General Cancer Panels for Clinical Next Generation Sequencing (NGS) Testing

GENOME EXPLORATIONS
A DIVISION OF COMPASS LABORATORY SERVICES LLC

GenOnc Cancer Panel 3 - Cancer Hotspots

Introduction

GenOnc Cancer Panel 3 expands the cancer gene repertoire covered in GenOnc Cancer Panels 1 and 2 by targeting genomic "hot spot" regions in 50 human oncogenes and tumor suppressor genes, detecting 2,800 COSMIC mutations frequently found in a variety of human cancers.

GenOnc Cancer Panel 3 Genes

ABL1, EZH2, JAK3, PTEN, AKT1, FBXW7, IDH2, PTPN11,ALK, FGFR1, KDR, RB1, APC, FGFR2, KIT, RET, ATM, FGFR3, KRAS, SMAD4, BRAF, FLT3, MET, SMARCB1, CDH1, GNA11, MLH1, SMO, CDKN2A, GNAS, MPL, SRC, CSF1R, GNAQ, NOTCH1, STK11, CTNNB1, HNF1A, NPM1, TP53, EGFR, HRAS, NRAS, VHL, ERBB2, IDH1, PDGFRA, ERBB4, JAK2, PIK3CA

GenOnc Cancer Panel 4 - Comprehensive

Introduction

GenOnc Cancer Panel 4 - Comprehensive is a collection of multiplexed PCR primer assays for targeted enrichment of the coding (exonic) regions of the 160 genes that are most commonly mutated in cancers with a recognizable oncogenic consequence. Mutations in these oncogenes and tumor suppressor genes are often relevant for tumor classification, and warrant extensive investigation to enhance the understanding of carcinogenesis. Cancer research continually identifies novel mutated carcinogenesis-related genes, or novel mutations in known oncogenic genes, elucidating new mechanisms of cancer progression or treatment evasion. A tumor's genome may become unstable during tumor progression, increasing the likelihood of additional mutations. Therefore, each tumor may have rare mutations that would not be identified in a smaller gene panel. A larger gene panel, including the commonly mutated genes in several tumor types, increases the chances of identifying the major mutations in each tumor, potentially identifying novel molecular mechanisms. This panel includes functionally important oncogenic genes from the Cancer Gene Census, as well as the most relevant genes from our 8 individual cancer panels. This panel allows researchers to identify all known and novel mutations in exons of critical cancer-related genes.

GenOnc Cancer Panel 4 Genes

Oncogenes:
AR, CDK4, H3F3A, HIST1H3B, JAK1, JAK2, KIT (CD117), MAP2K1 (MEK1), MED12, MET, NFE2L2, NRAS, PIK3CA (p110α), SF3B1, SPOP, SRC, SRSF2, U2AF1

Tumor Suppressor Genes:
ARID2, ATM, ATRX, BAP1, BCOR, BRCA1, BRCA2, CDH1, CIC, DAXX, FUBP1, GATA3, MAP3K1 (MEKK1), MEN1, MLH1, MLL2, NF1, NF2, PBRM1, PHF6, PRDM1, SMAD4, STK11, TSC1, VHL, WT1

Signal Transduction:
Fibroblast Growth Factor: AKT1, FGFR2, FGFR3, PIK3CA (p110α), PIK3R1 (p85α), PTEN, PTPN11, SRC
G-Protein Coupled Receptor: AKT1, ECT2L, GNA11, GNAQ, GNAS, SMO, TSHR
Hedgehog: PTCH1, SUFU
Hormone Receptors: AR, ESR1 (ERα)
MAPK: MAP2K1 (MEK1), MAP2K2 (MEK2), MAP2K4, MAP3K1 (MEKK1), MAP4K3
Notch: FBXW7, GATA2, NOTCH1, NOTCH2
PI3K/AKT/PTEN: AKT1, AKT2, CBL, ERBB2 (HER2), FLT3, JAK2, KDR (VEGFR3), KIT (CD117), NF1, PDGFRA, PIK3CA (p110α), PIK3R1 (p85α), PTEN
Receptor Tyrosine Kinases: ALK, CSF1R, DDR2, EGFR, ERBB2 (HER2), ERBB3, ERBB4, FLT3, KDR (VEGFR3), KIT, PDGFRA, RET, ROS1
WNT: APC, CCND1, CTNNB1, CYLD, FAM123B, MED12, HNF1A, PPP2R1A, TSC2
Other: KRAS, PRKAR1A, SMAD4

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Apoptosis:
ABL1, APC, BCL6, BRAF, CBL, CTNNB1, CYLD, DAXX, FAS (TNFRSF6), FLT3, FOXL2, GATA1, HRAS, MAP2K4 (JNKK1), NF1, NPM1, PTEN, RB1, STK11 (LKB1), TNFAIP3, VHL, WT1

Angiogenesis:
CTNNB1, ERBB2 (HER2), FGFR2, GATA2, KDR (VEGFR3), NF1, NOTCH1, PIK3CA (p110α), PTEN, TNFAIP3, VHL

Adhesion:
ABL1, APC, CDH1, CTNNB1, DDR2, EGFR, ERBB2 (HER2), GATA1, JAK2, KDR (VEGFR3), NF1, NF2, NOTCH1, PDGFRA, PTEN, PTPN11, RAC1, RET, SRC

Cell Cycle:
ABL1, AKT1, APC, BUB1B, CCND1, CDC73, CDK12, CDK4, CDKN2A (p16INK4), CDKN2B (p15INK4B), CHEK2 (RAD53), CREBBP, CYLD, FBXW7, FGFR2, HRAS, MYC, NPM1, PTEN, RB1, SMARCA4, SMARCB1, STK11 (LKB1), TNFAIP3, TP53

DNA Damage & Repair:
ABL1, APC, ATM, ATRX, BRCA1, BRCA2, BRIP1, CCND1, CHEK2 (RAD53), DDB2, EP300, ERCC5, FANCA, FANCD2, FANCE, MDM2, MEN1, MLH1, MSH2, MSH6, MUTYH, NPM1, PALB2, PMS2, STK11 (LKB1), TP53, XPC

Epigenetics:
ARID1A, ASXL1, ATRX, BCOR, DICER1, DNMT3A, EZH2, IKZF1, KDM6A, MLL2, PRDM1, SETD2, SMARCA4, SMARCB1, SPOP

Inflammatory Response:
CEBPA, CSF1R, IL6ST (GP130), JAK2, MYD88, TNFAIP3

Immune Response:
ALK, BTK, CARD11, CBLB, CD79A, CD79B, CREBBP, CRLF2, CYLD, EP300, FAM46C, IL7R, JAK2, JAK3, (JNKK1), MAP2K1 (MEK1), MAP2K2 (MEK2), MAP3K1 (MEKK1), MYD88, NFKBIA (IκBα/MAD3), PAX5, PIK3CA (p110α), PIK3R1 (p85α), PTEN, PTPN11, SOCS1, TNFAIP3, TNFRSF14, TP53

Hypoxia:
CREBBP, EP300, NF1, SMAD4, VHL

Metabolisim:
FH, IDH1, IDH2, MTOR, SDHB, SLC7A8

mRNA Splicing:
SF3B1, SRSF2, U2AF1, ZRSR2

Ubiquitination:
BAP1, BCOR, CBLB, DAXX, DDB2, FBXO11, MDM2

Unfolded Protein Response:
CCND1, HSPH1 (HSP105), NFE2L2, NPM1

Other Genes:
EPCAM, FLCN, GPC3, GRIN2A, KLF6, PHOX2B, TERT, ZNF2