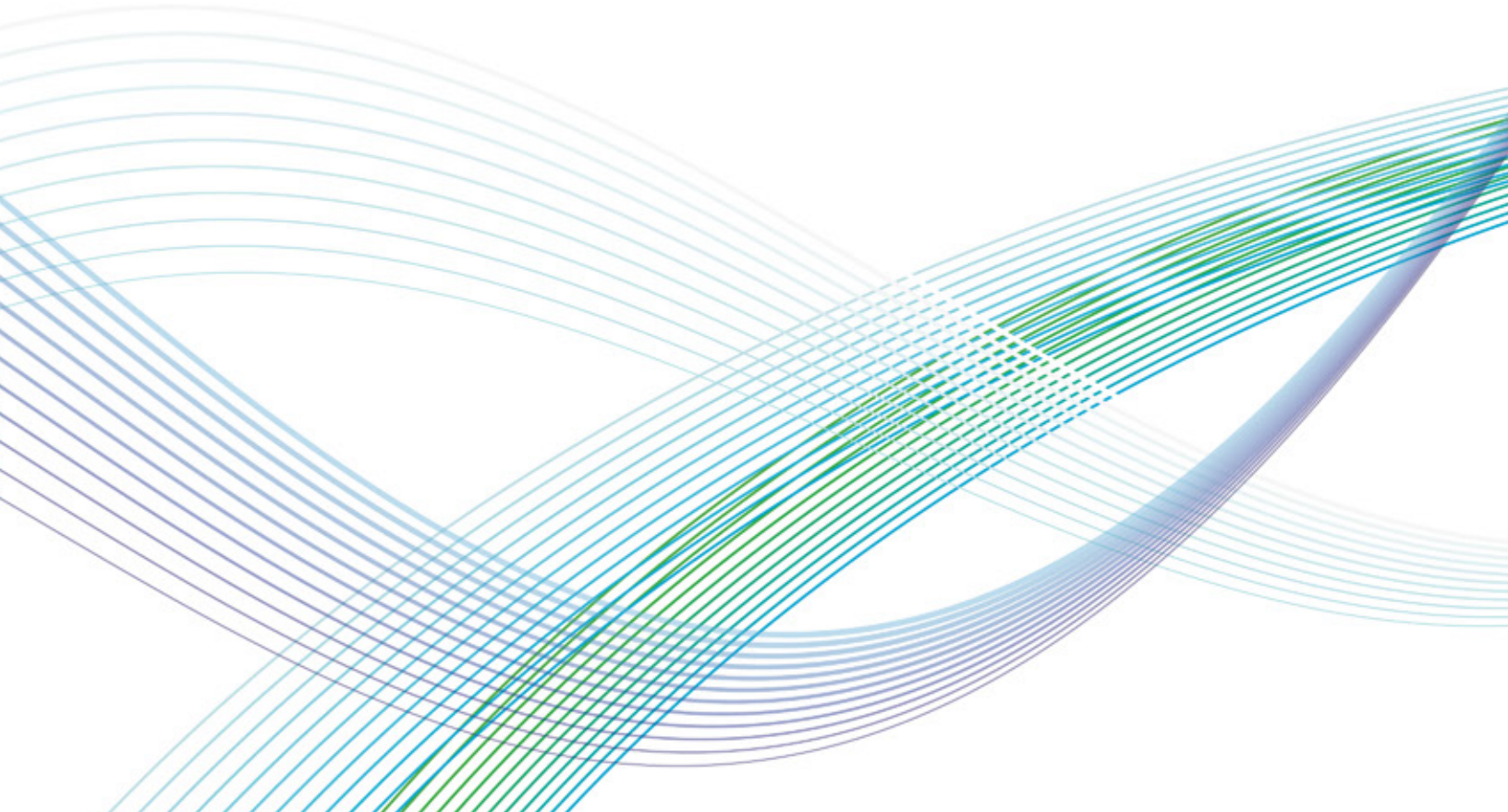
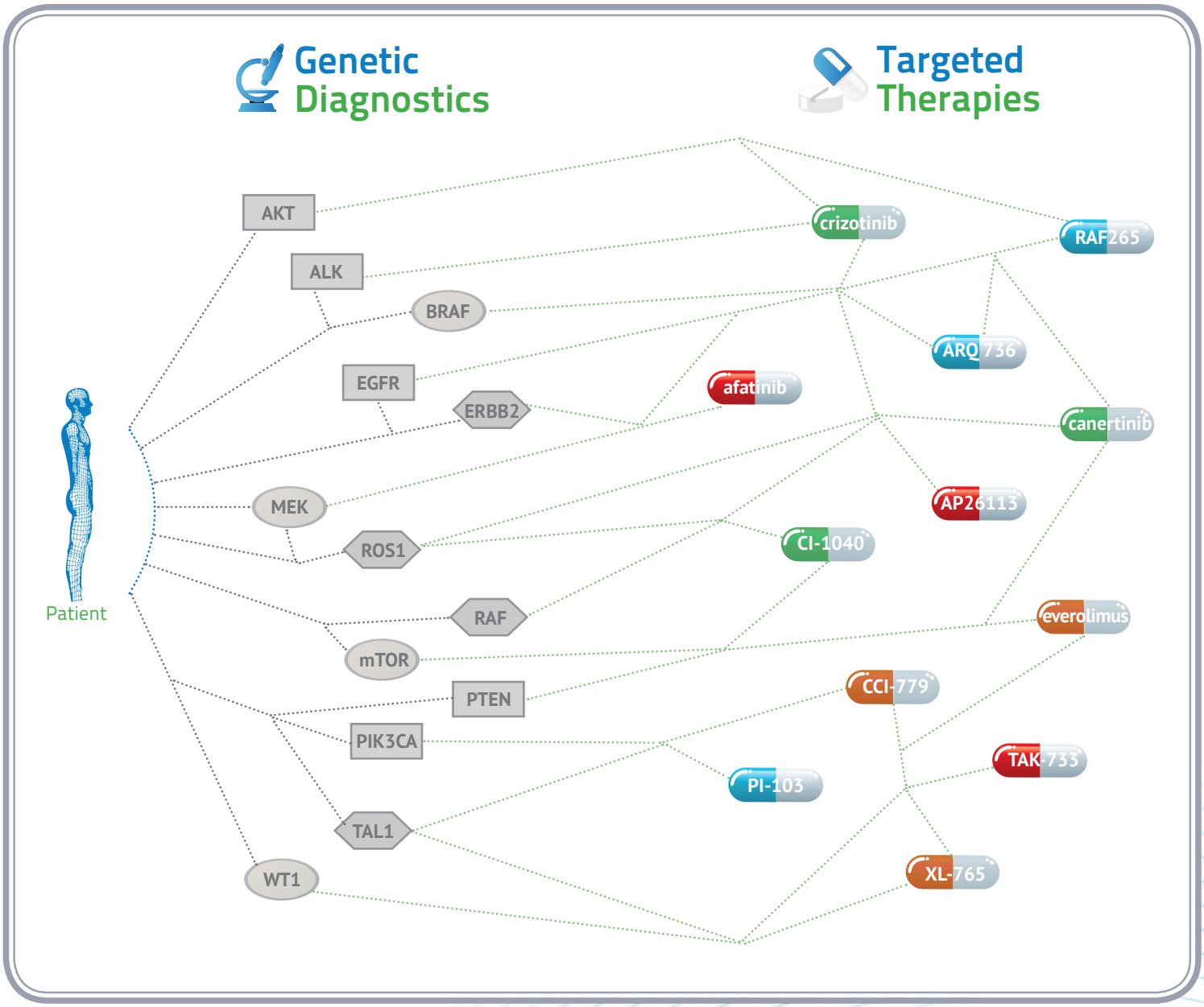
Precipio
Diagnostics

SmartGen™

Comprehensive Genetic Diagnostics



The Precision Medicine Challenge



Note: The graphics above are intended to demonstrate the complexity of matching diagnostics and subsequent targeted therapies to a patient's individual clinical situation. They are NOT intended to suggest or direct neither the selection of the proper diagnostic tests, nor to advise or serve as a reference to any associated therapy.

Yale

Baylor

Harvard

The challenges surrounding the diagnosis & prognosis of cancer, and the subsequent decisions on selecting the therapeutic path, are becoming increasingly complex. One thing is clear – the treatment of cancer is no longer a one-size-fits-all approach, but rather the selection of therapy pathways carefully tailored to the patient's unique situation.

The field of advanced molecular testing, and the advent of next-generation-sequencing, brings with it increasingly complex diagnostic alternatives. These rapidly developing diagnostic tools evaluate dozens-to-hundreds of genes, across various technology platforms, using a variety of amplification, enrichment, analysis and bioinformatics tools to arrive at the results. Similarly, there is no single test that is suitable for all cancer patients.

SmartGen™ is a combination of academically-based diagnostic tools that were developed utilizing the expertise of faculty at world-leading academic institutions such as Baylor College of Medicine, Harvard, and Yale Medical School. Precipio's **SmartGen™** offers the most robust and advanced suite of diagnostic tools available.

Table of Tests

Cancer Panels	Genes	Specimen Type	DNA*	Test Methodology	TAT
NGS-421 Comprehensive Cancer Panel	421	Paraffin Block Tumor >50% Tissue	400ng DNA	Whole Exon sequencing by NGS	7-10 days
NGS-409 Comprehensive Cancer Panel	409	Paraffin Block Tumor >50% Tissue	40ng DNA	Whole Exon sequencing by NGS	7-10 days
NGS-50 Solid tumor Cancer Panel	50	Paraffin Block Tumor >30% Tissue	10ng DNA	Hotspot Mutation Sequencing by NGS	10-14 days
NGS-48 Leukemia/MDS/MPN Cancer Panel	48	Peripheral Blood (Purple Top Tube); Bone Marrow Aspirate (Purple Top Tube); Bone Marrow Clot Section	20ng DNA	Hotspot Mutation Sequencing by NGS	10-14 days
TP - Tumor Profiling Cancer Panel	12	Paraffin Block; Fine needle biopsy; aspirate; Cell block; Cytology fluid	10ng DNA	TaqMan Array PCR +/- Laser Capture Microdissection	10-14 days

* DNA minimum requirements

Hereditary Panels	Genes	Specimen Type	Test Methodology	TAT
NGS-47 Comprehensive Cancer Panel	47	Blood (EDTA Purple top)	Full Gene Sequencing by NGS and Deletion/Duplication Analysis	10-12 weeks
NGS-20 Breast/Ovarian Cancer Panel	20	Blood (EDTA Purple top)	Full Gene Sequencing by NGS and Deletion/Duplication Analysis	10-12 weeks
NGS-7HR Breast High-Risk Cancer Panel	7	Blood (EDTA Purple top)	Full Gene Sequencing by NGS and Deletion/Duplication Analysis	3 - 4 weeks
NGS-18 GI/Colorectal Cancer Panel	18	Blood (EDTA Purple top)	Full Gene Sequencing by NGS and Deletion/Duplication Analysis	10-12 weeks
NGS-11HR Colorectal High-Risk Cancer Panel	11	Blood (EDTA Purple top)	Full Gene Sequencing by NGS and Deletion/Duplication Analysis	6 - 8 weeks
NGS-17 Brain/CNS/PNS Cancer Panel	17	Blood (EDTA Purple top)	Full Gene Sequencing by NGS and Deletion/Duplication Analysis	8-10 weeks
NGS-14 Endocrine Cancer Panel	14	Blood (EDTA Purple top)	Full Gene Sequencing by NGS and Deletion/Duplication Analysis	10-12 weeks
NGS-11 Renal Cancer Panel	11	Blood (EDTA Purple top)	Full Gene Sequencing by NGS and Deletion/Duplication Analysis	8-10 weeks
NGS-9 Pheochromocytoma; Paraganglioma Cancer Panel	9	Blood (EDTA Purple top)	Full Gene Sequencing by NGS and Deletion/Duplication Analysis	8-10 weeks

Whole Exome Sequencing	Genes	Specimen Type*	Shipping*	TAT
Germline Whole Exome	~ 22,000	Blood – min 10cc EDTA (purple top)	Express ship at room temperature in an insulated container. Do not heat or freeze. Sample must arrive within 48 hrs.	15 weeks
Cancer Whole Exome	~ 22,000	Fresh/Frozen Tumor tissue: 200 mg (0.5-1.0 cm3) Fresh tissue snap frozen at -20°C. Store at -20°C.	Express ship on frozen on dry iced in an insulated container. Do not allow to thaw.	15 weeks
		Blood – min 10cc EDTA (purple top)	Express ship at room temperature in an insulated container. Do not heat or freeze. Sample must arrive within 48 hrs.	

* Please contact our lab to discuss specimen and shipping logistics prior to ordering these tests.

Omnia™ Utilizing the expertise of prominent faculty from premier academic institutions, we will provide you with the guidance and support to select the appropriate test for your patient. Our Omnia™ option provides each patient case a review of your patient's clinical situation, to arrive at a recommendation for the appropriate test.

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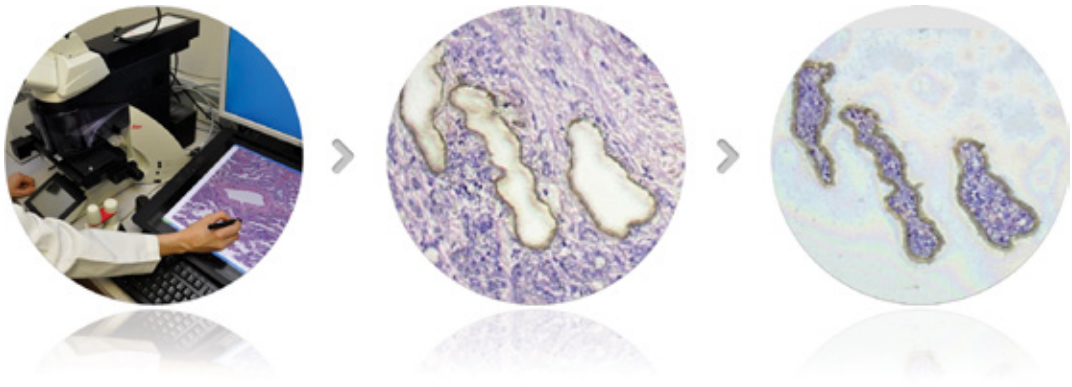
Laser-Capture Micro-Dissection

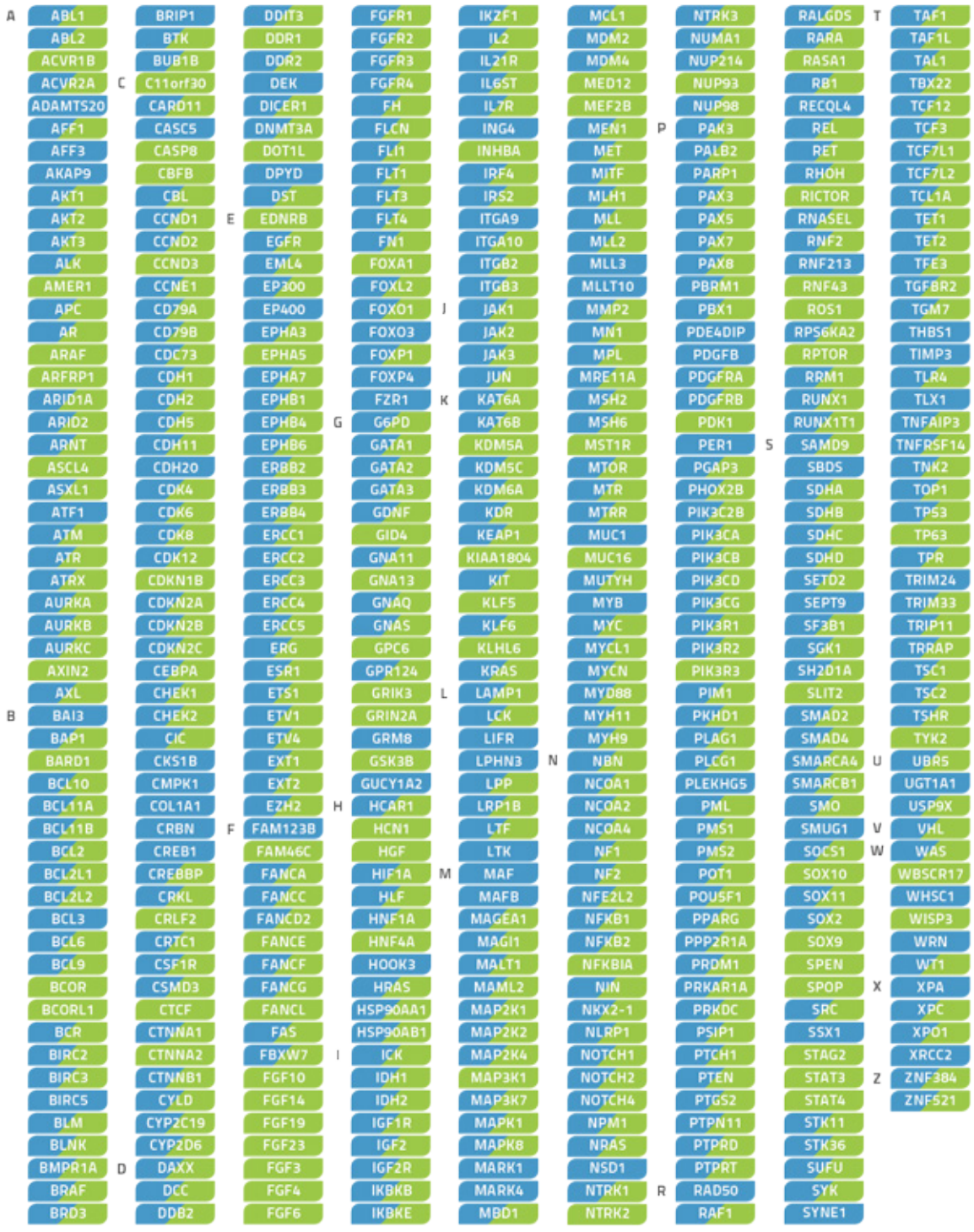
Laser-capture micro-dissection is a specimen preparation technique conducted by highly trained pathologists, to selectively extract tumor cells (as opposed to non-tumor cells) for the analysis of the relevant nucleic acids. This enables testing on very limited sample sizes, and decreases the risk of diluting the sample with normal or benign DNA that can yield inconclusive or false negative results.



As always, the academic expertise is coupled with Precipio's high level of service you have come to expect from us. Our easy-to-use requisitions; reliable logistics; rapid turnaround time; and digital report delivery via our iLabConnect™ system, brings the world's leading academic-based diagnostics, to your fingertips, to support you in giving your patients the care they deserve.

Sample SmartGen™ Report

SmartGen™ Whole Exon (409/421) Gene Cancer Panels



Gene appearing in BOTH the 409 and 421 panels
Gene appearing in the 409 panel ONLY
Gene appearing in the 421 panel ONLY

Precipio Diagnostics

SmartGen™ Hotspot Mutation Panels

NGS-50
Comprehensive Solid Tumor Gene Cancer Panel

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

NGS-48
Comprehensive Leukemia/MDS/MPN Gene Cancer Panel

ABL1, ASXL1, BRAF, CBL, CDKN2A, CEBPA, CREBBP, CRLF2, CSF1R, CTCF, DNM2, DNMT3A, EED, EP300, ETV6, EZH2, FBXW7, FLT3, GATA1, HRAS, IDH1, IDH2, IKZF1, IKZF3, IL7R, JAK2, JAK3, KIT, KRAS, MPL, NOTCH1, NPM1, NRAS, PAX5, PDGFRA, PHF6, PTEN, PTPN11, RELN, RUNX1, SF3B1, SRSF2, SUZ12, TAL1, TET2, TP53, U2AF1, WT1

NGS-47
Hereditary Comprehensive Cancer Panel

ALK, APC, ATM, BMPR1A, BRCA1, BRCA2, BRIP1, CDC73, CDH1, CDKN1C, CDKN2A, CHEK2, EPCAM, FH, FLCN, GPC3, MAX, MEN1, MET, MLH1, MSH2, MSH6, MUTYH, NBN, NF1, NF2, PALB2, PHOX2B, PMS1, PMS2, PRKAR1A, PTCH1, PTEN, RAD51C, RAD51D, RET, SDHAF2, SDHB, SDHC, SDHD, SMAD4, STK11, SUFU, TMEM127, TP53, VHL, WT1

NGS-20
Hereditary Breast/Ovarian Cancer Panel

(NGS-7HR) High Risk Cancer Panel

ATM, BRCA1, BRCA2, BRIP1, CDH1, CHEK2, EPCAM, MLH1, MSH2, MSH6, MUTYH, NBN, PALB2, PMS1, PMS2, PTEN, RAD51C, RAD51D, SKT11, TP53

NGS-18
GI/Colorectal Cancer Panel

(NGS-11HR) High Risk Cancer Panel

APC, BMPR1A, BRCA1, BRCA2, CDH1, CDKN2A, CHEK2, EPCAM, MLH1, MSH2, MSH6, MUTYH, PMS1, PMS2, PTEN, SMAD4, SKT11, TP53

NGS-17
Hereditary Brain/CNS/PNS Cancer Panel

ALK, APC, ATM, MEN1, MLH1, MSH2, MSH6, NBN, NF1, NF2, PALB2, PHOX2B, PMS2, PTCH1, SUFU, TP53, VHL

NGS-14
Hereditary Endocrine Cancer Panel

CDC73, MAX, MEN1, NF1, PRKAR1A, PTEN, RET, SDHAF2, SDHB, SDHC, SDHD, TMEM127, TP53, VHL

NGS-11
Hereditary Renal Cancer Panel

CDKN1C, FH, FLCN, GPC3, MET, PALB2, PTEN, SDHB, SDHD, VHL, WT1

NGS-9
Hereditary Pheochromocytoma/ Paraglioma Cancer Panel

MAX, NF1, RET, SDHAF2, SDHB, SDHC, SDHD, TMEM127, VHL

SmartGen™ Taqman Actionable Therapy Panel

TP-12
Taqman Array Actionable Cancer Panel

AKT1, BRAF, EGFR, ERBB2, KRAS, MEK1, NRAS, PIK3CA

* For NSCLC, Reflex to ALK & ROS1 rearrangement by FISH

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