

QIAseq Multimodal Panels

Human Lung Cancer

Cat. nos. 333932 UHS-005Z-12 and 333935 UHS-005Z-96

For consolidated targeted next-generation sequencing of DNA and RNA

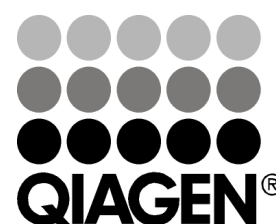
The QIAseq Multimodal Human Lung Cancer Panel permits the sequencing the whole coding region of 72 genes frequently mutated in lung cancer as well as the detection of fusions to 65 genes also frequently observed in lung cancer samples, with 4,149 and 487 primers respectively. Such frequently detected mutations and fusions are likely to be relevant or even important to lung cancer biology and may be used in translational research to classify samples with known phenotypes. Using the Catalogue of Somatic Mutations in Cancer (COSMIC), frequently mutated genes and frequently detected fusions were collected for non small cell lung cancers (NSCLC), small cell lung cancers, squamous cell carcinomas (SCC), various adenocarcinomas and other carcinomas of the lung. From the same cancer subtypes, additional fusions were also collected from the Archer Quiver Database, and more mutations and more fusions were both requested and suggested by QIAGEN KOLs and SMEs and found in other peer-reviewed publications. Using digital DNA sequencing, SNP/indels in, and fusions to, two different focused panels of genes relevant to lung cancer can be detected with this primer pool.

For further details, consult the *QIAseq Multimodal Panels Handbook*.

Shipping and storage

QIAseq Multimodal Panels (except QIAseq Beads, QIAseq Bead Binding Buffer, and Nuclease-free Water) are shipped on dry ice and should be stored immediately upon receipt at -30°C to -15°C in a constant-temperature freezer. QIAseq Beads, QIAseq Bead Binding Buffer, and Nuclease-free Water are shipped in a separate box on cold packs. Upon receipt, QIAseq Beads, QIAseq Bead Binding Buffer, and Nuclease-free Water should be stored at $2-8^{\circ}\text{C}$. QIAseq Multimodal Index kits are shipped on dry ice and should be stored at -30°C to -15°C upon arrival.

Note: Open the package and store the products appropriately immediately upon receipt.



Panel Contents

QIAseq Multimodal Panel Catalog Number	333932	333935
Number of samples	12	96
Multimodal DHS Panel (DNA)	120 µL	960 µL
Multimodal VHS Panel (RNA)	96 µL	768 µL
Fragmentation Buffer, 10x	40 µL	192 µL
Fragmentation Enzyme Mix	90 µL	384 µL
FERA Solution	15 µL	60 µL
Side Reaction Reducer	48 µL	192 µL
FG Solution	170 µL	170 µL
DNA Ligase	75 µL	600 µL
Ligation Solution	125 µL	970 µL
Ligation Buffer, 5x	160 µL	1250 µL
DNA Ligation Adapter	34 µL	270 µL
ATP Solution	36 µL	290 µL
PAP Enzyme	12 µL	96 µL
PAP Dilution Buffer, 10x	24 µL	192 µL
T4 Polynucleotide Kinase	12 µL	125 µL
EZ Reverse Transcriptase	15 µL	150 µL
RNase Inhibitor	12 µL	96 µL
Multimodal RT Primer	12 µL	96 µL
Multimodal RT Buffer, 5x	60 µL	480 µL
Multimodal RT Enhancer	12 µL	48 µL
TEPCR Buffer, 5x	60 µL × 2	500 µL × 2
HotStarTaq® DNA Polymerase (6 U/µL)	60 µL	480 µL
Nuclease-free Water	1 tube	10 mL
QIAseq Beads	10 mL	38.4 mL × 2
QIAseq Bead Binding Buffer	10.2 mL	10.2 mL × 2

Gene Table: DNA SNP/indel

Gene Symbol	Gene Symbol	Gene Symbol	Gene Symbol
ADGRB3	AKT1	ALK	AMER1
APC	ARID1A	ATM	BAP1
BRAF	CDKN2A	CDKN2B	CREBBP
CTNNB1	DDR2	EGFR	EPHA5
ERBB2	ERBB4	FBXO7	FBXW7
FGFR1	FGFR2	FGFR3	FHIT
GRM8	HRAS	JAK2	KDR
KEAP1	KIT	KMT2D	KRAS
LRP1B	MAP2K1	MDM2	MET
MGA	MLH1	MUC16	MYC
NF1	NFE2L2	NOTCH1	NRAS
NTRK1	NTRK2	NTRK3	PDGFRA
PIK3CA	PIK3CG	PIK3R1	PIK3R2
PKHD1	PTEN	PTPRD	RARB
RASSF1	RB1	RBM10	RET
RIT1	ROS1	RUNX1T1	SETD2
SMAD4	SMARCA4	SOX2	STK11
TNFAIP3	TP53	TSC1	U2AF1

Gene Table: RNA Fusions

Gene Symbol	Gene Symbol	Gene Symbol	Gene Symbol
ALK	ARL17A	BAG4	BAIAP2L1
BCL11A	BRAF	BRD4	CCDC6
CD74	CLIP4	CRTC1	CUX1
DNAH5	EGFR	EML4	ETV6
EZR	FER	FGFR1	FGFR2
FGFR3	GCC2	GLRX5	GOPC
HIP1	HLA-DRB1	IRF2BP2	KANS11
KIAA1217	KIF5B	KLC1	LRIG3
MAML2	MAN2A1	MET	MPRIP
NCOA4	NRG1	NTRK1	NTRK2
NTRK3	NUTM1	PBX1	PTPRK
RAD51	RET	ROS1	RSPO3
RUNX1	SDC4	SLC34A2	SLC3A2
SND1	SQSTM1	STARD3NL	STRN
TACC3	TCF3	TFG	TPM3
TPR	TRA2B	TRIM33	VSNL1
WHSC1L1			

Functional Groupings

DNA SNP/INDELS:

Non Small Cell Lung Cancers (NSCLC): ADGRB3, ALK, AMER1, APC, ATM, BRAF, CDKN2A, CTNNB1, EGFR, ERBB2, FGFR3, GRM8, HRAS, JAK2, KRAS, MET, MUC16, NF1, NFE2L2, NRAS, NTRK2, NTRK3, PDGFRA, PIK3CA, PIK3CG, PKHD1, PTEN, RB1, RET, SMARCA4, STK11, TNFAIP3, TP53.

Small Cell Lung Cancers: ADGRB3, ALK, AMER1, ARID1A, ATM, CDKN2A, CREBBP, CTNNB1, DDR2, EGFR, EPHA5, ERBB4, FBXO7, FBXW7, FGFR1, FHIT, GRM8, HRAS, KDR, KIT, KMT2D, KRAS, LRP1B, MET, MUC16, MYC, NF1, NOTCH1, NTRK1, NTRK2, NTRK3, PIK3CA, PIK3CG, PIK3R1, PKHD1, PTEN, PTPRD, RARB, RB1, RBM10, RET, RIT1, ROS1, RUNX1T1, SETD2, SMARCA4, TNFAIP3, TP53.

Carcinomas:

Acinar Adenocarcinomas: BRAF, EGFR, KRAS.

Adenocarcinomas: ADGRB3, AKT1, ALK, AMER1, APC, ARID1A, ATM, BAP1, BRAF, CDKN2A, CDKN2B, CREBBP, CTNNB1, DDR2, EGFR, EPHA5, ERBB2, ERBB4, FBXO7, FBXW7, FGFR1, FGFR2, FGFR3, FHIT, GRM8, HRAS, JAK2, KDR, KEAP1, KIT, KMT2D, KRAS, LRP1B, MAP2K1, MDM2, MET, MGA, MLH1, MUC16, MYC, NF1, NFE2L2, NOTCH1, NRAS, NTRK1, NTRK2, NTRK3, PDGFRA, PIK3CA, PIK3CG, PIK3R1, PIK3R2, PKHD1, PTEN, PTPRD, RARB, RASSF1, RB1, RBM10, RET, RIT1, ROS1, RUNX1T1, SETD2, SMAD4, SMARCA4, SOX2, STK11, TNFAIP3, TP53, TSC1, U2AF1.

Bronchioalveolar Adenocarcinomas: CDKN2A, EGFR, ERBB2, KRAS, NF1, STK11, TP53.

Giant Cell Carcinomas: EGFR.

Large Cell Carcinomas: BRAF, CDKN2A, DDR2, EGFR, EPHA5, FGFR1, FGFR3, HRAS, KEAP1, KRAS, NRAS, NTRK1, NTRK3, PIK3CA, STK11, TP53.

Lymphoepithelioma-Like Carcinomas: EGFR, TP53.

Micropapillary Adenocarcinomas: BRAF, EGFR, KRAS.

Mixed Adenosquamous Carcinomas: EGFR, KRAS, PIK3CA, STK11, TP53.

Mixed Small Cell Carcinomas-Adenocarcinomas: CREBBP, DDR2, EGFR, TP53.

Mucoepidermoid Carcinomas: EGFR.

Oncocytic Adenocarcinomas: EGFR, KRAS.

Pleomorphic Carcinomas: EGFR, KIT, KRAS, TP53.

Sarcomatoid Carcinomas: EGFR, KRAS.

Squamous Cell Carcinomas (SCC): ADGRB3, AKT1, ALK, AMER1, APC, ARID1A, ATM, BRAF, CDKN2A, CDKN2B, CREBBP, CTNNB1, DDR2, EGFR, EPHA5, ERBB2, ERBB4, FBXO7, FBXW7, FGFR1, FGFR2, FGFR3, FHIT, GRM8, HRAS, JAK2, KDR, KEAP1, KIT, KMT2D, KRAS, LRP1B, MAP2K1, MDM2, MET, MGA, MLH1, MUC16, MYC, NF1, NFE2L2, NOTCH1, NRAS, NTRK1, NTRK2, NTRK3, PDGFRA, PIK3CA, PIK3CG, PIK3R1, PIK3R2, PKHD1, PTEN, PTPRD, RARB, RB1, RBM10, RET, RIT1, ROS1, RUNX1T1, SETD2, SMAD4, SMARCA4, STK11, TNFAIP3, TP53, TSC1, U2AF1.

Terminal Respiratory Unit Type Adenocarcinomas: EGFR.

Undifferentiated Carcinomas: EGFR, KRAS, MUC16, PKHD1, TP53.

Other Carcinomas: ARID1A, CTNNB1, HRAS, NRAS.

Blastomas: CTNNB1, TP53.

Carcinoid-Endocrine Tumors:

Atypical: KRAS, PIK3CA, TP53.

Typical: PIK3CA.

Carcinosarcomas: EGFR.

Other Cancer Subtypes:

Hyperplasia: EGFR, KRAS.

Mucinous Proliferation: KRAS.

Neoplasms: EGFR, KRAS.

GENE FUSIONS:

Acinar Adenocarcinomas: ALK, CD74, EML4, HIP1, KIF5B, ROS1, SDC4.

Adenocarcinomas: ALK, BAIAP2L1, BCL11A, BRAF, CCDC6, CD74, CUX1, EML4, EZR, FGFR2, FGFR3, GCC2, GOPC, HIP1, HLA-DRB1, KIAA1217, KIF5B, KLC1, LRIG3, MET, MPRIP, NCOA4, NRG1, NTRK1, NTRK2, PBX1, RET, ROS1, SDC4, SLC34A2, SND1, STARD3NL, STRN, TACC3, TCF3, TFG, TPM3, TPR, TRIM33.

Bronchioloalveolar Adenocarcinomas: ALK, EML4, KLC1, PBX1, ROS1, SDC4, TCF3.

Inflammatory Myofibroblastic Tumors: ALK, CD74, EML4, EZR, GOPC, LRIG3, ROS1, SDC4, SLC34A2, TPM3.

Invasive Mucinous Adenocarcinomas: ALK, CD74, EML4, NRG1, SLC3A2.

Mixed Adenosquamous Carcinomas: ALK, EML4, KIF5B, RET.

Mucoepidermoid Carcinomas: ALK, CRTCL1, EML4, MAML2.

Non-Small Cell Carcinomas: ALK, BCL11A, CCDC6, CD74, CUX1, EGFR, EML4, EZR, GCC2, GOPC, HIP1, KIAA1217, KIF5B, KLC1, LRIG3, NCOA4, RET, ROS1, SDC4, SLC34A2, STRN, TFG, TPM3, TPR, TRIM33.

Non-Small Cell Lung Cancers (NSCLC): ALK, BAG4, BAIAP2L1, BCL11A, CCDC6, CD74, CLIP4, CUX1, DNAH5, EGFR, EML4, ETV6, EZR, FER, FGFR1, FGFR3, GCC2, GLRX5, GOPC, HIP1, HLA-DRB1, IRF2BP2, KIAA1217, KIF5B, KLC1, LRIG3, MAN2A1, MET, MPRIP, NCOA4, NRG1, NTRK1, NTRK3, RAD51, RET, ROS1, RUNX1, SDC4, SLC34A2, SLC3A2, SQSTM1, STRN, TACC3, TFG, TPM3, TPR, TRA2B, TRIM33, VSNL1.

Squamous Cell Carcinomas (SCC): ALK, BAIAP2L1, CD74, EML4, FGFR2, FGFR3, HIP1, KIF5B, NRG1, RET, TACC3.

Other Carcinomas: ALK, BRD4, EML4, NUTM1.

Other Lung Cancers: ARL17A, BAG4, BAIAP2L1, CCDC6, CD74, CUX1, EZR, FGFR1, FGFR3, GOPC, IRF2BP2, KANSL1, KIAA1217, KIF5B, LRIG3, MPRIP, NCOA4, NRG1, NTRK1, NUTM1, PTPRK, RET, ROS1, RSPO3, SDC4, SLC34A2, SLC3A2, SQSTM1, TACC3, TPM3, TPR, TRIM33, WHSC1L1.

Ordering Information

Product	Contents	Cat. no.
QIAseq Multimodal Panel (12)	Kit containing all reagents (except indexes) for multimodal (DNA and RNA) sequencing; fixed small panel for a total of 12 samples: 12 DNA and 12 RNA libraries	333932
QIAseq Multimodal Panel (96)	Kit containing all reagents (except indexes) for multimodal (DNA and RNA)	333935
QIAseq Multimodal HC Panel (12)	Kit containing all reagents (except indexes) for multimodal (DNA and RNA) sequencing; fixed high content (HC) panel for a total of 12 samples: 12 DNA and 12 RNA libraries	333942
QIAseq Multimodal HC Panel (96)	Kit containing all reagents (except indexes) for multimodal (DNA and RNA) sequencing; fixed high content (HC) panel for a total of 96 samples: 96 DNA and 96 RNA libraries	333945
QIAseq Multimodal Custom Panel (96)	Kit containing all reagents (except indexes) for multimodal (DNA and RNA) sequencing; custom panel for a total of 96 samples: 96 DNA and 96 RNA libraries	333955
QIAseq Multimodal Index I SW (12)	Box containing oligos, enough to process a total of 12 samples, for indexing up to a	333982
QIAseq Multimodal HT SW 96 UDI	Box containing oligos, enough to process a total of 96 samples, for indexing up to a total of 96 samples (96 for DNA and 96 for RNA) for multimodal panel sequencing on Illumina platforms. Note: For Separated Enrichment Workflow (SW) for Targeted Enrichment	333986
QIAseq Multimodal Index I (12)	Box containing oligos, enough to process a total of 12 samples, for indexing up to a total of 12 samples (12 for DNA and 12 for RNA libraries) for multimodal panel sequencing on Illumina platforms. Note: For Combined Enrichment Workflow (CW) for Targeted Enrichment	333962
QIAseq Multimodal HT CW 96 UDI	Box containing oligos, enough to process a total of 96 samples, for indexing up to a	333979
Related products		
QIAseq DNA QuantiMIZE Assay Kit	qPCR assays for optimizing amount of input DNA and PCR cycling conditions for targeted enrichment of FFPE DNA	333414
QIAamp® DNA Mini Kit (50)	For 50 DNA preps: 50 QIAamp Mini Spin Columns, QIAGEN Proteinase K, collection tubes (2 mL), reagents and buffers	51304

Product	Contents	Cat. no.
QIAamp Circulating Nucleic Acid Kit (50)	For 50 DNA preps: QIAamp Mini Columns, Tube Extenders (20 mL), QIAGEN Proteinase K, carrier RNA, buffers, VacConnectors, and collection tubes (1.5 mL and 2 mL)	55114
AllPrep DNA/RNA Mini Kit (50)	For 50 minipreps: AllPrep DNA Spin Columns, RNeasy Mini Spin Columns, collection tubes, RNase-free water, and buffers	80204
AllPrep DNA/RNA FFPE Kit (50)	50 RNeasy MinElute Spin Columns, 50 QIAamp MinElute Spin Columns, collection tubes, RNase-free reagents, and buffers	80234
PAXgene Blood DNA Kit (25)	Processing tubes and buffers for 25 preparations	761133
PAXgene Blood RNA Kit (50)	50 PAXgene Spin Columns, 50 PAXgene Shredder Spin Columns, processing tubes, RNase-Free DNase I, RNase-free reagents and buffers	Inquire

QIAseq Multimodal Panels are intended for molecular biology applications. These products are not intended for the diagnosis, prevention or treatment of a disease.

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