Multi-cancer Early Methylation for Screening | LeXso EMS Panel v1.0

Background

The research report "Global cancer burden growing, amidst mounting need for services" released by the International Agency for Research on Cancer (IARC) of the World Health Organization (WHO), shows that in 2022, there were 20 million new cancer cases and 9.7 million cancer deaths worldwide, with lung cancer being the most common new case and cause of death globally. It is estimated that by 2050, the global incidence of new cancer cases will exceed 35 million, representing a staggering 77% increase compared to 2022. The emergence of multi-cancer early screening has epoch-making significance for the development of cancer screening and diagnosis. Compared to single-cancer detection, multi-cancer detection can achieve simultaneous detection of multiple cancers (including several cancers for which screening methods are not yet recommended), making it an inevitable trend for the future of the industry. With the development of the cancer early screening industry and the expansion of market, an increasing number of companies are now entering the multi-cancer early detection market, transitioning from single-cancer to multi-cancer detection. Therefore, LexigenBio has launched the **LeXso EMS Panel v1.0**, with integrates the latest upgrades of LeXso Hybrid Capture Reagents v2 and LeXso Blockers. Based on the new LeXso Methylation Hybrid Capture System, which can capture and convert methylated libraries, covering the methylation status targets of candidate genes for target cancer species within the test samples.

Introduction

LeXso EMS Panel v1.0 (Early Methylation for Screening) covers methylation gene sites related to nine major high-incidence cancers, including selected sites approved by the NMPA and FDA, as well as those reported in literature and patents. It encompasses nine types of cancers, including lung cancer, colorectal cancer, gastric cancer, liver cancer, breast cancer, carcinoma cancer, prostate cancer, cervical cancer, and ovarian cancer, involving 76 methylated candidate genes associated with carcinogenesis and tumor suppression, with over 2,000 CpG sites. The probe design covers approximately 20 Kb of the human genome, providing comprehensive and accurate support for methylation early screening.
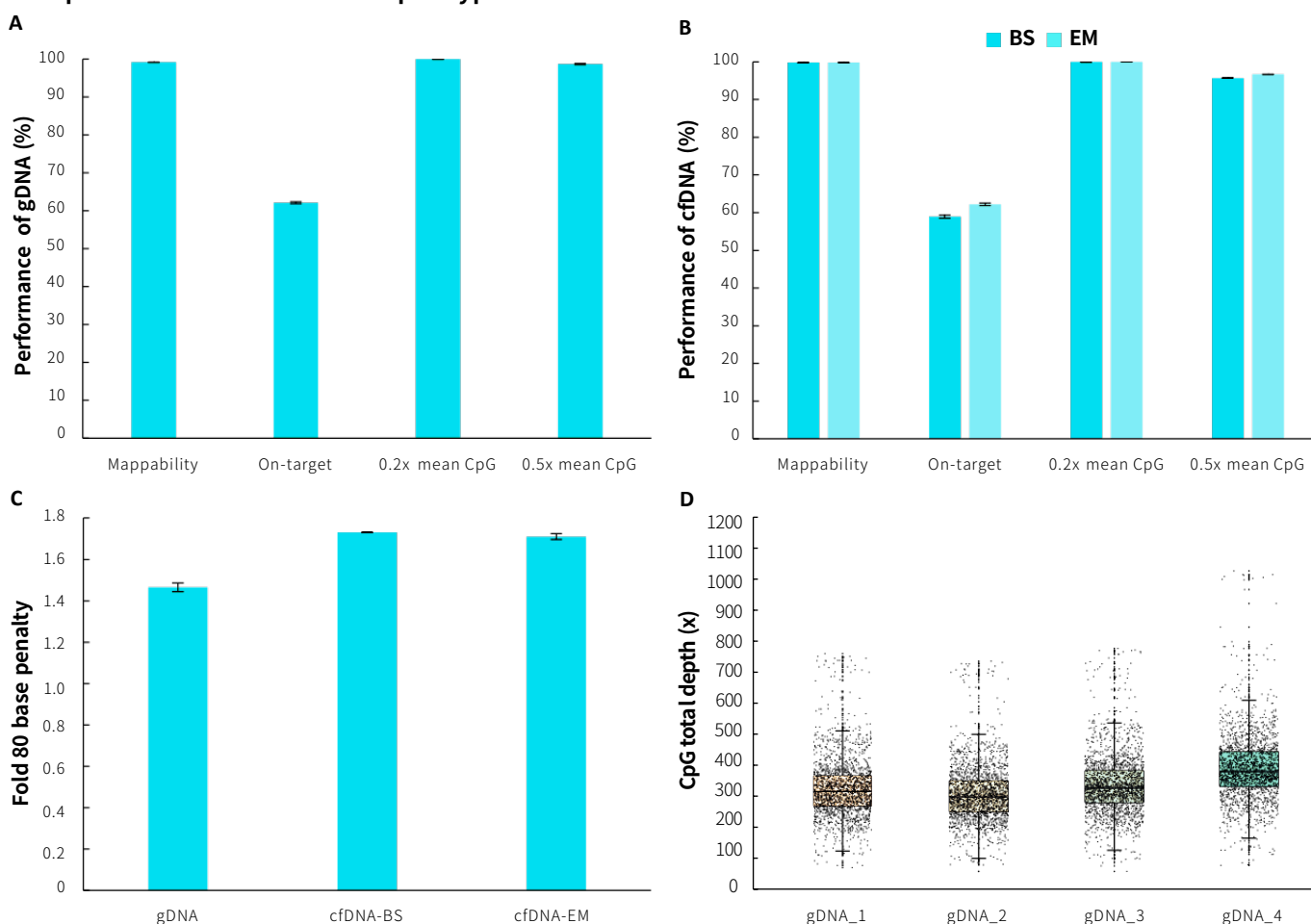
Species of Cancer	Biomarker
Lung Cancer	SCT、HOXA7、RASSF1、SHOX2、PTGER4
Colorectal Carcinoma	NDRG4、BCAT1、Septin9、BMP3、TFPI2、SDC2、SFRP2
Gastric Cancer	Septin9、RNF180、TCF4、RPRM、SDC2、TERT
Liver Cancer	SCN4B、BDH1、HOXA10、PLAC8、BMPR1A、TEPP、SPACA6、MIXL1、TSC22D1
Breast Cancer	CDO1、PITX2、GSTP1、GP5、APC
Carcinoma Cancer	SOX1、GALR1、DMRTA2、EVX2、SOX17、DCHS2、TWIST1、TBX5、HOXA11、SIM2、LHX2
Prostatic Cancer	CCND2、CDH1、MCAM、PENK、PITX2、PTGS2、RARB、LINC02028、SLCO3A1、HES5、TPM4、FHAD1、SOX1-OT、IGFBP3、ZNF154、FEZF2、APC
Cervical Cancer	SOX1、PAX1、JAM3、TAFA4、ASTN1、DLX1、ITGA4、RXFP3、SOX17
Ovarian Cancer	PCDHB18P、CDO1、HOXA9、LYPD5、CDH13、FOXD3、ZNF671、HOXA11、FBXO32、OPCML、BLACAT1、LRRC41、GNE、FAIM2、CAPN2、SIM2

Product Features

- **Multi-Cancer Detection:** Covers CpG sites of multiple genes for 9 major cancer types in a single detection.
- **Sample Compatibility:** Suitable for gDNA, cfDNA, and various level of FFPE samples.
- **Accurate Quantification:** Achieves precise quantification of methylation levels in tested samples.
- **Efficient Capture:** Combines with LeXso Total Solution for Methylation to ensure uniform data quality, higher capture efficiency and stability.
- **High Reliability:** Utilizes exclusive patented probe design to comprehensively detect methylation status, providing reliable results.
- **Stable Delivery:** In-house nucleic acid synthesis manufacturing ensures on-hand delivery and guarantees the stability of the delivery chain.
- **Flexible Customization:** Customizes panels containing different genes and scales of CpG sites for testing specific single/multiple cancer types.
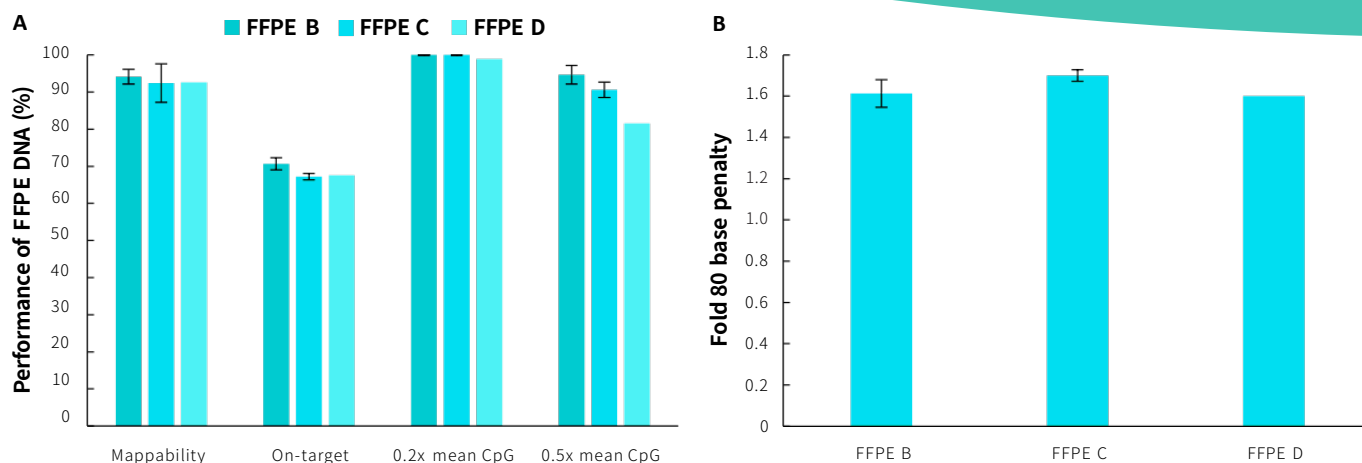
Performance

Compatible with Different Sample Types

Figure 1. Capture performance of LeXso EMS Panel v1.0 applied to gDNA and cfDNA samples. A. gDNA; **B.** cfDNA; **C.** Fold 80 base penalty; **D.** CpG total depth of target regions (deduplicated). Samples were used to prepare pre-library using the LeXPrep Methyl Library Preparation Module, with gDNA undergoing conversion using LeXPrep DNA Methyl Bisulfite Conversion Module (BS), and cfDNA undergoing conversion using both BS and enzymatic (EM) methods. 500 ng/pre-library was inputted, and hybrid capture was performed using LeXso Hybrid Capture Reagents v2 and LeXso EMS Panel v1.0.

Note: gDNA samples refer to Human Genomic DNA standard (Promega, G1471), with an input of 50 ng; cfDNA samples refer to plasma cfDNA, with an input of 20 ng.

Figure 2. Capture performance of LeXso EMS Panel v1.0 applied to different grades of FFPE samples. A. Capture performance; **B.** Fold 80 base penalty.
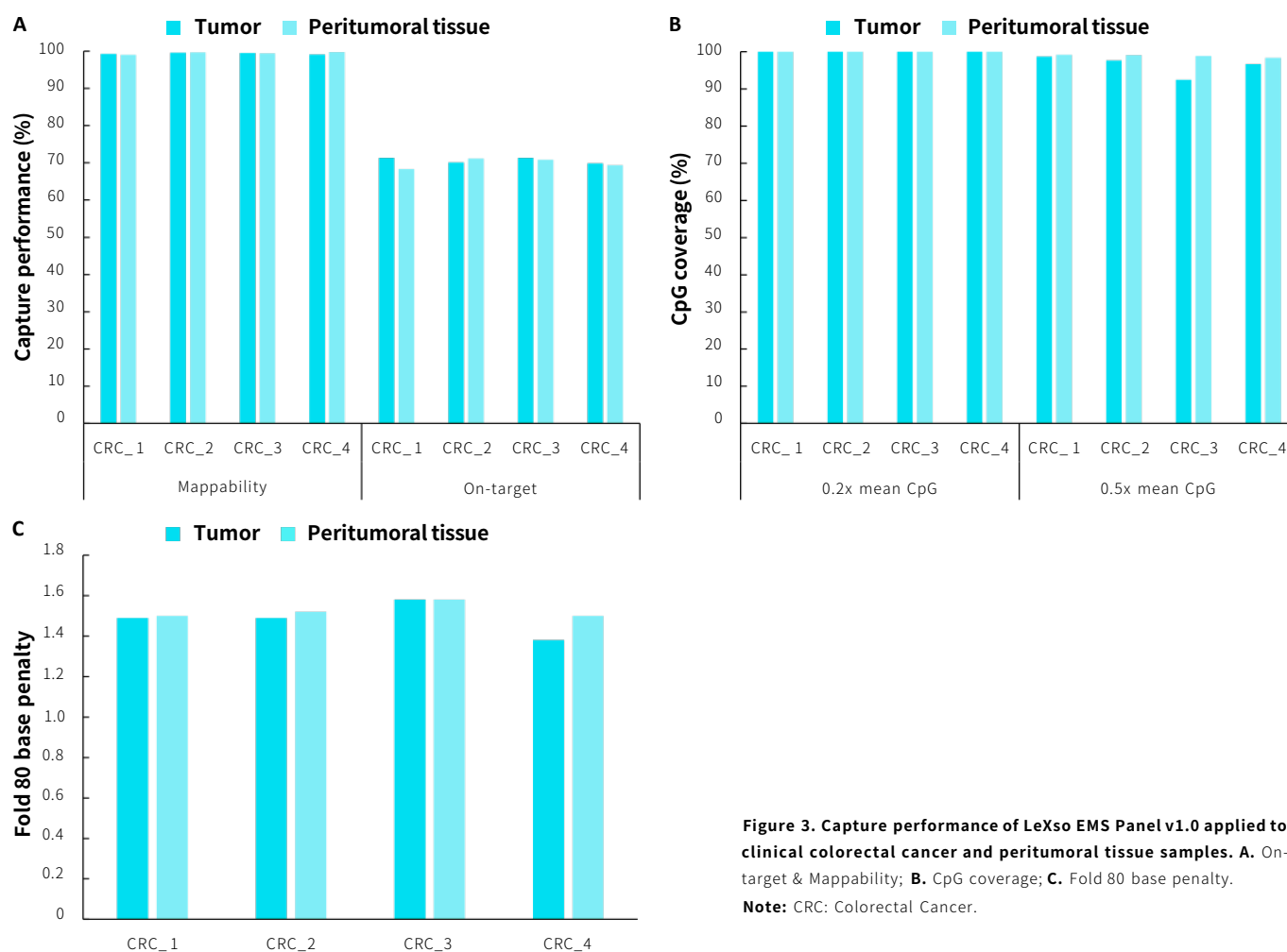Pre-library were prepared using the LeXPrep Methyl Library Preparation Module, followed by conversion using the LeXPrep DNA Methyl Bisulfite Conversion Module.
500 ng of pre-library was inputted, and hybrid capture was performed using LeXso Hybrid Capture Reagents v2 and LeXso EMS Panel v1.0.
Note: FFPE samples were clinical lung cancer samples, input 50 ng. Sample grading criteria: FFPE B: Main bands around 15 Kb with moderate smearing; FFPE C: Bands primarily distributed between 200-2500 bp, appearing diffuse; FFPE D: Bands mainly distributed between 100-1000 bp, appearing diffuse.
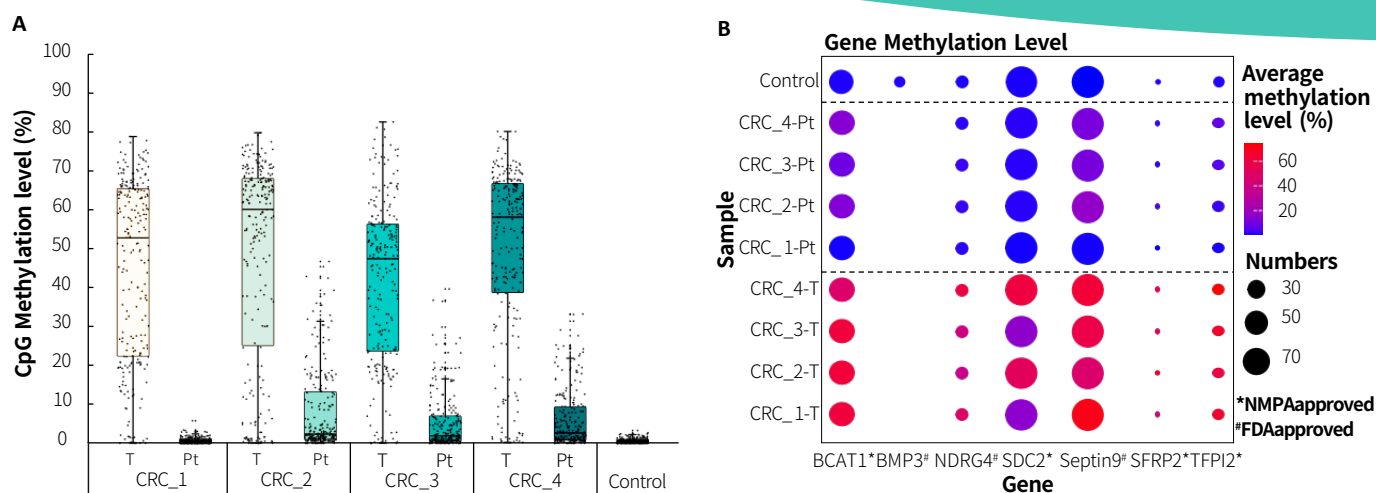
Clinical Sample Detection Performance

Colorectal Cancer

Figure 3. Capture performance of LeXso EMS Panel v1.0 applied to clinical colorectal cancer and peritumoral tissue samples. A. On-target & Mappability; **B.** CpG coverage; **C.** Fold 80 base penalty.
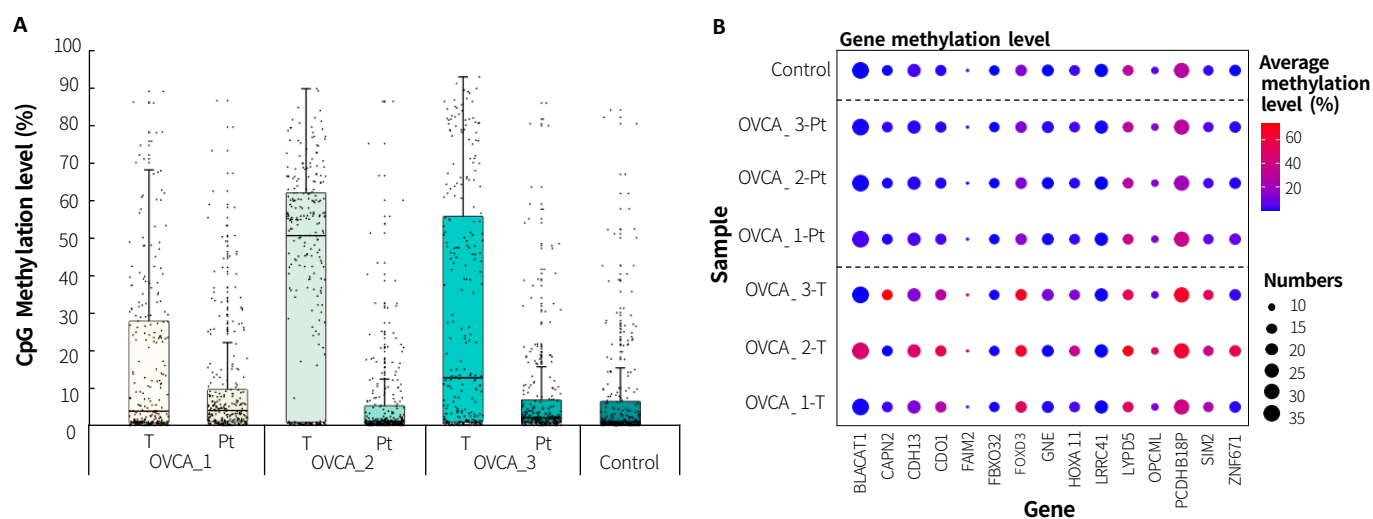**Note:** CRC: Colorectal Cancer.

Figure 4. Methylation level detection of LeXso EMS Panel v1.0 applied to clinical colorectal cancer and peritumoral tissue samples. A. CpG methylation level in paired colorectal cancer samples; **B.** CpG methylation level of colorectal cancer candidate biomarkers in clinical samples.

Note: CRC: Colorectal Cancer; Pt: Peritumoral tissue.
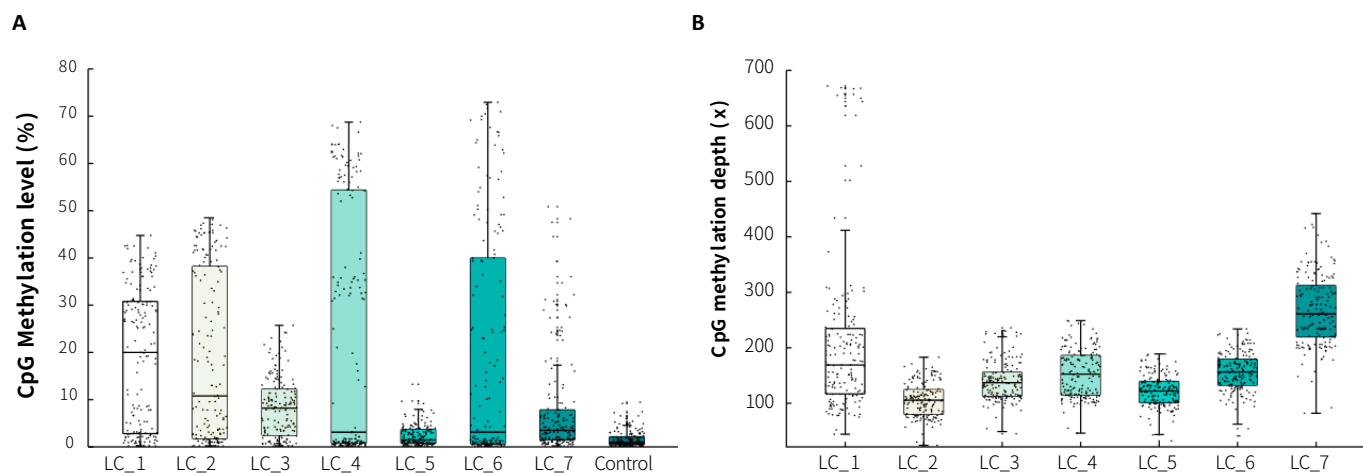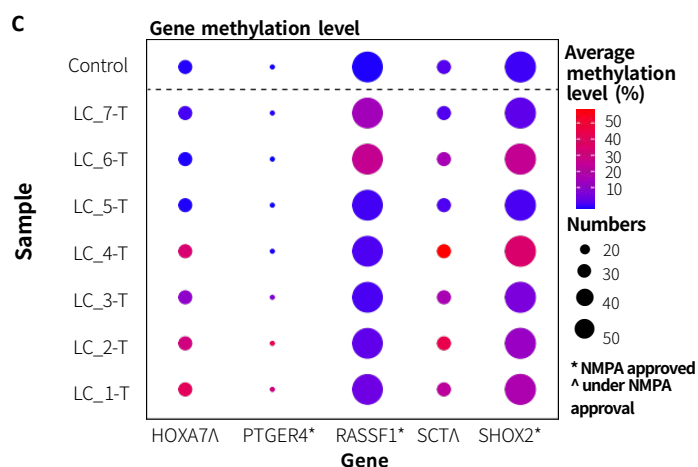
Ovarian Cancer

Figure 5. The methylation level detection of LeXso EMS Panel v1.0 applied to clinical ovarian cancer and peritumoral tissue. A. CpG methylation level in paired ovarian cancer samples; **B.** CpG methylation level of ovarian cancer candidate biomarkers in clinical samples.

Note: OVCA: Ovarian Cancer; Pt: Peritumoral tissue.

Lung Cancer

C

Gene methylation level

Figure 6. The methylation level detection of LeXso EMS Panel v1.0 applied to clinical lung cancer tissue. A. CpG methylation level in lung cancer samples; **B.** CpG depth in lung cancer samples; **C.** CpG methylation level of lung cancer candidate biomarkers in clinical samples. **Note:** LC: Lung Cancer.

Ordering Information

Product	Catalog#
LeXso EMS Panel v1.0, 96 rxn	LX11501
LeXso EMS Panel v1.0, 16 rxn	LX11502

Statement

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