparation Kits for mainstream platforms
- Universal Stubby Adapter (UDI, Unique Dual Index) supports for mainstream platforms within the same library , offering 768 options
- Pan-Cancer Panels for multiple variation detection - LeXOnco Plus Panel
- Co-detection System for methylation and mutation detection - LeXso Full Screen System

Various solution

- Personalized probe customization service
- Low-frequency mutation analysis
- LeXso Minimal Residual Disease (MRD) solution
- RNACap solution
- Whole Exome Sequencing (WES)
- MethylCap solution
- LeXso pathogen detection

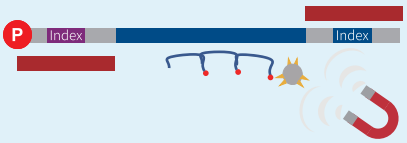
Service for CDx

- Fully-automated NGS workstation
- Homologous Recombination Deficiency (HRD) score analysis
- Respiratory virus detection
- Genetic disease testing
- Solid tumor/Hematologic tumor
- Early methylation screening
- IVD-grade targeted capture reagents

Hybridization Capture Workflow

The hybridization capture workflow typically begins with DNA fragmentation, achieved through either sonication (acoustic shearing) or enzymatic cleavage. For RNA samples, reverse transcription is performed to produce complementary DNA (cDNA), followed by library preparation using the double-stranded cDNA. For RNA & DNA mixed samples, a combined RNA & DNA library prep kit can be used directly to simplify the process. Prior to hybrid capture, synthetic DNA adapters are ligated to the fragmented DNA, and adapter-specific primers are used for PCR amplification. The amplified genomic libraries are then denatured and hybridized with biotin-labeled oligonucleotide probes. These probes bind to complementary sequences in the regions of interest in the genome, enabling selective capture.

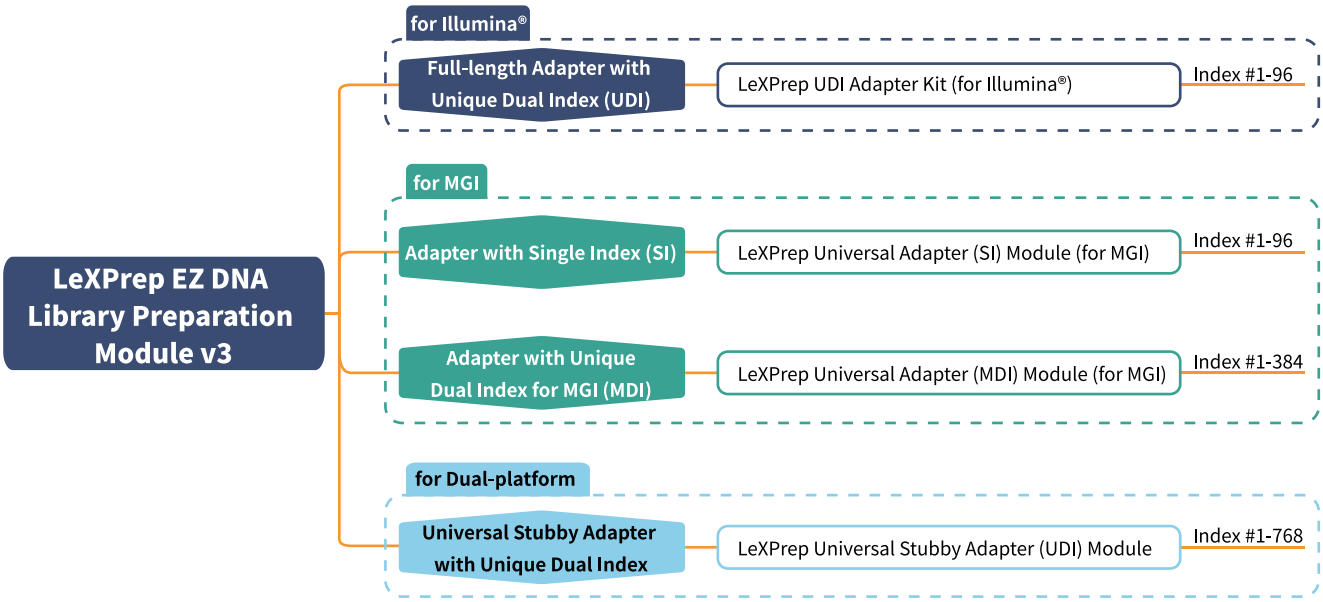
Using LeXsor Respiratory Pathogen (RP) Solution as an example, the complete workflow includes nucleic acid extraction, RNA & DNA co-library preparation, hybrid capture, NGS sequencing, bioinformatics analysis, and automated report interpretation. As illustrated in the schematic, the wet lab workflow **from library preparation to hybridization capture takes 6.5 hr**. Considering nucleic acid extraction, sequencing, and analysis, the **total TAT from sample to insight takes only 13.5 hr**.

Workflow	RNA & DNA	Duration	
	RNA & DNA mixture or RNA		**Pre-library Preparation** LeXPrep RNA & DNA Library Co-Preparation Module LeXPrep Universal Stubby Adapter (UDI) Module
	RNA Degeneration & Random Primer	5 min	
	1st Strand Synthesis	25 min	
	2nd Strand Synthesis	30 min	
	Fragmentation/End Repair & A-tailing (RNA & DNA mixture or DNA)	60 min	
	Adapter Ligation	15 min	
	Post-ligation Cleanup	30 min	
	Pre-library Amplification	15 min	
	Post-amplification Cleanup	30 min	
	Perform Hybridization	60 min	**Hybrid Capture** LeXso Hybrid Capture Reagents v2 LeXso Blockers (for Illumina®) LeXso RP Panel v1.0
	Perform Capture and Elution	30 min	
	Perform Post-capture PCR	30 min	
	Purify and Quantify Library	30 min	

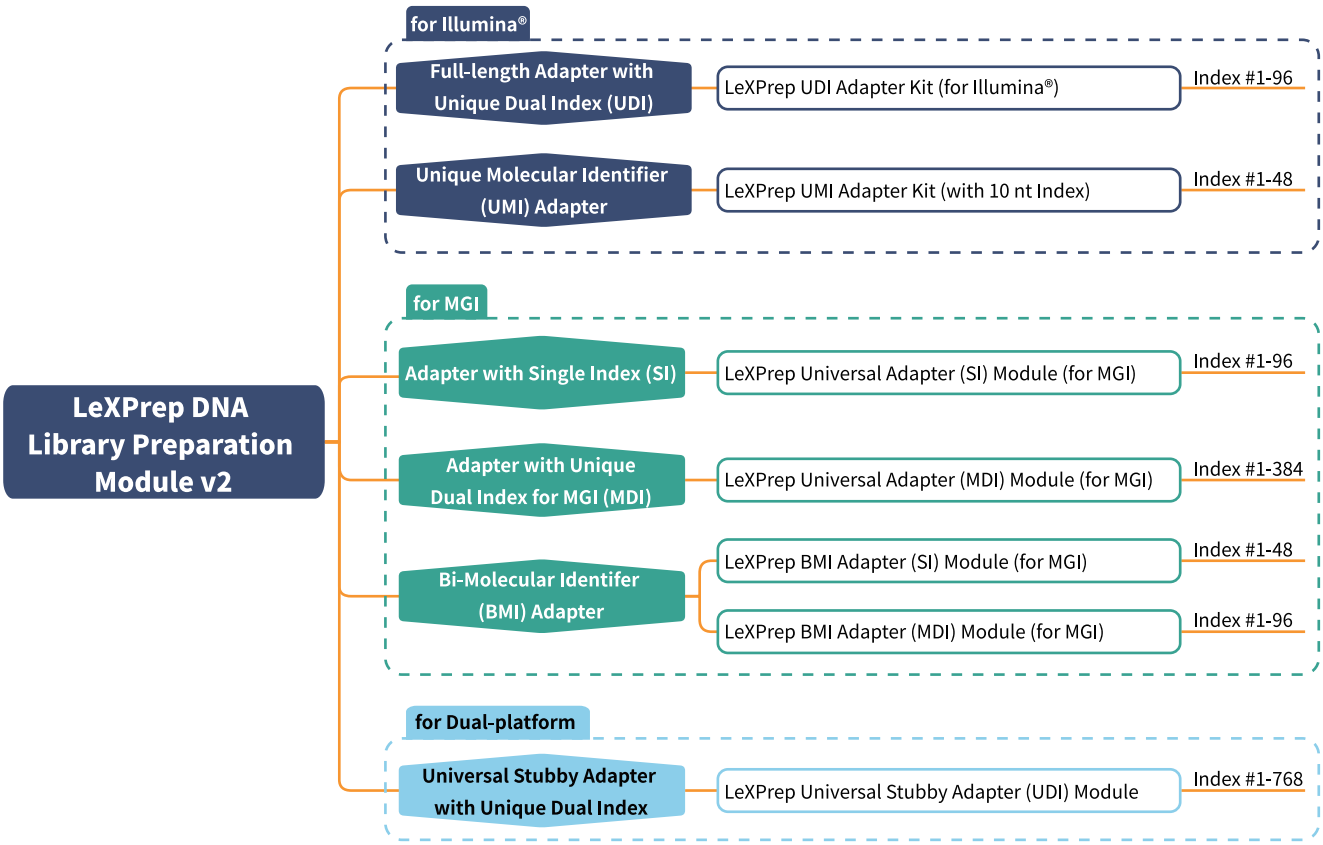
 LeXPrep Universal Stubby Adapter

Library Preparation Kits

LeXPrep EZ DNA Library Preparation Kit v3 consists of **LeXPrep EZ DNA Library Preparation Module v3** and selectable adapter modules. This kit utilizes enzymatic fragmentation, streamlining multiple processes into a single experimental step, including DNA fragmentation, end repair and adapter ligation. This kit is suitable for multiple DNA sample types including gDNA and FFPE DNA. It includes magnetic beads for DNA purification, and is fully optimized for size selection. At the same time, the adapter can be freely selected according to the sequencing platform and application scenario. All components have undergone rigorous quality control measures, demonstrating consistent and outstanding performance.



LeXPrep DNA Library Preparation Kit v2 consists of **LeXPrep DNA Library Preparation Module v2** and selectable adapter modules. This kit is suitable for multiple DNA sample types, including gDNA, cfDNA and FFPE DNA. It includes magnetic beads for DNA purification, and is fully optimized for size selection. At the same time, the adapter can be freely selected according to the sequencing platform and application scenario. The UDI adapters effectively reduce index-hopping and sample misassignment on sequencing platforms. While the UMI adapter, facilitates ultralow-frequency mutation analysis in tumor cells and cfDNA in plasma. All components have undergone rigorous quality control measures, demonstrating consistent and outstanding performance.

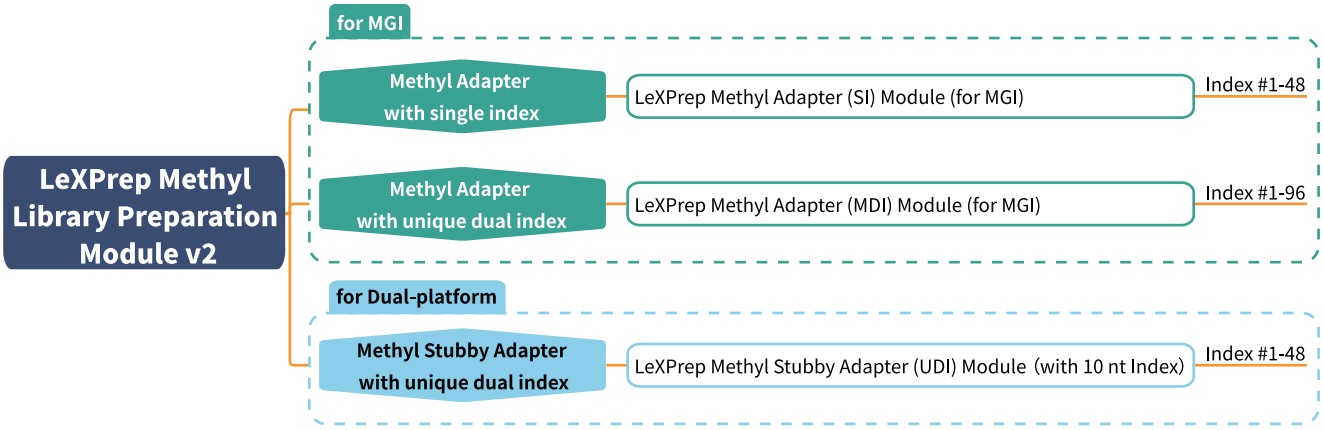


Feature of LeXPrep EZ Module v3

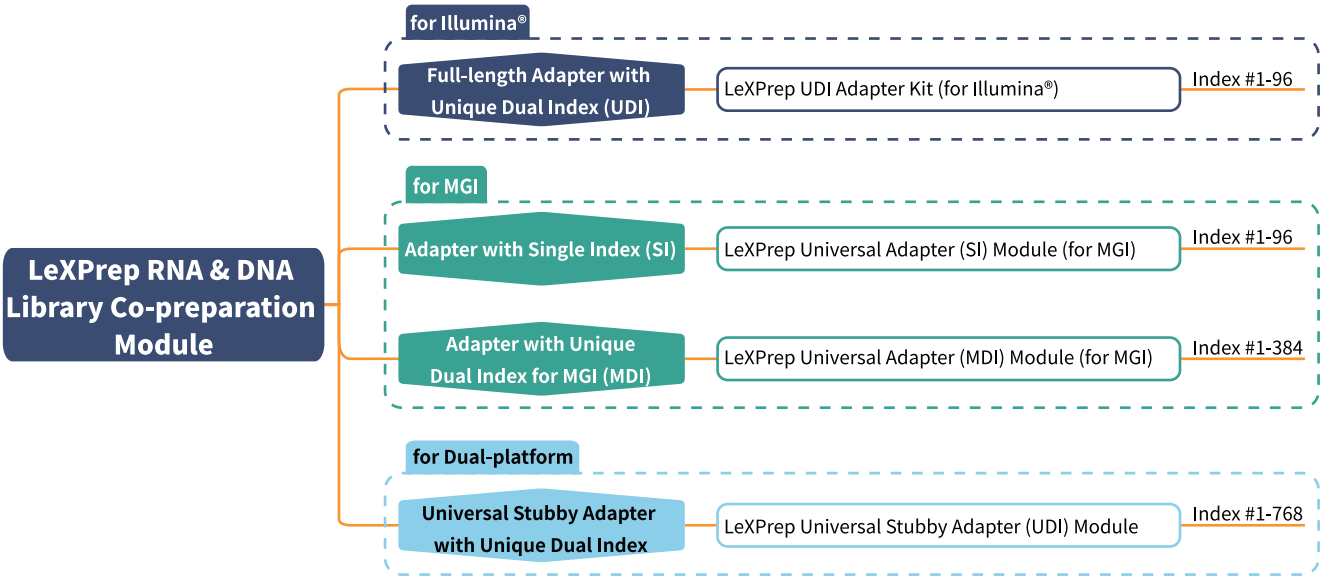
- Highly Suitable for various sample types, including gDNA and FFPE DNA of various grades (B+/B/C/D DNA).
- Flexible system and simple operation, with fragmentation, end repair and A-addition being completed in one step.
- The length of DNA fragment is flexible and controllable, enhancing enzymatic fragmentation recovery and library complexity.
- Maintains ultra-low background noise (abnormal sequence introduced by enzymatic digestion by-products) even with poor-quality samples, reducing false positives and improving the accuracy of variant detection.
- Flexible reaction system with excellent automation compatibility, seamlessly integrates with NGS workstations to reduce manual workload.

Library Preparation Kits

LeXPrep Methyl Library Preparation Kit v2 consists of **LeXPrep Methyl Library Preparation Module v2** and selectable adapter modules. It is suitable for multiple DNA sample types, including gDNA, cfDNA and FFPE DNA. In addition, it is compatible with various commercial methyl-seq conversion solutions, supporting a wide DNA input range from 1-500 ng. All components have undergone rigorous quality control measures, demonstrating consistent and outstanding performance.



LeXPrep RNA & DNA Library Co-preparation Kit consists of **LeXPrep RNA & DNA Library Co-preparation Module** and selectable adapter modules. It supports mixed samples with varying ratios of 10-100 ng RNA and 1-100 ng DNA, and can complete library preparation of mixed samples of pathogenic microorganisms in a single reaction system. It is also compatible with liquid-phase hybridization targeted capture sequencing. All components have undergone rigorous quality control measures, demonstrating consistent and outstanding performance.



Others

Lib-prep by Multi-PCR

LeXPrep IGTR Multiplex PCR Library Prep Kit is based on the principle of multiplex amplification, enabling efficient enrichment of the complementary determining regions (CDR3) of seven loci for human adaptive immune antigen receptors, including *IGH / IGK / IGL* and *TRA / TRB / TRG / TRD.* Combined with high-throughput sequencing technology, this kit facilitates precise detection of B-cell and T-cell diversity and clonality.

rRNA Blocking

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.

Methyl Lib-prep

LeXPrep DNA Methyl Bisulfite Conversion Module is a methylation conversion reagent developed for DNA samples based on the principle of bisulfite conversion. The conversion module, based on a magnetic bead purification protocol, efficiently converts unmethylated cytosine to uracil within 2 hr, leaving methylated cytosine unchanged, and it can be compatible with automated workstations.

RNA-To-DNA

LeXPrep Total RNA-To-DNA Module is a reverse transcription module developed for NGS platform. This module offers an efficient solution for the generation of dsDNA fragments from 10-200 ng of Human total RNA from cells, tissues and FFPE samples. The dsDNA output can couple with the LexPrep DNA Library Preparation kit.

Lib Circularization

LeXPrep Universal Circularization Kit v2 is designed for preparation of a single-stranded circular DNA (ssCirDNA) library for the MGI platform based on DNBSEQTM technology. The circularization module inside is compatible with the circularization of libraries with single index (SI) adapters and dual index (DI) adapters on MGI platform, and LeXPrep Universal Stubby Adapters (UDI), and is suitable for the circularization of libraries converted by the MGIEasy Universal Library Conversion Kit (App-A), with the preparation of single-stranded circular libraries effectively streamlined.

Hybrid Capture System

3 Options for You

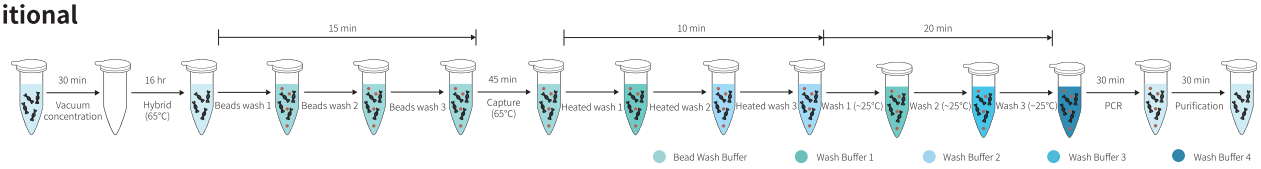
LexigenBio offers a selection of three distinct hybrid capture systems: the traditional overnight hybridization (Traditional), the rapid hybridization (ES), and the internationally patented exclusive technology: LeXso Hybrid System (LeXso).

The composition, characteristics, and application positioning of these three hybrid capture systems are delineated as follows:

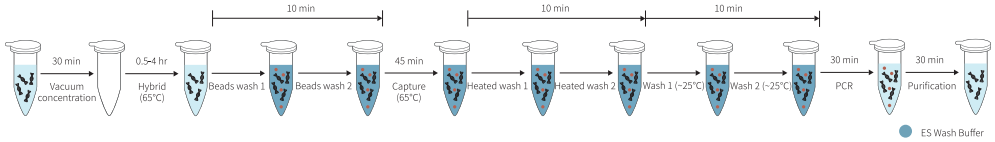
	Traditional	ES	LeXso
Hybrid Buffer	**LeXPrep Hybrid Capture Reagents**	**LeXPrep ES Hybrid Capture Reagents**	**LeXso Hybrid Capture Reagents v2**
Blocker	• LeXPrep Blockers (for MGI, SI) • LeXPrep Blockers (for MGI, DI) • LeXPrep Blockers (for Illumina®)		• LeXso Blockers (for MGI, DI) • LeXso Blockers (for Illumina®)
Probe length	120 nt DNA/RNA probes		20-100 nt DNA probes
Panel size	Usually ＞100 Kb		0 ＜ x ⩽ 100 Kb
Concentration	Yes		No
Time of hybrid	16 hr	0.5-4 hr	1 hr
Time of capture	45 min	45 min	10 min
TAT	~ 19 hr	~3.5-7 hr	~2.5-3.5 hr
Applications	• Whole exome sequencing • Cancer Comprehensive Genomic Profiling (CGP) • Genetic testing • Targeted mNGS		• Minimal residual disease • Cancer early detection • Cancer CGP (mini Panel) • Targeted mNGS

★ Workflow

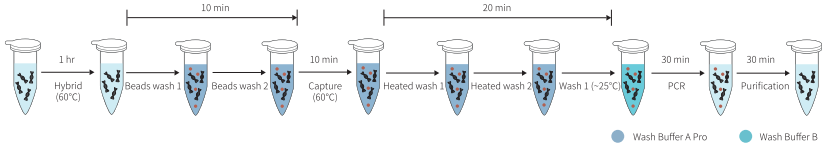
Traditional



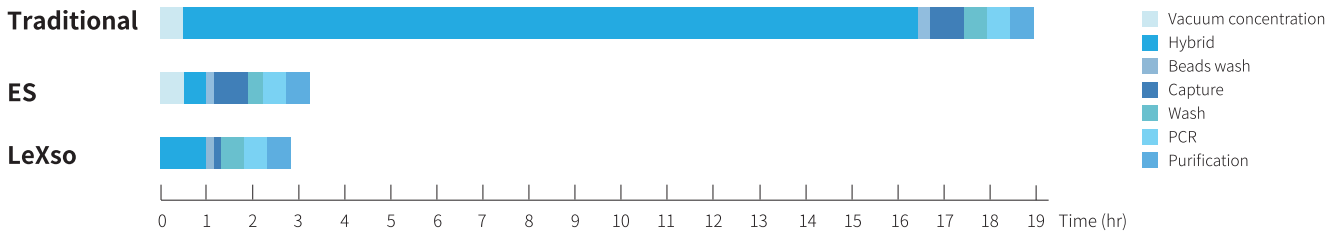
ES



LeXso



★ Duration



Note: The schematic diagram above illustrates the process of conventional DNA library hybrid capture, not methylated DNA library.

Targeted NGS-based
Commercial Panels / Personalized Customized Probes

LexigenBio specializes in targeted sequencing and offers a diverse range of validated commercial panels. These panels enable various applications, including but not limited to WES analysis, solid tumor detection, MRD monitoring, HRD score analysis, multi-cancer methylation screening, respiratory virus detection, immune repertoire analysis, HLA typing analysis, fusion analysis, and more. In addition, personalized probe customization services are available. All probes are independently synthesized, subjected to quality control checks, and individual concentration determined.

Inherited genetic diseases detection						
Solutions	**Product**	**No. of genes**	**Panel size**	**Specimen**	**Biomarker**	**Applications**
Universal Genetic Diagnostic	LeXome Mini Panel v1.0	5,650 (designed for inherited disease)	16.1 Mb	DNA	SNV, InDel, CNV, TMB, HLAtyping, TCR/BCR, recombination	• Newborn screening • Genetic diagnostics • R&D user • Carrier screening
	LeXome Core Panel	19,613 (only with coding sequence covered)	41.7 Mb	DNA	SNV, InDel, CNV, TMB, HLAtyping	
	LeXome Plus Panel v1.0	~20,000 (strengthened for cancer diagnostics)	43.3 Mb	DNA	SNV, InDel, CNV, TMB, HLAtyping, Fusion, MSI	
	LeXome XP Panel v1.0	20,772 (strengthened for genetic diagnostics)	45.9 Mb	DNA	SNV, InDel, CNV, TMB, HLAtyping, Fusion, MSI, TCR/BCR, recombination	
Common Genetic Problems	LeX HLAtyping Panel v2.0	Class-I / II HLA genes (for human leukocyte antigen genotyping)	/	DNA	HLAtyping	• Medical transplant • Registered donor
	LeX HGBP Panel v1.0	HBA, HBB, BCL11A, HBS1L, KLF1, MYB (for thalassemia diagnostics)	160 Kb	DNA	SNV, InDel, CNV, recombination	• Carrier screening • Thalassemia diagnostics
	LeX IGTR Panel v1.0	entire IG and TR coding gene segments	/	RNA/DNA	TCR/BCR	• TCR/BCR analysis
	LeX DMD Research Panel v1.0	entire *DMD* gene sequence	~ 2.2 Mb	DNA	SNV, Indel, CNV	• Carrier screening • DMD diagnostics

Solid tumor comprehensive genetic profiling						
Solutions	**Product**	**No. of genes**	**Panel size**	**Specimen**	**Biomarker**	**Applications**
Pan-cancers	LeXOnco Plus Panel v3.0	637	2.4 Mb	DNA	SNV, InDel, CNV, TMB, Fusion, MSI, recombination	• Solid tumor companion diagnostics (CDx)
Pan-cancers (Fusion)	LeXOncoFu Elite (for RNA) Panel v1.0	105	/	RNA	SNV, InDel, CNV, Fusion	
Pan-cancers (HotSpot)	LeXso HotSpot Panel v1.0*	49	25 Kb	DNA	SNV, InDel, CNV	
Pan-cancers (ctDNA)	LeXOnCT Panel v1.0	69	375 Kb	cfDNA	SNV, InDel, CNV, Fusion, recombination	• Liquid biopsy
LungCancer	LeX LungCancer Panel v1.0	24	~ 218 Kb	DNA	SNV, InDel, CNV, Fusion, recombination	• Lung cancer (CDx)
Ovarian, Breast, Prostate, and Pancreatic Cancers	LeX HRR Panel v1.0	35	151 Kb	DNA	SNV, InDel, CNV	• Screening for beneficiaries of PARP inhibitors • HRD score
	LeX HiSNP Ultra Panel v1.0	/	/	DNA	HRD	

Blood cancer comprehensive genetic profiling						
Solutions	**Product**	**No. of genes**	**Panel size**	**Specimen**	**Biomarker**	**Applications**
AML MRD	LeXso AML Panel v1.0*	32	42.5 Kb	DNA	SNV, InDel, CNV, Fusion	• MRD monitor
Blood cancer	LeXHema Panel v2.0	481	1.7 Mb/null	DNA/RNA	SNV, InDel, CNV, Fusion, recombination	• Blood cancer diagnostics

Methylation detection					
Solutions	**Product**	**No. of genes**	**Panel size**	**Specimen**	**Applications**
DNA Methylation	LeXso EMS Panel v1.0*	76 (~2,000 CpG loci)	20 Kb	DNA	• Methylation early screening
Co-detection of methylation and mutation	LeXso FS EMS+ Panel v1.0*	163 (~1,800 CpG loci)	0.1 Mb	DNA	• Methylation early screening and MRD monitor

Pathogens detection					
Solutions	**Product**	**No. of pathogens**	**Panel size**	**Specimen**	**Applications**
Respiratory pathogens	LeXso RP Panel v1.0*	/	/	RNA/DNA	• multiplex pathogen co-detection
Coronavirus Disease 2019	LeXso SARS-CoV-2 Panel v1.0*	1	29.9 Kb	RNA	• SARS-CoV-2 surveillance
Respirovirus	LeX Respiratory Virus Panel v1.0-Tech Access	36	/	RNA	• Respirovirus infection detection

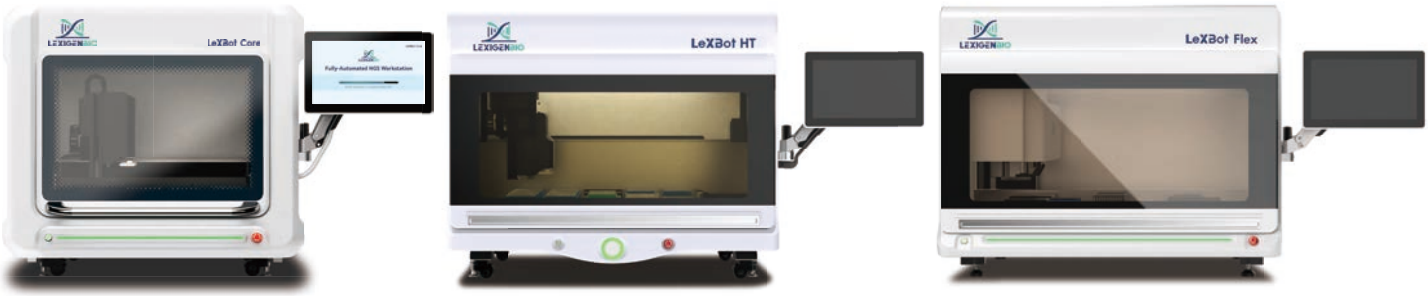
* indicates that these panels must be used in conjunction with LeXso Hybrid Capture System.

If you require a customized design for specific diseases or genes, please contact us for professional, personal advice.

support@lexigenbio.com

LeXBot-series
Fully-automated NGS Workstation

LexigenBio integrates hardware and software components to develop a fully automated NGS workstation, featuring the **LeXBot Core Fully-automated NGS Workstation**, **LeXBot HT Fully-automated NGS Workstation** and **LeXBot Flex Fully-automated NGS Workstation**. Leveraging extensive expertise in NGS reagent development and application, LexigenBio strives to address the need for automation of complex NGS workflows, thereby enhancing service efficiency.

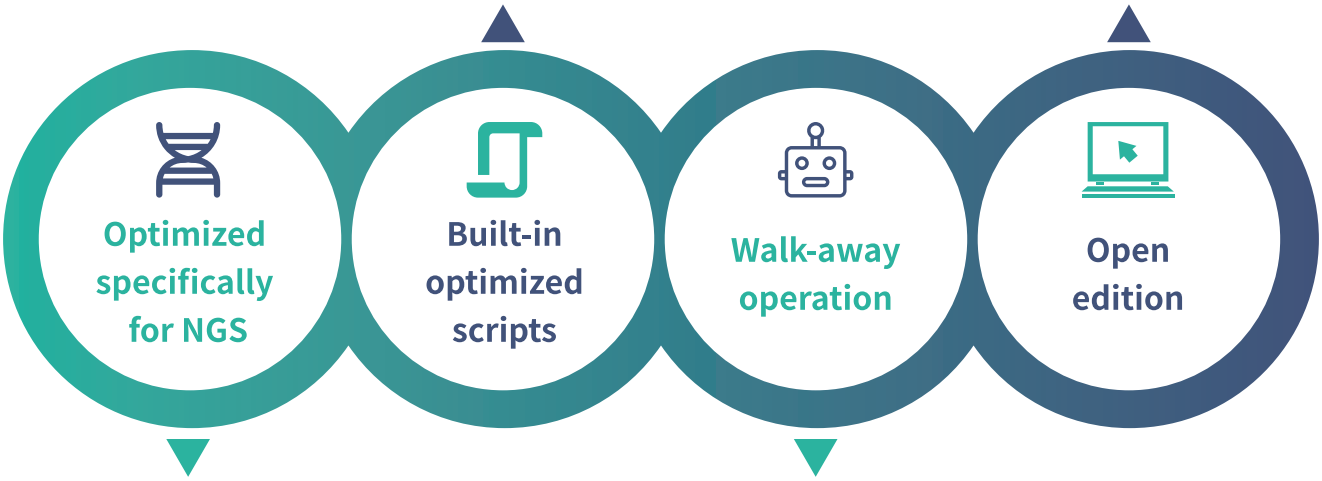


Multidimensional comparison		LeXBot Core	LeXBot HT	LeXBot Flex
Throughput		Low throughput	High throughput	Flexible throughput
No. of SBS Standard Plate Positions		12	24	20
No. of Thermal Cyclers		1	1	1
No. of Temperature Control Modules		2	2	2
No. of Heating and Oscillating Modules		1	1	1
No. of Purification Modules		1 (movable)	2 (1 movable & 1 liftable)	2 (1 movable & 1 liftable)
No. of Purification Modules		-	1	1
HD Camera		-	1	1
Pipetting Channels		8-channel	24-channel	4 independent channels
Library Preparation*	Recommended Throughput	16	48	1~16
	Duration (hr)	3	3.5	⩽4
Hybrid Capture**	Recommended Throughput	8	24	1~8
	Duration (hr)	6	7	⩽7
Application Scenarios		Small scale	Large scale	Unstable sample quantities
		Genetic disease diagnosis, Non-invasive prenatal testing (NIPT), Tumor companion diagnosis, Tumor early screening, Tumor recurrence monitoring, Infectious pathogen identification, Pre-implantation embryo screening, etc.		

*indicates taking the LeXPrep DNA Library Preparation Kit Plate as an example. ** indicates taking the LeXPrep ES Hybrid Capture System as an example.

- Pre-set scripts for targeted NGS workflow
- Pre-set scripts are validated and ready for immediate use

- Supports third-party reagent kits and script customization
- Visual editing software for drag- and-drop script writing



- Compatible with the full range of library preparation and hybrid capture reagent products
- Stable and reproducible results

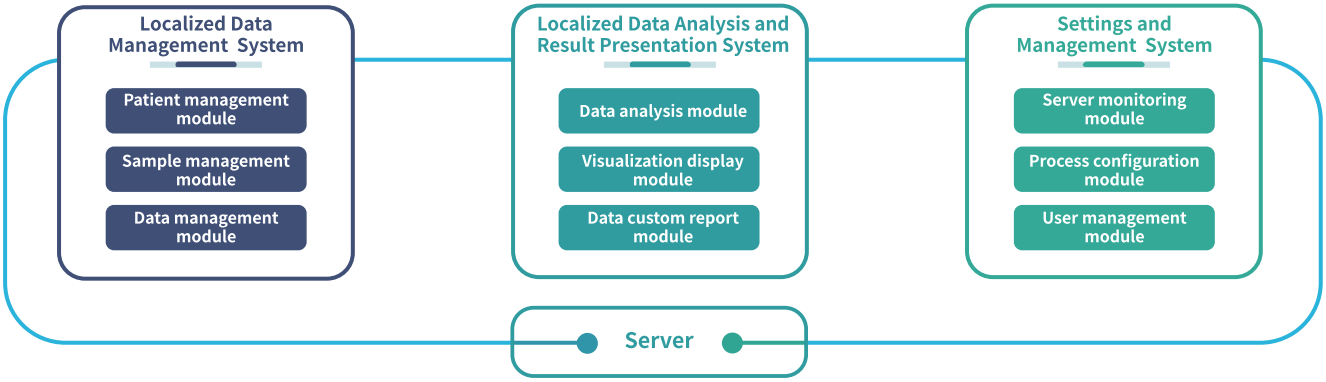
- Significantly reduces manual operation time
- Seamlessly integrates functional modules without human intervention

Application	Pre-set script	LeXBot Core (fixed throughput)		LeXBot HT (fixed throughput)					LeXBot Flex (flexible throughput)	
		8	16	8	16	24	32	48	1-16	1-8
Library Preparation	within Fragmentation (Enzymatic)	√	√	○	○	√	○	√	○	—
	without Fragmentation	√	√	○	○	√	○	√	○	—
	RNA & DNA Lib Co-prep	√	√	○	○	○	○	○	○	—
	Methyl Lib-Prep	√	√	○	○	○	○	○	○	—
Hybrid Capture	Overnight	○	—	○	○	○	—	—	—	○
	ES Rapid	√	—	○	○	√	—	—	—	√
	LeXso Conventional	√	—	○	○	○	—	—	—	○
	LeXso Methylation	√	—	○	○	○	—	—	—	○

√ indicates existing application scripts; ○ indicates application scripts under development; — indicates that the model does not support it.
*Restricted to the concentration methods.

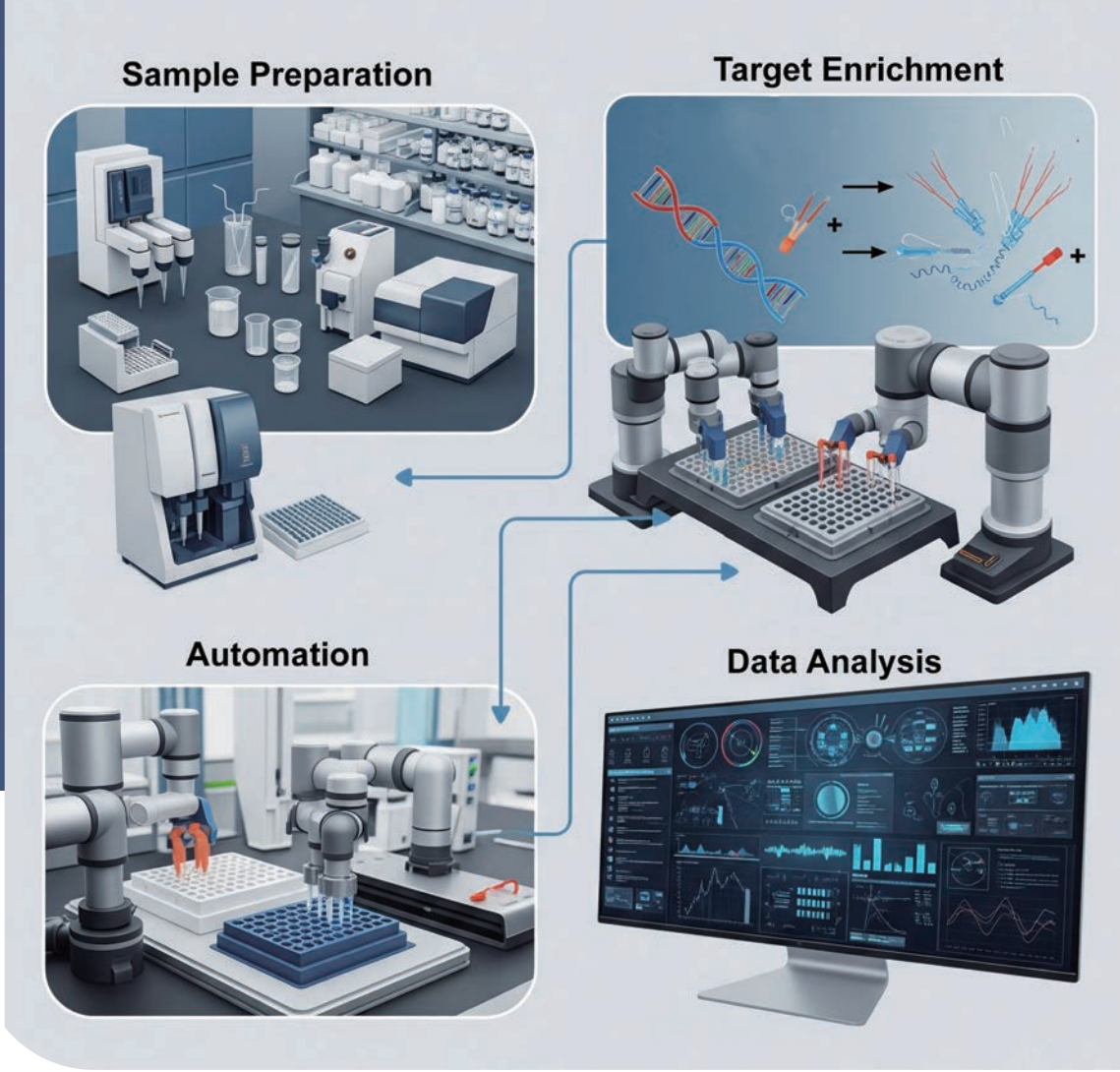
LeXee Bioinformatics Analysis Visual System

LexigenBio has developed an online Bioinformatics Analysis Visual System named LeXee. This system is designed to aid users with sequencing data, particularly labs lacking expertise or having limited understanding of bioinformatics, in uncovering potential genetic and pathogenic insights within their datasets. The system is comprised of three main modules: the Localized Data Management System, the Localized Data Analysis and Result Presentation System, and the Settings and Management System.

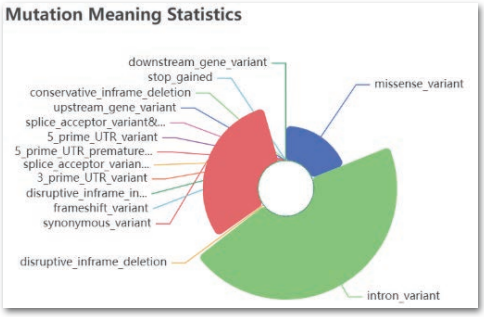


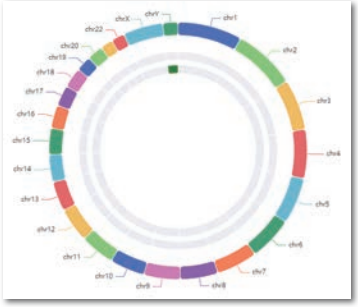
Processing Workflow

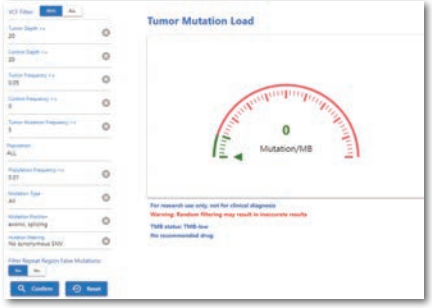
- **Categorize** by department, cause, sampling site, patient demographics, time, location, age, etc.
- **Choose** an appropriate analysis workflow based on the capture reagent kit and the number of samples to be analyzed.
- **Select** data corresponding to the capture reagent kit for the chosen analysis workflow, ensuring careful consideration of patient sources for paired data analysis.
- **Display** the current analysis progress and modules on the task interface and **Provide** possible reasons in case of analysis failure.
- **Utilize** flexible chart formats based on the coverage of the capture reagent kit to visually present analyzable content.

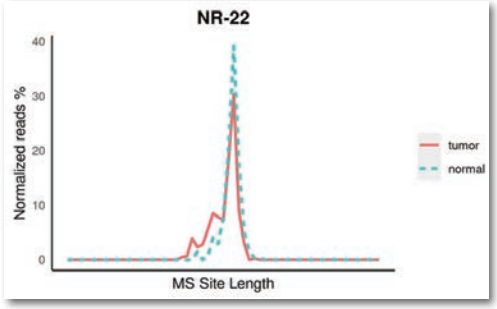


Result Visualization Display









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