

Comprehensive Profiling.

UNITED™ detects clinically-relevant genomic alterations in both DNA and RNA including microsatellite instability (MSI) and tumor mutational burden (TMB) biomarkers from FFPE tissue.

Provides comprehensive genomic analysis and biomarker status from limited tissue in one test with turnaround time in 2 weeks.

572

DNA targets

SNVs, Indels, CNVs,
TMB and MSI

71

RNA targets

Fusion and splice
variant mutations

2

weeks

Turnaround
Time

Benefits of UNITED™

- ✓ Improves therapy recommendations with comprehensive total nucleic acid (DNA+RNA) genomic analysis¹
- ✓ Matches patients to FDA-approved targeted therapies² and available clinical trials
- ✓ Covers all solid tumor genes recommended by NCCN Guidelines³, ICGC⁴, and TCGA⁵

Cancer Types Covered

Multiple Solid Tumor Types Including Lung, Breast, Ovarian, Stomach, Liver, Prostate, Cholangiocarcinoma, Cervix, Colon, Nasopharyngeal and others

Suitable for

- Newly diagnosed patients
- Recurrent and metastatic disease
- Patients who are not responding well to current standard-of-care treatments

[1] Rodon, J. et al. Nat Med. 2019;25:751–758. [2] Li, MM. et al. J Mol Diagn. 2017;19(1):4–23.
[3] NCCN Clinical Practice Guidelines in Oncology. NCCN.
[4] Zhang, J. Nat Biotechnol. 2019;37:367–369. [5] The Cancer Genome Atlas Program. National Cancer Institute.

List of FDA-approved Matched Therapy

Cancer Type	Biomarker	FDA-approved Matched Therapy
Breast cancer	<i>BRCA1, BRCA2</i>	Olaparib, Talazoparib
	<i>PIK3CA</i>	Alpelisib
	<i>ERBB2 (HER2)</i>	Lapatinib, Margetuximab, Neratinib, Pertuzumab, Trastuzumab Emtansine, Trastuzumab, Tucatinib
Cholangiocarcinoma	<i>FGFR2</i>	Infigratinib, Pemigatinib
	<i>IDH1</i>	Ivosidenib
Colorectal cancer	<i>BRAF</i>	Cetuximab, Encorafenib
	<i>RAS (Wild-type)</i>	Cetuximab, Panitumumab
Gastric cancer	<i>ERBB2 (HER2)</i>	Trastuzumab Deruxtecan, Trastuzumab
GIST	<i>KIT</i>	Imatinib
Lymphoma	<i>ALK</i>	Crizotinib
Melanoma	<i>BRAF</i>	Binimetinib, Cobimetinib, Dabrafenib, Encorafenib, Trametinib, Vemurafenib
NSCLC	<i>ALK</i>	Alectinib, Brigatinib, Ceritinib, Crizotinib, Lorlatinib
	<i>BRAF</i>	Dabrafenib, Trametinib
	<i>EGFR</i>	Afatinib, Amivantamab-vmjw, Dacomitinib, Erlotinib, Gefitinib, Osimertinib
	<i>ROS1</i>	Crizotinib, Entrectinib
	<i>RET</i>	Pralsetinib, Selpercatinib
	<i>MET</i>	Tepotinib, Capmatinib
	<i>KRAS</i>	Sotorasib
	<i>BRCA1, BRCA2</i>	Niraparib, Olaparib, Rucaparib
Pancreatic cancer	<i>BRCA1, BRCA2</i>	Olaparib
Prostate cancer	<i>BRCA1, BRCA2</i>	Olaparib, Rucaparib
Solid tumors	<i>TMB-H</i>	Pembrolizumab
	<i>NTRK</i>	Entrectinib, Larotrectinib
	<i>MSI</i>	Ipilimumab, Nivolumab, Pembrolizumab
Thyroid cancer	<i>RET</i>	Pralsetinib, Selpercatinib
Urothelial cancer	<i>FGFR2, FGFR3</i>	Erdafitinib

Test Specifications

Methodology	Ultra-deep next-generation sequencing
Genomic alterations profiled	SNVs, CNVs, indels, fusions, splice variants, MSI, and TMB
Sample requirement	FFPE tumor tissue
Turnaround time	2 weeks upon receipt of specimen in the Singapore Laboratory

	Sensitivity	Specificity
Single Nucleotide Variants (SNVs)	100%	>99.9%
Insertions/Deletions (Indels)	100%	>99.9%
Fusions	100%	99.7%
MSI-High	100%	100%

R ² Correlation to Whole Exome Sequencing	
Tumor Mutational Burden (TMB)	98%

- Results tested at the stated mutant allele frequencies using reference standards, FFPE cell line samples, and FFPE clinical samples.
- Sensitivity and specificity reported for SNVs and Indels are at 5% VAF

Genes with Full Coding Sequence (CDS) Coverage

Single Nucleotide Variants (SNVs), Insertions/Deletions (Indels) and Copy Number Variations (CNVs)

A	<i>BCR</i>	<i>CRKL</i>	<i>ERCC5</i>	<i>FUBP1</i>	<i>ITK</i>	<i>MET</i>
<i>ABCB1</i>	<i>BIRC3</i>	<i>CRLF2</i>	<i>ERG</i>	G	J	<i>MITF</i>
<i>ABCC3</i>	<i>BIRC5</i>	<i>CRTC1</i>	<i>ERRFI1</i>	<i>G6PD</i>	<i>JAK1</i>	<i>MKI67</i>
<i>ABCG2</i>	<i>BLM</i>	<i>CSF1R</i>	<i>ESR1</i>	<i>GATA1</i>	<i>JAK2</i>	<i>MLH1</i>
<i>ABI1</i>	<i>BMPR1A</i>	<i>CSF3R</i>	<i>ETV1</i>	<i>GATA2</i>	<i>JAK3</i>	<i>MLLT10</i>
<i>ABL1</i>	<i>BRAF</i>	<i>CSMD3</i>	<i>ETV4</i>	<i>GATA3</i>	<i>JUN</i>	<i>MLLT3</i>
<i>ABL2</i>	<i>BRCA1</i>	<i>CTCF</i>	<i>ETV5</i>	<i>GLI1</i>	K	<i>MMP2</i>
<i>ACVR1</i>	<i>BRCA2</i>	<i>CTLA4</i>	<i>ETV6</i>	<i>GLI2</i>	<i>KAT6A</i>	<i>MMP9</i>
<i>ACVR1B</i>	<i>BRD3</i>	<i>CTNNA1</i>	<i>EWSR1</i>	<i>GNA11</i>	<i>KAT6B</i>	<i>MN1</i>
<i>ACVR2A</i>	<i>BRD4</i>	<i>CTNNB1</i>	<i>EXT1</i>	<i>GNAQ</i>	<i>KDM4C</i>	<i>MPL</i>
<i>ADGRB3</i>	<i>BRIP1</i>	<i>CUX1</i>	<i>EXT2</i>	<i>GNAS</i>	<i>KDM5A</i>	<i>MRE11</i>
<i>AFDN</i>	<i>BTG1</i>	<i>CXCR4</i>	<i>EZH1</i>	<i>GOPC</i>	<i>KDM5C</i>	<i>MSH2</i>
<i>AFF1</i>	<i>BTK</i>	<i>CYLD</i>	<i>EZH2</i>	<i>GPC3</i>	<i>KDM6A</i>	<i>MSH3</i>
<i>AFF3</i>	<i>BUB1B</i>	<i>CYP2D6</i>	<i>EZR</i>	<i>GREM1</i>	<i>KDR</i>	<i>MSH6</i>
<i>AIM2</i>	C	D	F	<i>GRIN2A</i>	<i>KEAP1</i>	<i>MSI2</i>
<i>AKT1</i>	<i>CALR</i>	<i>DAXX</i>	<i>FANCA</i>	<i>GRM3</i>	<i>KIF5B</i>	<i>MST1R</i>
<i>AKT2</i>	<i>CARD11</i>	<i>DCC</i>	<i>FANCC</i>	<i>GSTP1</i>	<i>KIT</i>	<i>MTAP</i>
<i>AKT3</i>	<i>CASP8</i>	<i>DDB2</i>	<i>FANCD2</i>	H	<i>KLF4</i>	<i>MTHFR</i>
<i>ALK</i>	<i>CBFB</i>	<i>DDIT3</i>	<i>FANCE</i>	<i>H3-3A</i>	<i>KLF6</i>	<i>MTOR</i>
<i>AMER1</i>	<i>CBL</i>	<i>DDR1</i>	<i>FANCF</i>	<i>H3-3B</i>	<i>KMT2A</i>	<i>MUC1</i>
<i>APC</i>	<i>CBLB</i>	<i>DDR2</i>	<i>FANCG</i>	<i>H3C2</i>	<i>KMT2C</i>	<i>MUC16</i>
<i>AR</i>	<i>CCND1</i>	<i>DDX11</i>	<i>FANCL</i>	<i>HDAC1</i>	<i>KMT2D</i>	<i>MUTYH</i>
<i>ARAF</i>	<i>CCND2</i>	<i>DDX3X</i>	<i>FANCM</i>	<i>HDAC2</i>	<i>KNL1</i>	<i>MYB</i>
<i>ARHGAP26</i>	<i>CCND3</i>	<i>DDX5</i>	<i>FAS</i>	<i>HEY1</i>	<i>KRAS</i>	<i>MYC</i>
<i>ARID1A</i>	<i>CCNE1</i>	<i>DEK</i>	<i>FAT1</i>	<i>HGF</i>	L	<i>MYCL</i>
<i>ARID1B</i>	<i>CD274 (PD-L1)</i>	<i>DICER1</i>	<i>FAT4</i>	<i>HIF1A</i>	<i>LATS1</i>	<i>MYCN</i>
<i>ARID2</i>	<i>CD44</i>	<i>DIS3L2</i>	<i>FBXO11</i>	<i>HLA-A</i>	<i>LATS2</i>	<i>MYD88</i>
<i>ARNT</i>	<i>CD74</i>	<i>DLC1</i>	<i>FBXW7</i>	<i>HLA-C</i>	<i>LCK</i>	<i>MYH11</i>
<i>ASXL1</i>	<i>CD79A</i>	<i>DNAJB1</i>	<i>FCGR2A</i>	<i>HLF</i>	<i>LEPR</i>	<i>MYH9</i>
<i>ATF1</i>	<i>CD79B</i>	<i>DNMT1</i>	<i>FCGR3A</i>	<i>HNF1A</i>	<i>LIFR</i>	<i>MYOD1</i>
<i>ATIC</i>	<i>CDC73</i>	<i>DNMT3A</i>	<i>FES</i>	<i>HOOK3</i>	<i>LMO1</i>	N
<i>ATM</i>	<i>CDH1</i>	<i>DNMT3B</i>	<i>FGF19</i>	<i>HOXB13</i>	<i>LPP</i>	<i>NBN</i>
<i>ATR</i>	<i>CDH11</i>	<i>DPYD</i>	<i>FGF2</i>	<i>HRAS</i>	<i>LRP1B</i>	<i>NCOA1</i>
<i>ATRX</i>	<i>CDK12</i>	<i>DROSHA</i>	<i>FGF3</i>	<i>HSP90AA1</i>	<i>LTK</i>	<i>NCOA2</i>
<i>AURKA</i>	<i>CDK4</i>	<i>DYRK1B</i>	<i>FGF4</i>	<i>HSP90AB1</i>	<i>LZTR1</i>	<i>NCOA3</i>
<i>AURKB</i>	<i>CDK6</i>	E	<i>FGFR1</i>	<i>HSPH1</i>	M	<i>NCOA4</i>
<i>AXIN1</i>	<i>CDK8</i>	<i>EGF</i>	<i>FGFR2</i>	I	<i>MAF</i>	<i>NCOR1</i>
<i>AXIN2</i>	<i>CDKN1A</i>	<i>EGFR</i>	<i>FGFR3</i>	<i>ID1</i>	<i>MAFB</i>	<i>NCOR2</i>
<i>AXL</i>	<i>CDKN1B</i>	<i>EIF1AX</i>	<i>FGFR4</i>	<i>ID2</i>	<i>MALT1</i>	<i>NF1</i>
B	<i>CDKN2A</i>	<i>EIF4A2</i>	<i>FH</i>	<i>ID3</i>	<i>MAML2</i>	<i>NF2</i>
<i>B2M</i>	<i>CDKN2B</i>	<i>EML4</i>	<i>FLCN</i>	<i>IDH1</i>	<i>MAP2K1 (MEK1)</i>	<i>NFE2L2</i>
<i>BAP1</i>	<i>CDKN2C</i>	<i>EP300</i>	<i>FLI1</i>	<i>IDH2</i>	<i>MAP2K2 (MEK2)</i>	<i>NFKB2</i>
<i>BARD1</i>	<i>CDX2</i>	<i>EPAS1</i>	<i>FLNA</i>	<i>IGF1R</i>	<i>MAP2K4</i>	<i>NIN</i>
<i>BAX</i>	<i>CEBPA</i>	<i>EPCAM</i>	<i>FLT1</i>	<i>IGF2</i>	<i>MAP3K1</i>	<i>NISCH</i>
<i>BCL10</i>	<i>CHD4</i>	<i>EPHA2</i>	<i>FLT3</i>	<i>IKBKB</i>	<i>MAP3K13</i>	<i>NKX2-1</i>
<i>BCL11A</i>	<i>CHEK1</i>	<i>EPHA3</i>	<i>FLT4</i>	<i>IKBKE</i>	<i>MAP3K9</i>	<i>NOTCH1</i>
<i>BCL11B</i>	<i>CHEK2</i>	<i>EPHB4</i>	<i>FOXA1</i>	<i>IKZF1</i>	<i>MAPK1</i>	<i>NOTCH2</i>
<i>BCL2</i>	<i>CIC</i>	<i>ERBB2 (HER2)</i>	<i>FOXL2</i>	<i>IL2</i>	<i>MAX</i>	<i>NOTCH3</i>
<i>BCL2L11</i>	<i>CIP2A</i>	<i>ERBB3</i>	<i>FOXO1</i>	<i>IL21R</i>	<i>MCL1</i>	<i>NOTCH4</i>
<i>BCL3</i>	<i>CNBP</i>	<i>ERBB4</i>	<i>FOXO3</i>	<i>IL6ST</i>	<i>MDM2</i>	<i>NPM1</i>
<i>BCL6</i>	<i>COL1A1</i>	<i>ERCC1</i>	<i>FOXO4</i>	<i>IL7R</i>	<i>MDM4</i>	<i>NRAS</i>
<i>BCL9</i>	<i>CRBN</i>	<i>ERCC2</i>	<i>FOXP1</i>	<i>INPP4B</i>	<i>MED12[^]</i>	<i>NRG1</i>
<i>BCOR</i>	<i>CREB1</i>	<i>ERCC3</i>	<i>FRK</i>	<i>IRF4</i>	<i>MEN1</i>	<i>NSD1</i>
<i>BCORL1</i>	<i>CREBBP</i>	<i>ERCC4</i>	<i>FRS2</i>	<i>IRS2</i>	<i>MERTK</i>	<i>NSD2</i>

NSD3	PICALM	PRKCB	RET	SMAD2	TCF3	U
NT5C2	PIK3CA	PRRX1	RHEB	SMAD3	TCF7L2	U2AF1
NTHL1	PIK3CB	PSIP1	RHOA	SMAD4	TCL1A	UBR5
NTRK1	PIK3CD	PTCH1	RHOH	SMARCA1	TENT5C	UGT1A1
NTRK2	PIK3CG	PTEN	RICTOR	SMARCA4	TERT#	V
NTRK3	PIK3R1	PTGS2	RIT1	SMARCB1	TET1	VEGFA
NUAK2	PIK3R2	PTK2	RNF213	SMARCD1	TET2	VHL
NUMA1	PIM1	PTPN11	RNF43	SMARCE1	TFE3	W
NUP214	PLAG1	PTPRB	ROS1	SMO	TFEB	WAS
NUP98	PLCG1	PTPRC	RPS6	SOCS1	TGFB2	WEE1
NUTM1	PLCG2	PTPRD	RRM1	SOX10	TLX1	WRN
P	PLK1	PTPRK	RSPO2	SOX2	TMEM127	WT1
P2RY8	PML	PTPRT	RSPO3	SOX9	TMPRSS2	WWTR1
PAK1	PMS2	Q	RUNX1	SPEN	TNFAIP3	X
PALB2	POLB	QKI	RUNX1T1	SPOP	TNFRSF14	XPA
PARP1	POLD1	R	S	SRC	TNK2	XPC
PAX3	POLE	RAC1	SBDS	SRSF2	TOP1	XPO1
PAX5	POLQ	RAD21	SDC4	SSX1	TOP2A	XRCC1
PAX7	POLR2A	RAD50	SDHA	STAG2	TP53	XRCC2
PAX8	POT1	RAD51	SDHAF2	STAG3	TP63	Z
PBRM1	POU5F1	RAD51B	SDHB	STAT3	TPMT	ZEB1
PBX1	PPARG	RAD51C	SDHC	STAT5A	TPR	ZFH3
PDCC1LG2	PPM1D	RAD51D	SDHD	STAT5B	TRAF7	ZFP36L2
PDE4DIP	PPP2R1A	RAD54L	SEM1	STK11	TRIM24	ZNF384
PDGFB	PPP2R1B	RAF1	SETBP1	SUFU	TRIM33	ZNF521
PDGFRA	PPP6C	RANBP2	SETD2	SUZ12	TRIP11	ZRSR2
PDGFRB	PRDM1	RARA ²	SF3B1	SYK	TRRAP	
PDPK1	PREX2	RASA1	SGK1	T	TSC1	
PER1	PRF1	RB1	SH2B3	TAL1	TSC2	
PGR	PRKAA1	RBM10	SLC34A2	TBL1XR1	TSHR	
PHF6	PRKAA2	RECQL4	SLC45A3	TBX3	TTK	
PHOX2B	PRKAR1A	REL	SLCO1B1	TCF12	TYMS	

^ Exon 1 and 2 only. # Hotspots only. ² Exon 5-9 only.

RNA Analysis for Fusions and Splice Variants

ABL1	DNAJB1	FGFR3	MET	PAX3	RAF1	TAL1
AFF1	EGFR	FIP1L1	NAB2	PAX7	RARA	TCF3
AKT3	EML4	FLI1	NOTCH1	PAX8	RET	TMPRSS2
ALK	ERBB4	FOXO1	NOTCH2	PBX1	ROS1	TPM3
ASPSCR1	ERG	FUS	NPM1	PDGFB	RUNX1	YAP1
BRAF	ESR1	GLIS2	NRG1	PDGFRA	SET	
CBFA2T3	ETV1	JAK2	NTRK1	PDGFRB	SSX1	
CCDC6	ETV6	JAZF1	NTRK2	PML	SSX2	
CD274 (PD-L1)	EWSR1	KIF5B	NTRK3	PPARG	STAT6	
CRLF2	FGFR1	KMT2A	NUP214	PRKACA	STIL	
CRTC1	FGFR2	LPP	NUTM1	PRKAR1A	SUZ12	

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