

xT Gene Panel

For use with xT 648 gene panel reports

NEW YORK STATE

648 gene panel focused on actionable mutations by DNA sequencing

- Specimen: tumor only or tumor and matched normal (peripheral blood or saliva)
- Detects single nucleotide variants (SNVs) and insertions/deletions (indels) in 648 genes, as well as copy number amplifications of 8 or more are reported in ERBB2 (HER2) when the tumor percentage is $\geq 30\%$.

- Genomic rearrangements are detected in 22 genes by DNA sequencing
- Microsatellite instability status and tumor mutational burden for solid tumors
- Average coverage $\sim 500\times$

ABC11	BRIP1**	CTNNA1	ETV4	GATA3	IDH2	MAGI2	NRG1	PRDM1	SH2B3	TMPSR2
ABCC3	BTG1	CTNNA1	ETV5	GATA4	IDO1	MALT1	NSD1	PREX2	SHH	TNF
ABL1	BTG1	CTNNA1	ETV6**	GATA6	IFIT1	MAP2K1	NSD2	PRKAR1A**	SLC26A3	TNFAIP3
ABL2	BUB1B	CUL1	EWSR1	GEN1	IFIT2	MAP2K2	NTSC2	PRKDC	SLC47A2	TNFRSF14
ABRAXAS1	C11orf65	CUL3	EZH2	GLI1	IFIT3	MAP2K4	NTHL1**	PRKN	SLC9A3R1	TNFRSF17
ACTA2	C3orf70	CUL4A	FAM46C	GLI2	IFNAR1	MAP3K1	NTRK1	PRSS1	SLIT2	TNFRSF9
ACVR1 (ALK2)	C8orf34	CUL4B	FANCA	GNA11	IFNAR2	MAP3K7	NTRK2	PTCH1**	SLX4	TOP1
ACVR1B	CALR	CUX1	FANCB	GNA13	IFNGR1	MAPK1	NTRK3	PTCH2	SMAD2	TOP2A
AGO1	CARD11	CXCR4	FANCC	GNAQ	IFNGR2	MAX**	NUDT15	PTEN**	SMAD3	TP53**
AJUBA	CARM1	CYLD	FANCD2	GNAQ	IFNL3	MC1R	NUP98	PTPN11	SMAD4**	TP63
AKT1	CASP8	CYP1B1	FANCE	GPC3	IKBKE	MCL1	OLIG2	PTPN13	SMARCA1†	TPM1
AKT2	CASR	CYP2D6	FANCF	GPS2	IKZF1	MDM2	P2RY8	PTPN22	SMARCA4**	TPMT
AKT3	CBFB	CYP3A5	FANCG	GREM1	IL10RA	MDM4	PAK1	PTPRD	SMARCB1**	TRAF3
ALK	CBL	CYSLTR2	FANCI	GRIN2A	IL15	MED12	PALB2**	PTPRT	SMARCE1	TRAF7
AMER1	CBLB	DAXX	FANCL	GRM3	IL2RA	MEF2B	PALLD	QKI	SMC1A	TSC1**
APC**	CBLC	DDB2	FANCM	GSTP1	IL6R	MEN1**	PAX3	RAC1	SMC3	TSC2**
APLN	CBR3	DDR2	FAS	H19	IL7R	MET**	PAX5	RAD21	SMO	TSHR
APOB	CCDC6	DDX3X	FAT1	H3F3A	ING1	MGMT	PAX7	RAD50	SOCS1	TUSC3
AR	CCND1	DICER1**	FBXO11	HAS3	INP4B	MTB1	PAX8	RAD51	SOD2	TYMS
ARAF	CCND2	DIRC2	FBXW7	HAVCR2	IRF1	MITF	PBRM1	RAD51B	SOX10	U2AF1
ARHGAP26	CCND3	DIS3	FCGR2A	HDAC1	IRF2	MKI67	PCBP1	RAD51C**	SOX2	UBE2T
ARHGAP35	CCNE1	DIS3L2	FCGR3A	HDAC2	IRF4	MLH1**	PDCD1†	RAD51D**	SOX9	UGT1A1
ARID1A	CD19	DKC1	FDP5	HDAC4	IRS2	MLH3	PDCD1LG2	RAD54L	SPEN	UGT1A9
ARID1B	CD22	DNM2	FGF1	HGF	ITPKB	MLL2	PDGFRA**	RAF1	SPINK1	UMPS
ARID2	CD274 (PD-L1)	DNMT3A	FGF10	HIF1A	JAK1	MN1	PDGFRB	RANBP2	SPOP	VEGFA
ARID5B	CD40	DOT1L	FGF14	HIST1H1E	JAK2	MPL	PDK1	RARA	SPRED1	VEGFB
ASNS	CD70	DPYD	FGF2	HIST1H3B	JAK3	MRE11	PHF6	RASA1	SRC	VHL**
ASPSR1	CD79A	DYNC2H1	FGF23	HIST1H4E	JUN	MS4A1	PHGDH	RB1**	SRSF2	VSIR
ASXL1	CD79B	EBF1	FGF3	HLA-A	KAT6A	MSH2**	PHLPP1	RBM10†	STAG2	WEE1
ATIC	CDC73	ECT2L	FGF4	HLA-B	KDM5A	MSH3**	PHLPP2	RECQL4	STAT3	WNK1
ATM**	CDH1**	EGF	FGF5	HLA-C	KDM5C	MSH6**	PHOX2B**	RET**	STAT4	WNK2
ATP7B	CDK12	EGFR**	FGF6	HLA-DMA	KDM5D	MTAP	PIAS4	RHEB	STAT5A	WRN
ATR	CDK4**	ELGN1	FGF7	HLA-DMB	KDM6A	MTHFD2	PIK3C2B	RHOA	STAT5B	WT1**
ATRX	CDK6	EIF1AX	FGF8	HLA-DOA	KDR	MTHFR	PIK3CA	RICTOR	STAT6	XPA
AURKA	CDK8	ELF3	FGF9	HLA-DOB	KEAP1	MTOR	PIK3CB	RINT1	STK11**	XPC
AURKB	CDKN1A	ELOC (TCEB1)	FGFR1	HLA-DPA1	KEL	MTRR	PIK3CD	RIT1	SUFU**	XPO1
AXIN1	CDKN1B	EMSY	FGFR2	HLA-DPB1	KIF1B	MUTYH**	PIK3CG	RNF139	SUZ12	XRCC1
AXIN2**	CDKN1C	ENG	FGFR3	HLA-DPB2	KIT**	MYB	PIK3R1	RNF43	SYK	XRCC2
AXL	CDKN2A **	EP300	FGFR4	HLA-DQA1	KLF4	MYC	PIK3R2†	ROS1	SYNE1	XRCC3
B2M	CDKN2B	EPCAM**	FH**	HLA-DQA2	KLHL6	MYCL	PIM1	RPL5	TAF1	YEATS4
BAP1**	CDKN2C	EPHA2	FHIT	HLA-DQB1	KLLN	MYCN	PLCG1	RPS15	TANC1	ZFHX3
BARD1**	CEBPA**	EPHA7	FLCN**	HLA-DQB2	KMT2A	MYD88	PLCG2	RPS6KB1	TAP1	ZMYM3
BCL10	CEP57	EPHB1	FLT1	HLA-DRA	KMT2B	MYH11	PML	RPTOR	TAP2	ZNF217
BCL11B	CFTR	EPHB2	FLT3	HLA-DRB1	KMT2C	NBN	PMS1	RRM1	TARBP2	ZNF471
BCL2	CHD2	EPOR	FLT4	HLA-DRB5	KMT2D	NCOR1	PMS2**	RSF1	TBC1D12	ZNF620
BCL2L1	CHD4	ERBB2 (HER2)	FNTB	HLA-DRB6	KRAS	NCOR2	POLD1**	RUNX1**	TBL1XR1	ZNF750
BCL2L11	CHD7	ERBB3	FOXA1	HLA-E	L2HGDH	NF1**	POLE**	RUNX1T1	TBX3	ZNRF3
BCL6	CHEK1	ERBB4	FOXL2	HLA-F	LAG3	NF2**	POLH	RXRA	TCF3	ZRSR2
BCL7A	CHEK2**	ERCC1	FOXO1	HLA-G	LATS1	NFE2L2	POLQ	SCG5	TCF7L2	
BCLAF1†	CIC	ERCC2	FOXO3	HNF1A	LCK	NFKBIA	POT1	SDHA**	TCL1A	
BCOR	CIITA	ERCC3	FOXP1	HNF1B	LDLR	NHP2	POU2F2	SDHAF2**	TERT*	
BCORL1	CKS1B	ERCC4	FOXQ1	HOXA11	LEF1	NKX2-1	PPARA	SDHB**	TET2	
BCR	CREBBP	ERCC5	FRS2	HOXB13	LMNA	NOP10	PPARD	SDHC**	TFE3†	
BIRC3	CRKL	ERCC6	FUBP1	HRAS	LMO1	NOTCH1	PPARG	SDHD**	TFEB	
BLM	CRLF2	ERG	FUS	HSD11B2	LRRP1B	NOTCH2	PPM1D	SEC23B	TFEC	
BMPR1A**	CSF1R	ERRFI1	G6PD	HSD3B1	LYN	NOTCH3	PPP1R15A	SEMA3C	TGFBR1	
BRAF	CSF3R	ESR1	GABRA6	HSD3B2	LZTR1	NOTCH4	PPP2R1A	SETBP1	TGFBR2	
BRCA1**	CTC1	ETS1	GALNT12	HSP90AA1	MAD2L2	NPM1	PPP2R2A	SETD2	TIGIT	
BRCA2**	CTCF	ETS2	GATA1	HSPH1	MAF	NQO1	PPP6C	SF3B1	TMEM127**	
BRD4	CTLA4	ETV1	GATA2**	IDH1	MAFB	NRAS	PRCC	SGK1	TMEM173	

GENE REARRANGEMENTS BY DNA SEQUENCING†

ABL1, ALK, BCR, BRAF, EGFR, ETV6, EWSR1, FGFR2, FGFR3, MYB, NRG1, NTRK1, NTRK2, NTRK3, PAX8, PDGFRA, PML, RARA, RET, ROS1, TFE3, TMPSR2

Germline Potential Findings Gene List

APC: APC-associated conditions

ATM: Ataxia-Telangiectasia, Breast cancer susceptibility, Pancreatic cancer susceptibility

AXIN2: Oligodontia-colorectal cancer syndrome

BAP1: BAP1 tumor predisposition syndrome

BARD1: Breast cancer susceptibility

BMPR1A: Juvenile polyposis syndrome

BRCA1: Hereditary breast and ovarian cancer syndrome, Fanconi anemia

BRCA2: Hereditary breast and ovarian cancer syndrome, Fanconi anemia

BRIP1: Ovarian cancer susceptibility, Fanconi anemia

CDH1: Hereditary diffuse gastric cancer syndrome

CDK4: Melanoma susceptibility

CDKN2A: Familial atypical multiple mole-melanoma syndrome

CEBPA: Acute myeloid leukemia susceptibility

CHEK2: Breast cancer susceptibility, Colon cancer susceptibility

DICER1: DICER1 tumor predisposition syndrome

EGFR: Lung cancer susceptibility, TKI resistance

EPCAM: Lynch syndrome

ETV6: MDS susceptibility, Leukemia susceptibility, thrombocytopenia susceptibility

FH: Hereditary leiomyomatosis and renal cell cancer syndrome, Fumarate hydratase deficiency

FLCN: Birt-Hogg-Dube syndrome

GATA2: GATA2 deficiency with susceptibility to myeloid malignancies

KIT: Gastrointestinal stromal tumor susceptibility

MAX: Hereditary paraganglioma-pheochromocytoma syndrome

MEN1: Multiple endocrine neoplasia type 1, Familial isolated hyperparathyroidism

MET: Hereditary papillary renal cell carcinoma

MLH1: Lynch syndrome, Constitutional mismatch repair deficiency

MSH2: Lynch syndrome, Constitutional mismatch repair deficiency

MSH3: MSH3-associated polyposis

MSH6: Lynch syndrome, Constitutional mismatch repair deficiency

MUTYH: MUTYH-associated polyposis

NF1: Neurofibromatosis type 1

NF2: NF2-related schwannomatosis

NTHL1: NTHL1 tumor syndrome

PALB2: Breast cancer susceptibility, Pancreatic cancer susceptibility, Ovarian cancer susceptibility, Fanconi anemia

PDGFRA: GIST-plus syndrome

PHOX2B: Congenital central hypoventilation syndrome, Neuroblastoma susceptibility

PM52: Lynch syndrome, Constitutional mismatch repair deficiency

POLD1[‡]: Polymerase proofreading-associated polyposis

POLE[‡]: Polymerase proofreading-associated polyposis

PRKAR1A: Carney complex

PTCH1: Gorlin syndrome, Basal cell nevus syndrome

PTEN: PTEN hamartoma tumor syndrome

RAD51C: Ovarian cancer susceptibility, Breast cancer susceptibility, Fanconi anemia

RAD51D: Ovarian cancer susceptibility, Breast cancer susceptibility

RB1: Retinoblastoma

RET: Multiple endocrine neoplasia type 2, Familial medullary thyroid cancer

RUNX1: RUNX1 familial platelet disorder, Myeloid malignancy susceptibility

SDHA: Hereditary paraganglioma-pheochromocytoma syndrome, Leigh syndrome

SDHAF2: Hereditary paraganglioma-pheochromocytoma syndrome

SDHB: Hereditary paraganglioma-pheochromocytoma syndrome, Mitochondrial complex II deficiency

SDHC: Hereditary paraganglioma-pheochromocytoma syndrome

SDHD: Hereditary paraganglioma-pheochromocytoma syndrome

SMAD4: Juvenile polyposis, Hereditary hemorrhagic telangiectasia

SMARCA4: Rhabdoid tumor predisposition syndrome, Coffin-Siris syndrome

SMARCB1: Rhabdoid tumor predisposition syndrome, Schwannomatosis, Coffin-Siris syndrome

STK11: Peutz-Jeghers syndrome

SUFU: Gorlin syndrome, Basal cell nevus syndrome

TMEM127: Hereditary paraganglioma-pheochromocytoma syndrome

TP53: Li-Fraumeni syndrome

TSC1: Tuberous sclerosis complex

TSC2: Tuberous sclerosis complex

VHL: Von Hippel-Lindau syndrome

WT1: WT1-related Wilms tumor

This list is composed of genes associated with inherited cancer syndromes included on the xT panel and selected based on recommendations from the American College of Medical Genetics (ACMG), the National Comprehensive Cancer Network (NCCN) and/or published literature.

The primary focus of the xT panel is somatic reporting. Tempus also offers a separately ordered validated germline hereditary cancer panel through Ambry Genetics®.

* Includes promoter region

**Genes in which potential germline findings are reported

† Exons and select intronic regions only

‡ Genes that do not have full exon coverage of a primary transcript

§ Special reporting — EPCAM: Large deletions only; POLD1: Exonuclease domain only; POLE: Exonuclease domain only.

In addition to reporting on somatic variants, when a normal sample is provided, Tempus reports potential germline findings on a limited set of variants associated with inherited cancer syndromes within genes selected based on recommendations from the American College of Medical Genetics (ACMG), the National Comprehensive Cancer Network (NCCN), and/or published literature.