

LeX Custom Panel/Probe Design and Synthesis: Precision-Engineered Genomics



Custom Panel Design



Probe Synthesis



LeX Probes

Background

Capture probe customization is a service specially designed by LexigenBio to help users design targeted capture probes for sites of interest. This service targets any coding or non-coding region of the genome or transcriptome, and the base sequence in the target region is efficiently captured through a multi-factor evaluation algorithm, thereby ensuring the overall on-target rate and high coverage of the target region.

Compared with commercial panels, custom probes are more flexible, and can be specifically designed according to the information of the target gene locus of interest, which is more targeted and avoids the redundancy of sequencing information.

Capture probe customization can be used for the detection of mutation types such as gene point mutation (SNP), insertion/deletion (indel), copy number variation (CNV) and structural variation, as well as for tumor mutation burden (TMB), microsatellite instability (MSI) and other tests to make special design. It can play an important role in clinical diagnosis research, drug development, individualized drug-related genes and disease susceptibility gene mutation discovery, and also has great application potential in pathogenic microorganism research and agricultural breeding research.

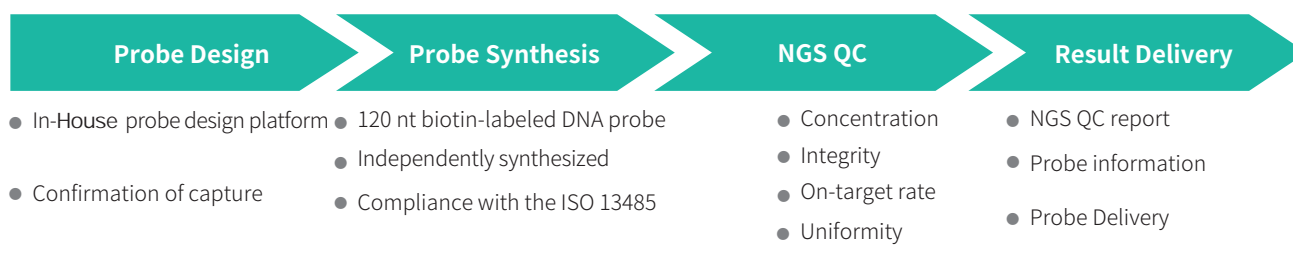
Introduction

LeX Probe is a one-stop service created by LexigenBio, covering the entire process from probe design, probe production, quality inspection, optimization, and result delivery. Through strict quality control (QC) and optimized NGS QC services, we can provide our customers with high-quality customized hybridization capture solutions, covering the application types in addition to conventional mutation detection, which include methylation capture, RNA capture, and virus capture.

Features

- Clarified sequence and known concentration for each probe
- In compliance with the ISO13485 system production standard, providing uniform and stable results
- Good uniformity of coverage, low GC bias
- Support spike-in to other LeXPanels or customized panels
- Support hybridization capture of multiple samples

Content of Customized Service



Production & Quality Control

Independently Synthesized and inspected for Quality

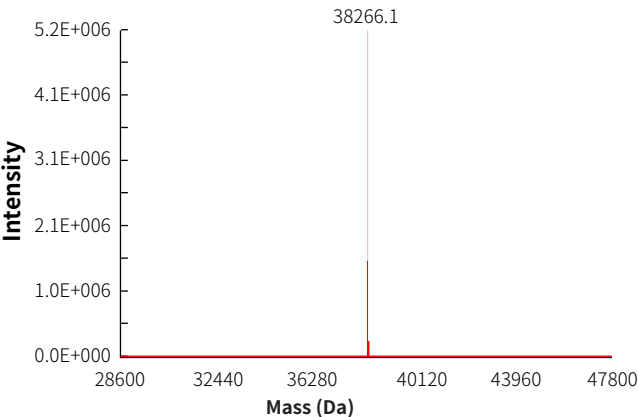


Figure 1. Mass spectrometry results of a single probe from LeX Probes.

The theoretical molecular weight was 38260.80 Da, and the mass spectrometry results showed that the measured molecular weight was 38266.1 Da.

Table 1. Examples for analysis detection of each probe.

NO.	Extinction coeff	Calculated M.W.	Measured M.W.	M.W. deviation
1	1131800	37171.44	37170.5	0.00%
2	1156000	38260.80	38266.1	0.01%
3	1218600	37503.80	37501.5	-0.01%
4	1147700	37360.48	37366.5	0.02%
5	1169300	37259.52	37258.3	-0.02%

NGS QC

Table 2. Examples for NGS QC detection content and results.

Product information		Test & Results	
Product	LeX Probes, 96 rxn	Appearance	Without damage
Catalog No.	LX01223	Functional performance	Probe present: > 99.9%
Description	xxxxxxx	Functional performance	Probe concentration: \pm 10%
Design ID	xxxxxxx	Capture advice	Good
Batch	24022115401	Result	Pass

Performance

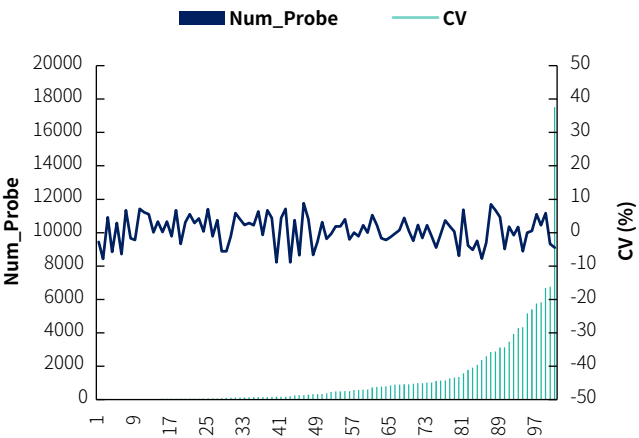


Figure 2. Concentration deviation of different customized probe numbers. One hundred tubes of customized probes were randomly selected, the number of probes varied from 10 to 17,000, and the probe concentration deviation was within \pm 10%

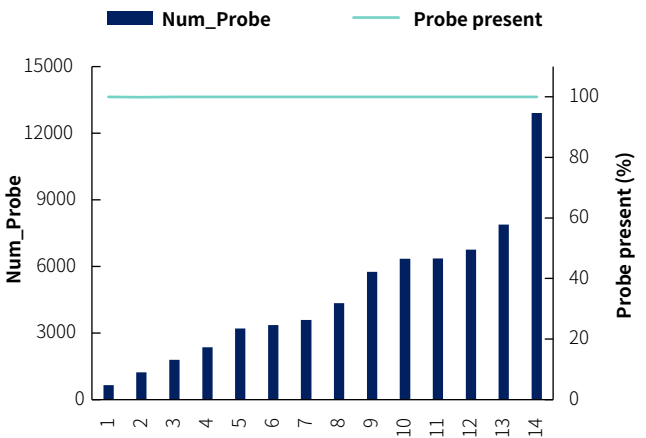


Figure 3. Evaluation of the stability of customized probe synthesis by Probe Present. Different batches of customized probes were randomly selected, and the Probe Present results of multiple different batches of probes were above 99.9%.Note: Probe Present: The proportion of probe regions with average sequencing depth greater than 10x when the average sequencing depth is 200x.

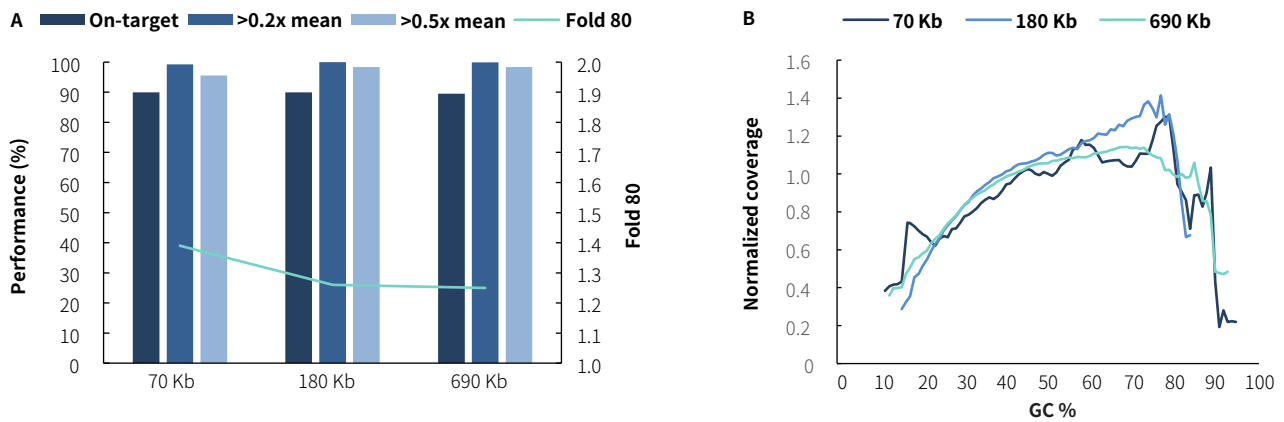


Figure 4. Capture performance of DNACap panel. The library for human male genomic DNA (Promega, G1471) samples was constructed using the LeXPrep DNA Library Preparation Kit (for Illumina®). Three customized panels were respectively used to complete hybridization capture. Sequencing platform: Illumina NovaSeq 6000, PE 150. **A.** On-target rate, targeted region coverage, and Fold 80; **B.** Uniformity and consistency of coverage of targeted regions.

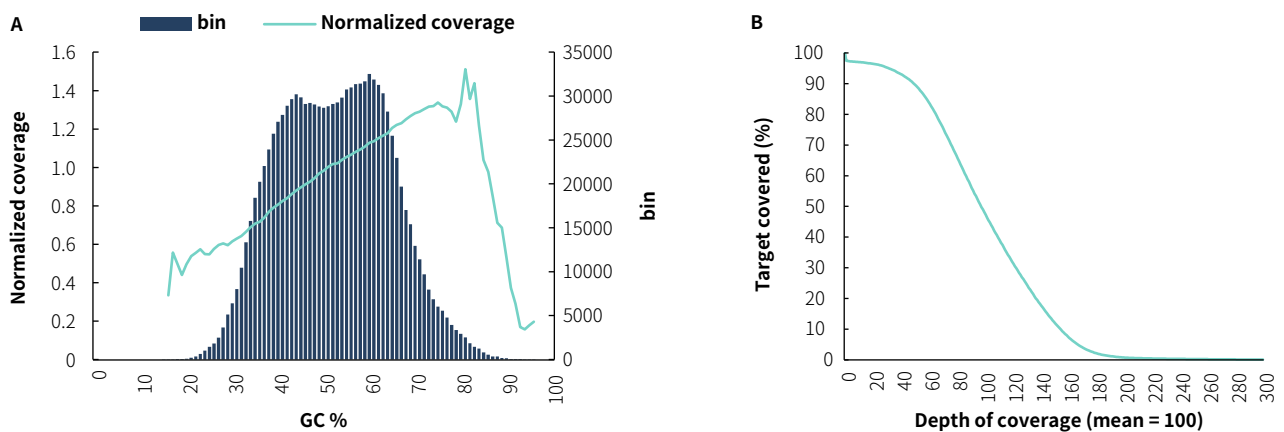


Figure 5. Capture performance of RNACap panel. The library for human male genomic DNA (Promega, G1471) samples was constructed using the LeXPrep DNA Library Preparation Kit (for Illumina®). The customized 500-gene RNACap panel was used to complete hybridization capture. Sequencing platform: Illumina NovaSeq 6000, PE 150. **A.** Coverage of regions with different GC content; **B.** Uniformity of coverage of targeted regions.

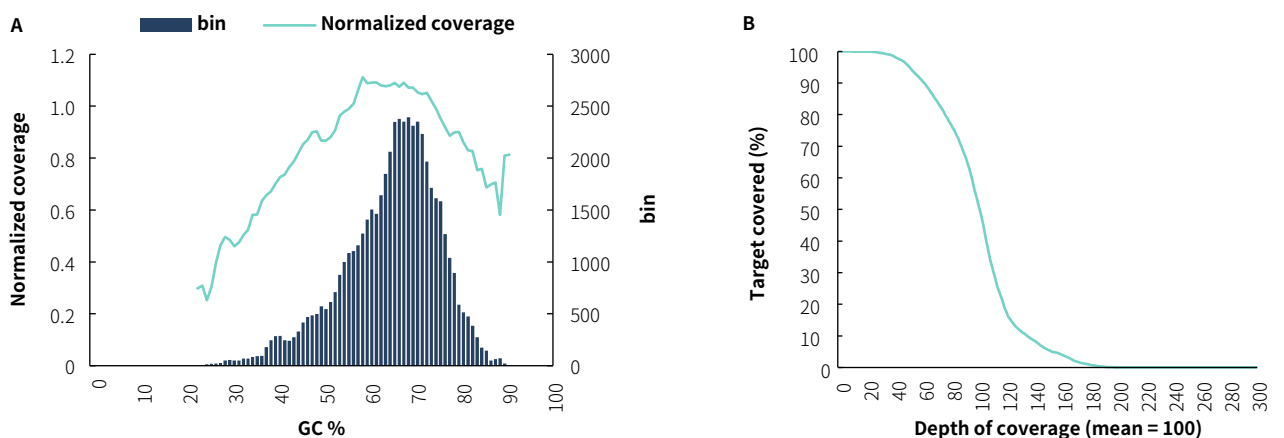


Figure 6. Capture performance of MethylCap panel. The library for Human male genomic DNA (Promega, G1471) samples after being transformed by the bisulfite method was constructed using the LeXPrep DNA Library Preparation Kit (for Illumina®). A customized 50 Kb MethylCap panel was used to complete hybridization capture. Sequencing platform: Illumina NovaSeq 6000, PE 150. **A.** Coverage of regions with different GC content; **B.** Uniformity of coverage of targeted regions.

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