648 gene panel focused on actionable mutations by DNA sequencing

- Specimen: tumor and matched normal (peripheral blood or saliva)
- Single nucleotide variants, indels, and copy number variants are detected in 648 genes
- Genomic rearrangements are detected on 22 genes by DNA sequencing (others detected by RNA sequencing)
- Microsatellite instability status and tumor mutational burden are included in the xT report
- Average coverage ~ 500x

Full transcriptome by RNA sequencing

- Specimen: tumor or heme
- Unbiased gene rearrangement detection from fusion transcripts are clinically validated
- Whole transcriptome RNA expression counts are analytically validated
- Sequenced at a minimum of 25 million reads, average 50 million reads

ABCB1	BLM	CHEK2**	EPHB1	FGFR2	HLA-C	JAK1	MIB1	PAK1	PTCH1	SH2B3	TFEC
ABCC3	BMPR1A**	CIC	EPHB2	FGFR3	HLA-DMA	JAK2	MITF	PALB2**	PTCH2	SHH	TGFBR1
ABL1	BRAF	CIITA	EPOR	FGFR4	HLA-DMB	JAK3	MKI67	PALLD	PTEN**	SLC26A3	TGFBR2
ABL2	BRCA1**	CKS1B	ERBB2 (HER2)	FH**	HLA-DOA	JUN	MLH1**	PAX3	PTPN11	SLC47A2	TIGIT
ABRAXAS1	BRCA2**	CREBBP	ERBB3	FHIT	HLA-DOB	KAT6A	MLH3	PAX5	PTPN13	SLC9A3R1	TMEM127
ACTA2	BRD4	CRKL	ERBB4	FLCN**	HLA-DPA1	KDM5A	MLLT3	PAX7	PTPN22	SLIT2	TMEM173
ACVR1 (ALK2)	BRIP1**	CRLF2	ERCC1	FLT1	HLA-DPB1	KDM5C	MN1	PAX8	PTPRD	SLX4	TMPRSS2
ACVR1B	BTG1	CSF1R	ERCC2	FLT3	HLA-DPB2	KDM5D	MPL	PBRM1	PTPRT	SMAD2	TNF
AGO1	BTK	CSF3R	ERCC3	FLT4	HLA-DQA1	KDM6A	MRE11	PCBP1	QKI	SMAD3	TNFAIP3
AJUBA	BUB1B	CTC1	ERCC4	FNTB	HLA-DQA2	KDR	MS4A1	PDCD1	RAC1	SMAD4**	TNFRSF14
AKT1	C11orf65	CTCF	ERCC5	FOXA1	HLA-DQB1	KEAP1	MSH2**	PDCD1LG2	RAD21	SMARCA1	TNFRSF17
AKT2	C3orf70	CTLA4	ERCC6	FOXL2	HLA-DQB2	KEL	MSH3**	PDGFRA	RAD50	SMARCA4	TNFRSF9
AKT3	C8orf34	CTNNA1	ERG	FOXO1	HLA-DRA	KIF1B	MSH6**	PDGFRB	RAD51	SMARCB1	TOP1
ALK	CALR	CTNNB1	ERRFI1	FOXO3	HLA-DRB1	KIT	MTAP	PDK1	RAD51B	SMARCE1	TOP2A
AMER1	CARD11	CTRC	ESR1	FOXP1	HLA-DRB5	KLF4	MTHFD2	PHF6	RAD51C**	SMC1A	TP53**
APC**	CARM1	CUL1	ETS1	FOXQ1	HLA-DRB6	KLHL6	MTHFR	PHGDH	RAD51D**	SMC3	TP63
APLNR	CASP8	CUL3	ETS2	FRS2	HLA-E	KLLN	MTOR	PHLPP1	RAD54L	SMO	TPM1
APOB	CASR	CUL4A	ETV1	FUBP1	HLA-F	KMT2A	MTRR	PHLPP2	RAF1	SOCS1	TPMT
AR	CBFB	CUL4B	ETV4	FUS	HLA-G	KMT2B	MUTYH**	PHOX2B	RANBP2	SOD2	TRAF3
ARAF	CBL	CUX1	ETV5	G6PD	HNF1A	KMT2C	MYB	PIAS4	RARA	SOX10	TRAF7
ARHGAP26	CBLB	CXCR4	ETV6**	GABRA6	HNF1B	KMT2D	MYC	PIK3C2B	RASA1	SOX2	TSC1**
ARHGAP35	CBLC	CYLD	EWSR1	GALNT12	HOXA11	KRAS	MYCL	PIK3CA	RB1**	SOX9	TSC2**
ARID1A	CBR3	CYP1B1	EZH2	GATA1	HOXB13	L2HGDH	MYCN	PIK3CB	RBM10	SPEN	TSHR
ARID1B	CCDC6	CYP2D6	FAM46C	GATA2**	HRAS	LAG3	MYD88	PIK3CD	RECQL4	SPINK1	TUSC3
ARID2	CCND1	CYP3A5	FANCA	GATA3	HSD11B2	LATS1	MYH11	PIK3CG	RET**	SPOP	TYMS
ARID5B	CCND2	CYSLTR2	FANCB	GATA4	HSD3B1	LCK	NBN**	PIK3R1	RHEB	SPRED1	U2AF1
ASNS	CCND3	DAXX	FANCC	GATA6	HSD3B2	LDLR	NCOR1	PIK3R2	RHOA	SRC	UBE2T
ASPSCR1	CCNE1	DDB2	FANCD2	GEN1	HSP90AA1	LEF1	NCOR2	PIM1	RICTOR	SRSF2	UGT1A1
ASXL1	CD19	DDR2	FANCE	GLI1	HSPH1	LMNA	NF1	PLCG1	RINT1	STAG2	UGT1A9
ATIC	CD22	DDX3X	FANCF	GLI2	IDH1	LMO1	NF2**	PLCG2	RIT1	STAT3	UMPS
ATM**	CD274 (PD-L1)	DICER1	FANCG	GNA11	IDH2	LRP1B	NFE2L2	PML	RNF139	STAT4	VEGFA
ATP7B	CD40	DIRC2	FANCI	GNA13	IDO1	LYN	NFKBIA	PMS1	RNF43	STAT5A	VEGFB
ATR	CD70	DIS3	FANCL	GNAQ	IFIT1	LZTR1	NHP2	PMS2**	ROS1	STAT5B	VHL**
ATRX	CD79A	DIS3L2	FANCM	GNAS	IFIT2	MAD2L2	NKX2-1	POLD1**	RPL5	STAT6	VSIR
AURKA	CD79B	DKC1	FAS	GPC3	IFIT3	MAF	NOP10	POLE**	RPS15	STK11**	WEE1
AURKB	CDC73	DNM2	FAT1	GPS2	IFNAR1	MAFB	NOTCH1	POLH	RPS6KB1	SUFU	WNK1
AXIN1	CDH1**	DNMT3A	FBXO11	GREM1	IFNAR2	MAGI2	NOTCH2	POLQ	RPTOR	SUZ12	WNK2
AXIN2**	CDK12	DOT1L	FBXW7	GRIN2A	IFNGR1	MALT1	NOTCH3	POT1	RRM1	SYK	WRN
AXL	CDK4	DPYD	FCGR2A	GRM3	IFNGR2	MAP2K1	NOTCH4	POU2F2	RSF1	SYNE1	WT1**
B2M	CDK6	DYNC2H1	FCGR3A	GSTP1	IFNL3	MAP2K2	NPM1	PPARA	RUNX1 **	TAF1	XPA
BAP1	CDK8	EBF1	FDPS	H19	IKBKE	MAP2K4	NQO1	PPARD	RUNX1T1	TANC1	XPC
BARD1	CDKN1A	ECT2L	FGF1	H3F3A	IKZF1	MAP3K1	NRAS	PPARG	RXRA	TAP1	XPO1
BCL10	CDKN1B	EGF	FGF10	HAS3	IL10RA	MAP3K7	NRG1	PPM1D	SCG5	TAP2	XRCC1
BCL11B	CDKN1C	EGFR**	FGF14	HAVCR2	IL15	MAPK1	NSD1	PPP1R15A	SDHA	TARBP2	XRCC2
BCL2	CDKN2A **	EGLN1	FGF2	HDAC1	IL2RA	MAX	NSD2	PPP2R1A	SDHAF2**	TBC1D12	XRCC3
BCL2L1	CDKN2B	EIF1AX	FGF23	HDAC2	IL6R	MC1R	NT5C2	PPP2R2A	SDHB **	TBL1XR1	YEATS4
BCL2L11	CDKN2C	ELF3	FGF3	HDAC4	IL7R	MCL1	NTHL1	PPP6C	SDHC**	TBX3	ZFHX3
BCL6	CEBPA**	ELOC (TCEB1)	FGF4	HGF	ING1	MDM2	NTRK1	PRCC	SDHD**	TCF3	ZMYM3
BCL7A	CEP57	EMSY	FGF5	HIF1A	INPP4B	MDM4	NTRK2	PRDM1	SEC23B	TCF7L2	ZNF217
BCLAF1	CFTR	ENG	FGF6	HIST1H1E	IRF1	MED12	NTRK3	PREX2	SEMA3C	TCL1A	ZNF471
BCOR	CHD2	EP300	FGF7	HIST1H3B	IRF2	MEF2B	NUDT15	PRKAR1A	SETBP1	TERT*	ZNF620
BCORL1	CHD4	EPCAM**	FGF8	HIST1H4E	IRF4	MEN1**	NUP98	PRKDC	SETD2	TET2	ZNF750
BCR	CHD7	EPHA2	FGF9	HLA-A	IRS2	MET	OLIG2	PRKN	SF3B1	TFE3	ZNRF3
BIRC3	CHEK1	EPHA7	FGFR1	HLA-B	ITPKB	MGMT	P2RY8	PRSS1	SGK1	TFEB	ZRSR2

GENE REARRANGEMENTS BY DNA SEQUENCING†

ABL1	EGFR**	FGFR3	NTRK2	PML	TFE3
ALK	ETV6**	MYB	NTRK3	RARA	TMPRSS2
BCR	EWSR1	NRG1	PAX8	RET	
BRAF	FGFR2	NTRK1	PDGFRA	ROS1	

* Includes promoter region

**Genes in which incidental germline findings are reported

In addition to reporting on somatic variants, when a normal sample is provided, Tempus reports germline incidental 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.

† Exons and select intronic regions only. Detailed list provided upon request.

Germline Incidental Findings Gene List

APC	APC-Associated Conditions
ATM	Ataxia-Telangiectasia, Familial pancreatic cancer, Hereditary breast and ovarian cancer
AXIN2	Oligodontia-colorectal cancer syndrome
BMPR1A	Juvenile polyposis
BRCA1	Hereditary breast and ovarian cancer
BRCA2	Hereditary breast and ovarian cancer
BRIP1	Fanconi anemia, ovarian cancer susceptibility
CDH1	Hereditary diffuse gastric cancer, breast cancer susceptibility
CDKN2A	Hereditary melanoma
CEBPA	Acute myeloid leukemia
CHEK2	Breast cancer susceptibility, colon cancer susceptibility
EGFR*	Lung cancer, TKI resistance
EPCAM*	Lynch syndrome
ETV6	Leukemia, thrombocytopenia
FH	Hereditary leiomyomatosis and renal cell cancer
FLCN	Birt-Hogg-Dube syndrome
GATA2	Emberger syndrome, Predisposition to myeloid malignancies, Immunodeficiency
MEN1	Multiple endocrine neoplasia type 1
MLH1	Lynch syndrome
MSH2	Lynch syndrome
MSH3	Colon cancer susceptibility
MSH6	Lynch syndrome
MUTYH	MYH-associated polyposis
NBN	Nijmengen breakage syndrome, breast cancer susceptibility
NF2	Neurofibromatosis type 2
PALB2	Hereditary pancreatic cancer, Fanconi anemia, hereditary breast and ovarian cancer
PMS2	Lynch syndrome
POLD1*	Colorectal cancer susceptibility
POLE*	Colorectal cancer susceptibility
PTEN	PTEN hamartoma tumor syndrome
RAD51C	Fanconi anemia, hereditary breast and ovarian cancer
RAD51D	Hereditary breast and ovarian cancer
RB1	Retinoblastoma
RET	Familial medullary thyroid cancer
RUNX1	Acute myeloid leukemia
SDHAF2	Hereditary paraganglioma-pheochromocytoma syndrome
SDHB	Hereditary paraganglioma-pheochromocytoma syndrome
SDHC	Hereditary paraganglioma-pheochromocytoma syndrome
SDHD	Hereditary paraganglioma-pheochromocytoma syndrome
SMAD4	Juvenile polyposis
STK11	Peutz-Jeghers 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 GeneDx.

***Special reporting**
EGFR: p.T790M, p.L792H, p.C797G, p.C797S (resistance alterations only)
EPCAM: Large deletions only
POLD1: Exonuclease domain only
POLE: Exonuclease domain only