GenOnc Ovarian Cancer Panel

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Introduction

GenOnc Ovarian Cancer Panel is a collection of multiplexed PCR primer assays for targeted enrichment of the coding (exonic) regions of the 32 genes most commonly mutated in human ovarian cancer samples. Mutations in these oncogenes and tumor suppressor genes are often relevant for tumor classification, and warrant extensive investigation to enhance the understanding of carcinogenesis. Ovarian cancer has the highest mortality rate of all gynecological cancers, partly because it is often discovered at a late stage of progression. There are many subsets of ovarian cancer; however they can all be divided into type I (low-grade) tumors or type II (high-grade) tumors. Type I tumors typically have mutations in BRAF and KRAS, whereas type II tumors commonly have mutations in TP53, BRCA1, and BRCA2, increasing genomic instability. A panel of key genes commonly mutated in ovarian cancer is an efficient way to research a tumor sample's potential carcinogenic mechanisms. This panel narrows the focus to the most relevant mutated genes in ovarian cancer, using a variety of resources such as recent whole genome/exome sequencing studies from scientific networks including the Cancer Genome Atlas. Curated databases such as the Cancer Gene Census and COSMIC (Catalogue of Somatic Mutations in Cancer) are also used.

GenOnc Ovarian Cancer Panel Genes

Carcinoma:

Adenocarcinoma: CSMD3, EGFR, NF1, PIK3CA (p110α), TP53
Carcinosarcoma-Malignant Mesodermal Mixed Tumor: CTNNB1, PIK3CA (p110α), TP53
Clear Cell Carcinoma: ARID1A, BRAF, BRCA2, CDKN2A (p16INK4), CTNNB1, KRAS, PIK3CA (p110α), PPP2R1A, PTEN, TP53
Endometrioid Carcinoma: AKT1, ARID1A, BRAF, CDKN2A (p16INK4), CTNNB1, KRAS, PIK3CA (p110α), PPP2R1A, PTEN, TP53
Mixed Adenosquamous Carcinoma: CTNNB1
Mixed Carcinoma: CTNNB1, TP53
Mucinous Carcinoma: BRAF, CDKN2A (p16INK4), ERBB2 (HER2), KRAS, PIK3CA (p110α), PPP2R1A, PTEN, TP53
Serous Adenocarcinofibroma: TP53
Serous Carcinoma: AKT1, ARID1A, BRAF, BRCA1, BRCA2, CBLC, CCNE1, CDK12, CDKN2A (p16INK4), CSMD3, CTNNB1, CUBN, EGFR, ERBB2 (HER2), FAT3, GABRA6, KIT (CD117), KRAS, MAS1L, MLH1, MSH2, NF1, NRAS, PDGFRA, PIK3CA (p110α), PIK3R1, PPP2R1A, PTEN, RB1, TP53
Serous Micropapillary Carcinoma: BRAF, KRAS
Transitional Cell Carcinoma: TP53
Undifferentiated Carcinoma: CDKN2A (p16INK4), TP53

Adenoma:

Brenner Tumor: PIK3CA (p110α)
Mucinous: CDKN2A (p16INK4), KRAS, TP53
Serous: BRAF, KRAS

Low Malignant Potential (Borderline) Tumor:

Brenner Tumor: PIK3CA (p110α)
Endometrioid: CTNNB1
Mucinous: ARID1A, BRAF, CDKN2A (p16INK4), KRAS, TP53
Serous: BRAF, ERBB2 (HER2), KRAS, PIK3CA (p110α), TP53

Germ Cell Tumor:

Dysgerminoma: KIT (CD117)
Mixed: CDKN2A (p16INK4), KIT (CD117)
Yolk Sac Tumor: CDKN2A (p16INK4)

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1

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Sex Cord-Stromal Tumor:
Fibroma-Thecoma-Fibrothecoma: FOXL2
Granulosa Cell Tumor: FOXL2, TP53

Microcystic Stromal Tumor:
CTNNB1

Neoplasm:
BRAF, CBLC, CDK12, CTNNB1, KRAS, KREMEN1, MAS1L, NF1, PIK3CA (p110α), TP53, USP16

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2