

Minimal Residual Disease (MRD) Tests

MRD Tests by Flow Cytometry (ALL, Multiple Myeloma, AML)

Test Code	Test Name	TAT (Working Days)	Additional Info Needed
MGM1374	T- MRD (T-ALL)	2	Baseline Flow Cytometry Report
MGM1230	B MRD (B-ALL)	2	
MGM1667	Multiple Myeloma MRD By Flow cytometry	2	
MGM2468	Acute Myeloid Leukemia (AML) - MRD	2	

Sample Type: Peripheral Blood or Bone Marrow Aspirate (preferred) in EDTA (3 to 4 ml)
Shipping Temperature: Shipped at 20° - 25° C | **Test Location:** Bangalore

MRD Tests by NGS (AML & Other Leukemias)

Test Code	Test Name	TAT (Working Days)	Additional Info Needed
MGM2734	Acute Myeloid Leukemia (AML) MRD by NGS - SNVs & Indels	14	Molecular Marker Positive Report <ul style="list-style-type: none"> FISH for translocation RT-PCR for SNVs, InDels or Translocation NGS for SNVs, InDels or Translocation
MGM2733	Acute Myeloid Leukemia (AML) MRD by NGS - Fusions	14	
MGM2534	Leukemia MRD Test by NGS - SNVs and InDels	14	
MGM2603	Leukemia MRD Test by NGS - Fusions	14	

Sample Type: Peripheral Blood or Bone Marrow Aspirate (preferred)
Shipping Temperature: Shipped at 2° - 8° C & to reach lab within 48 hours of collection | **Test Location:** Bangalore
Refer to the gene list at the end.

BCR-ABL1 MRD Test by Quantitative RT PCR

Test Code	Test Name	TAT (Working days)	Additional Info Needed
MGM1536	BCR-ABL1 MRD	5	Previous BCR-ABL1 Reports / Clinical Diagnosis

Sample Type: Peripheral Blood in EDTA tube or Bone Marrow Aspirate (preferred)

Shipping Temperature: Shipped at 2° - 8° C & to reach lab within 48 hours of collection | **Test Location:** Bangalore

Clonoseq based MRD by NGS

Test Code	Test Name	TAT (Working days)	Additional Info Needed
MGM2602	ClonoSeq ID & MRD (Combo)	13	Clinical Diagnosis & Other Details

Clonality ID Sample Type: 3-5 Unstained air dried Smear Slides (Bone marrow Aspirate OR Peripheral Blood)

Tracking MRD Sample Type: Bone Marrow Aspirate (preferred)/ Peripheral Blood in EDTA (3 to 4 ml) t

Shipping Temperature: Shipped at 2° - 4° C

MRD Tests for Solid Tumors by NGS - Liquid Biopsy

Test Code	Test Name	TAT (Working days)	Additional Info Needed
MGM2649	Minimal Residual Disease (MRD) by NGS in Solid Tumours (Liquid Biopsy)	14	Baseline Tumour NGS Report or Baseline Tumour Sample (FFPE Block) to be Tested Separately by Comprehensive Tumour Panel

Sample Type: Peripheral Blood in Streck Tube (2 tube of 10ml each) | **Test Location:** Bangalore

Gene List MGM2734: AML MRD by NGS (SNVs & InDels) - 16 Genes

FLT3	IDH1	IDH2	NPM1	CEBPA	TP53	ASXL1	BCOR
EZH2	RUNX1	SF3B1	SRSF2	STAG2	U2AF1	ZRSR2	WT1

MGM2733: AML MRD by NGS (Fusions) - 6 Fusions

PML/RARA	BCR/ABL	CBFB/MYH11	KMT2A/MLLT3	DEK/NUP214	RUNX1/RUNX1T1
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Gene List Leukemia MRD (SNVs & InDels)

ABL1	CDKN2B	ID3	NRAS	SMC3
ARAF	CDKN2C	IDH1	OSBPL10	SOCS1
ARID1A	CEBPA	IDH2	PAX5	SRSF2
ASXL1	CREBBP	IKZF1	PDCD1LG2	STAG2
ASXL2	CSF3R	INPP5D	PDGFRA	STAT3
ATM	CTNNA1	IRF4	PDGFRB	STAT5B
ATRX	CUX1	ITPKB	PHF6	STAT6
B2M	CXCR4	JAK1	PIK3CA	SUSD2
BCL2	CYLD	JAK2	PLCG1	TCF3
BCL6	DIS3	JAK3	POT1	TENT5C
BCOR	DNMT3A	KDM6A	PRDM1	TET1
BCORL1	EP300	KIT	PRKCB	TET2
BIRC3	EPHA7	KLF2	PRPF8	TNFAIP3
BRAF	ETNK1	KLHL14	PTEN	TNFRSF14
CALR	ETV6	KMT2A	PTPN1	TP53
CARD11	EZH2	KMT2D	PTPN11	TRAF3
CBL	FAS	KRAS	RAD21	U2AF1
CBLB	FBXW7	MAP2K1	RB1	VAV1
CBLC	FGFR3	MEF2B	REL	WT1
CCND1	FLT3	MFHAS1	RHOA	XPO1
CCND3	FYN	MPL	RUNX1	ZRSR2
CCR4	GATA1	MYBBP1A	SETBP1	
CCR7	GATA2	MYD88	SETD2	
CD28	GATA3	NF1	SF3B1	
CD58	GNA13	NFE2	SGK1	
CD79B	GNAS	NOTCH1	SMARCA4	
CDKN1A	HNRNPA2B1	NOTCH2	SMC1A	
CDKN2A	HRAS	NPM1	SMC2	

MRD Fusions / Gene Rearrangements Covered

Acute Myeloid Leukemia (AML)	
Fusion	Chromosomal Rearrangements
RUNX1-RUNX1T1	t(8;21)(q22;q22.1)
CBFA2T3-GLIS2	inv(16)(p13q24)
GLIS2-CBFA2T3	inv(16)(p13.3q24.3)
CBFB-MYH11	inv(16)(p13q22), t(16;16)(p13;q22), del(16)(q22)
PML-RARA	t(15;17)(q24;q21)
BCR-ABL1	t(9;22)(q34.12;q11.23)
ETV6-ABL1	t(9;12)(q34.12;p13.2)
ZMIZ1-ABL1	t(9;10)(q34.12;q22.3)
ETV6-ABL2	t(1;12)(q25.2;p13.2)
RANBP2-ALK	NA
CHIC2-ETV6	t(4;12)(q12;p13.2)
MEF2D-CSF1R	t(1;5)(q22;q33)
DEK-NUP214	t(6;9)(p22;q34)
NUP214-DEK	t(6;9)(p22;q34)
FUS-ERG	t(16;21)(p11;q22)
MNX1-ETV6	t(7;12)(q36;p13)
HERVK-FGFR1	t(8;19)(p11.2;p13.3)
TRIM24-FGFR1	t(7;8)(q33;p11.23)
HOXA11-BZW2	t(7;7)(p15.2;p21.1)

Acute Myeloid Leukemia (AML)	
Fusion	Chromosomal Rearrangements
TRB-HOXA11	inv(7)(p15.2q34)ort(7;7)(p15.2;q34)
NUP98-HOXA13	t(7;11)(p15.2;p15.4)
GATA2-HOXA9	t(3;7)(q21.3;p15.2)
HOXA9-ANGPT1	t(7;8)(p15.2;q23.1)
NIPBL-HOXA9	t(5;7)(p13.2;p15.2)
NUP98-HOXA9	t(7;11)(p15.2;p15.4)
NUP98-HOXC11	t(11;12)(p15.4;q13.13)
NUP98-HOXC13	t(11;12)(p15.4;q13.13)
BCR-JAK2	t(9;22)(p24;q11.23)
PCM1-JAK2	t(8;9)(p22;p24.1)
CREBBP-KAT6A	t(16;8)(p13.3;p11.21)
KAT6A-CREBBP	t(8;16)(p11;p13)
KAT6A-EP300	t(8;22)(p11;q13)
NUP98-KDM5A	t(11;12)(p15.4;p13.33), t(11;12)(p15.5;p13.5)
TPM4-KLF2	TPM4-KLF2
KMT2A-ELL	t(11;19)(q23;p13.1)
KMT2A-EP300	t(11;22)(q23.3;q13.2)
KMT2A-EPS15	t(1;11)(p32;q23)

MRD Fusions / Gene Rearrangements Covered

Acute Myeloid Leukemia (AML)	
Fusion	Chromosomal Rearrangements
KMT2A-FOXO3	t(11;6)(q23.3;q21)
KMT2A-FOXO4	t(X;11)(q13;q23)
KMT2A-MLLT1	t(11;19)(q23;p13.3)
KMT2A-MLLT10	t(10;11)(p12;q23)
KMT2A-MLLT11	t(1;11)(q21;q23)
KMT2A-MLLT3	t(9;11)(p21;q23)
KMT2A-MLLT6	t(11;17)(q23.3;q12)
KMT2A-PICALM	t(11;11)(q14;q23), inv(11)(q14q23)
KMT2A-SEPT6	t(X;11)(q24;q23.3)
KMT2A-SEPT9	t(11;17)(q23.3;q25.2)
NUP98-KMT2A	t(11;11)(inv)(p15.4;q23.3)
ETV6-MECOM	t(12;3)(p13.2;q26.2)
GATA2-MECOM	inv(3)(q21.3q26.2) and t(3;3)(q21.3;q26.2)
MECOM-CDK6	t(3;7)(q26.2;q21.2)
RBM15-MKL1	t(1;22)(p13.3;q13.1)
PICALM-MLLT10	t(10;11)(p12;q21)
MYB-GATA1	t(X;6)(p11;q23)

Acute Myeloid Leukemia (AML)	
Fusion	Chromosomal Rearrangements
NF1-LRRC37B	(17q11)
NUP98-NSD1	t(5;11)(q35;p15.5)
ETV6-NTRK3	t(12;15)(p13.2;q25.3)
SQSTM1-NUP214	t(5;9)(q35.3;q34.13)
ERC1-PDGFRB	t(5;12)(q32;p13.33)
TRIP11-PDGFRB	t(5;14)(q32;q32.12)
ETV6-PRDM16	t(1;12)(p36.32;p13.2)
ETV6-RARA	t(12;17)(p13.2;q21.2)
FIP1L1-RARA	t(4;17)(q12;q21.2)
GTF2I-RARA	t(7;17)(q11.23;q21.2)
NPM1-RARA	t(5;17)(q35.1;q21.2)
NUMA1-RARA	t(11;17)(q13.4;q21.2)
STAT5B-RARA	t(17;17)(q21;q21), dup(17)(q12q21)
ZBTB16-RARA	t(11;17)(q23;q21)
MECOM-RUNX1	t(3;21)(q26.2;q22.1)
RUNX1-CBFA2T3	t(21;16)(q22.12;q24.3)
RUNX1-PRDM16	t(21;1)(q22.12;p36.32)
NUP98-TOP1	t(11;20)(p15.4;q12), t(11;20)(p15.4;q11)

MRD Fusions / Gene Rearrangements Covered

Acute Lymphoblastic Leukemia (ALL)		Acute Lymphoblastic Leukemia (ALL)	
Fusion	Chromosomal Rearrangements	Fusion	Chromosomal Rearrangements
BCR-ABL1	t(9;22)(q34.12;q11.23)	FOXP1-ABL1	t(3;9)(p13;q34.12)
ETV6-RUNX1	t(12;21)(p13;q22)	LSM14A-ABL1	t(9;19)(q34.12;q13.11)
KMT2A-AFF1	t(4;11)(q21.3;q23.3)	NUP153-ABL1	t(6;9)(p22.3;q34.12)
KMT2A-CREBBP	t(11;16)(q23.3;p13.3)	NUP214-ABL1	t(9;9)(q34.13;q34.12)
KMT2A-ELL	t(11;19)(q23;p13.1)	RANBP2-ABL1	t(2;9)(q12.3;q34.12)
KMT2A-EP300	t(11;22)(q23.3;q13.2)	RCSD1-ABL1	t(1;9)(q24.2;q34.12)
KMT2A-EPS15	t(1;11)(p32;q23)	SFPQ-ABL1	t(1;9)(p34.3;q34.12)
KMT2A-FOXO3	t(11;6)(q23.3;q21)	SNX1-ABL1	SNX1/ABL1
KMT2A-FOXO4	t(X;11)(q13;q23)	SNX2-ABL1	t(5;9)(q23.2;q34.12)
KMT2A-MLLT1	t(11;19)(q23;p13.3)	SPTNA1-ABL1	SPTNA1/ABL1
KMT2A-MLLT10	t(10;11)(p12;q23)	ZMIZ1-ABL1	t(9;10)(q34.12;q22.3)
KMT2A-MLLT11	t(1;11)(q21;q23)	PAG1-ABL2	PAG1-ABL2
KMT2A-MLLT3	t(9;11)(p21;q23)	RCSD1-ABL2	t(1;1)(q24.2;q25.2)
KMT2A-MLLT4	t(6;11)(q27;q23)	ZC3HAV1-ABL2	t(1;7)(q25;q34)
KMT2A-MLLT6	t(11;17)(q23.3;q12)	BCL11B-TLX3	t(5;14)(q35;q32)
KMT2A-PICALM	t(11;11)(q14;q23), inv(11)(q14q23)	IGH-BCL2	t(14;18)(q32.33;18q21.33)
KMT2A-SEPT6	t(X;11)(q24;q23.3)	KANK1-CBL	t(9;11)(p24.3;q23.3)
KMT2A-SEPT9	t(11;17)(q23.3;q25.2)	CDK6-KMT2A	t(7;11)(q21.2;q23.3)
KMT2A-TET1	t(10;11)(q22;q23)	CHIC2-ETV6	t(4;12)(q12;p13.2)
BTG1-MYC	t(8;12)(q24.21;q22)	IGH-CRLF2	t(X;14)(p22;q32) or t(Y;14)(p11;q32)
IGH-MYC	t(8;14)(q24.21;q32.33)	P2RY8-CRLF2	del(X)(p22p22), del(Y)(p11p11)
IGK-MYC	t(2;8)(p12;q24.21)	SSBP2-CSF1R	t(5;5)(q14.1;q32)
IGL-MYC	t(8;22)(q24.21;q11.12)	TBL1XR1-CSF1R	t(3;5)(q26.32;q32)
TRA-MYC	t(8;14)(q24.21;q11.2)	CSF2RA-CRLF2	del(X)(p22.33p22.33)
CENPC-ABL1	t(4;9)(q13.2;q34.12)	DNTT-BLNK	t(10;10)(q24;q24)
EML1-ABL1	t(9;14)(q34.12;q32.2)	EPOR-CRLF2	EPOR / CRLF2
ETV6-ABL1	t(9;12)(q34.12;p13.2)	IGH-EPOR	t(14;19)(q32.33;p13.2)

MRD Fusions / Gene Rearrangements Covered

Acute Lymphoblastic Leukemia (ALL)	
Fusion	Chromosomal Rearrangements
IGK-EPOR	t(14;19)(q32;p13)
LAIR1-EPOR	t(14;19)(q32;p13)
THADA-EPOR	THADA-EPOR
ETV6-IGH	t(12;14)(p13.2;q32.33)
MNX1-ETV6	t(7;12)(q36;p13)
PAX5-ETV6	dic(9;12)(p13;p13)
CUX1-FGFR1	t(7;8)(q22.1;p11.23)
FGFR1OP-FGFR1	t(6;8)(q27;p11.23)
ETV6-FGFR3	t(4;12)(p16.3;p13.2)
ZMYM2-FLT3	t(13;13)(q12;q12)
DPY19L1-HOXA11	t(7;7)(p14.2;p15.2)
PUM1-HOXA11	t(1;7)(p35.2;p15.2)
TRB-HOXA11	inv(7)(p15.2q34)ort(7;7)(p15.2;q34)
TRB-HOXA10	t(7;7)(p15.2;q34); inv(7)(p15.2q34)
MED12-HOXA9	t(X;7)(q13.1;p15.2)
TRB-HOXA9	t(7;7)(p15.2;q34)
IGH-IL3	t(5;14)(q31;q32)
IQGAP2-TSLP	IQGAP2/TSLP
ATF7IP-JAK2	t(9;12)(p24.1;p13.1)
BCR-JAK2	t(9;22)(p24;q11.23)
EBF1-JAK2	t(5;9)(q33.3;p24.1)
ETV6-JAK2	t(9;12)(p24.1;p13.2)
GOLGA5-JAK2	GOLGA5-JAK2
HMBOX1-JAK2	t(8;9)(p21.1;p24.1)
JAK2-ETV6	t(9;12)(p24.1;p13.2)
OFD1-JAK2	t(X;9)(p22.2;p24.1)

Acute Lymphoblastic Leukemia (ALL)	
Fusion	Chromosomal Rearrangements
PAX5-JAK2	t(9;9)(p13.2;p24.1), del(9)(p13.2;p24.1), inv(9)(p13.2;24.1)
PCM1-JAK2	t(8;9)(p22;p24.1)
PPFIBP1-JAK2	PPFIBP1-JAK2
RFX3-JAK2	t(9;9)(p24.2;p24.1)
SMU1-JAK2	t(9;9)(p21.1;p24.1)
SNX29-JAK2	t(9;16)(p24.1;p13.13)
SSBP2-JAK2	t(5;9)(q14.1;p24.1)
STRN3-JAK2	t(9;14)(p24.1;q12)
TERF2-JAK2	TERF2-JAK2
TPM3-JAK2	t(1;9)(q21.3;p24.1)
TPR-JAK2	TPR-JAK2
USP25-JAK2	t(9;21)(p24.1;q21.1)
ZNF274-JAK2	t(9;19)(p24.1;q13.43)
ZNF340-JAK2	ZNF340-JAK2
NUP98-KMT2A	t(11;11)(inv)(p15.4;q23.3)
GATAD2A-LYN	t(8;19)(q12.1;p13.11)
NCOR1-LYN	t(8;17)(q12.1;p11)
PICALM-MLLT10	t(10;11)(p12;q21)
MYH9-IL2RB	NA
ETV6-NTRK3	t(12;15)(p13.2;q25.3)
SQSTM1-NUP214	t(5;9)(q35.3;q34.13)
PAX5-PML	t(9;15)(p13.2;q24.1)
AFF1-PBX1	t(1;4)(q23.3;21.3)
TCF3-PBX1	t(1;19)(q23;p13.3)
ATF7IP-PDGFRB	t(5;12)(q32;p13.1)

MRD Fusions / Gene Rearrangements Covered

Acute Lymphoblastic Leukemia (ALL)	
Fusion	Chromosomal Rearrangements
EBF1-PDGFRB	t(5;5)(q32;q33.3); del(5)(q32q33.3)
PDE4DIP-PDGFRB	t(1;5)(q21;q32)
SNX29-PDGFRB	SNX29/PDGFRB
SSBP2-PDGFRB	SSBP2-PDGFRB
TNIP1-PDGFRB	t(5;5)(q32;q33.1)
ZEB2-PDGFRB	ZEB2/PDGFRB
ZMYND8-PDGFRB	t(5;20)(q32.13;q13)
KDM6A-PTK2B	KDM6A-PTK2B
RUNX1-FGA7	t(4;21)(q28;q22)
FUS-SET	t(9;16)(q34.11;p11.2)
SET-NUP214	t(9;9)(q34.11;q34.13)
SETD2-CCDC12	3p21
TAL1-STIL	TAL1-STIL
TCF3-HLF	t(17;19)(q22;p13)
TCF3-ZNF384	t(12;19)(p13;p13)
NONO-TFE3	t(X;X)(p11;q13)
TFE3-NONO	t(X;X)(p11;q13)
MYB-TYK2	MYB-TYK2
SMARCA4-TYK2	t(19;19)(p13.2;p13.2)
ZNF340-TYK2	ZNF340-TYK2

Philadelphia chromosome-like acute lymphoblastic leukemia	
Fusion	Chromosomal Rearrangements
GOLGA5-JAK2	GOLGA5-JAK2
TPR-JAK2	TPR-JAK2
ZNF340-JAK2	ZNF340-JAK2
ATF7IP-PDGFRB	t(5;12)(q32;p13.1)
SNX29-PDGFRB	SNX29/PDGFRB
ZEB2-PDGFRB	ZEB2/PDGFRB
SNX1-ABL1	SNX1/ABL1
SPTNA1-ABL1	SPTNA1/ABL1
EPOR-CRLF2	EPOR / CRLF2
IQGAP2-TSLP	IQGAP2/TSLP
KDM6A-PTK2B	KDM6A-PTK2B
MYH9-IL2RB	NA
PAG1-ABL2	PAG1-ABL2

MRD Fusions / Gene Rearrangements Covered

Other clinically relevant fusions	
Fusion	Chromosomal Rearrangements
LRRF1P1-FGFR1	t(2;8)(q37.3;p11.23)
RUNX1-CBFA2T3	t(21;16)(q22.12;q24.3)
MECOM-RUNX1	t(3;21)(q26.2;q22.1)
RUNX1-PRDM16	t(21;1)(q22.12;p36.32)
ETV6-MECOM	t(12;3)(p13.2;q26.2)
KMT2A-EPS15	t(1;11)(p32;q23)
KMT2A-CREBBP	t(11;16)(q23.3;p13.3)
KMT2A-SEPT9	t(11;17)(q23.3;q25.2)
NUP98-KMT2A	t(11;11)(inv)(p15.4;q23.3)
BCR-JAK2	t(9;22)(p24;q11.23)
ETV6-JAK2	t(9;12)(p24.1;p13.2)
LRRFIP1-FGFR1	t(2;8)(q37.3;p11.23)

Other clinically relevant fusions	
Fusion	Chromosomal Rearrangements
NPM1-MLF1	t(3;5)(q25;q34)
NUP214-DEK	t(6;9)(p22;q34)
NUP98-KMT2A	t(11;11)(inv)(p15.4;q23.3)
PDE4DIP-PDGFRB	t(1;5)(q21;q32)
ETV6-PDGFRB	t(5;12)(q32;p13.2)
NDE1-PDGFRB	t(5;16)(q32;p13.11)
COL1A1-PDGFRB	t(5;17)(q32;q21.3)
ETV6-JAK2	t(9;12)(p24.1;p13.2)
ETV6-MECOM	t(12;3)(p13.2;q26.2)
ETV6-PDGFRB	t(5;12)(q32;p13.2)
JAK2-ETV6	t(9;12)(p24.1;p13.2)

MRD Fusions / Gene Rearrangements Covered

Other clinically relevant fusions		Other clinically relevant fusions	
Fusion	Chromosomal Rearrangements	Fusion	Chromosomal Rearrangements
DEK-NUP214	t(6;9)(p22;q34)	FGFR1OP-FGFR1	t(6;8)(q27;p11.23)
FUS-ERG	t(16;21)(p11;q22)	RANBP2-FGFR1	t(2;8)(q12.3;p11.23); t(2;8)(q13;p11.2)
PDE4DIP-PDGFRB	t(1;5)(q21;q32)	ETV6-PDGFRB	t(5;12)(q32;p13.2)
KMT2A-CREBBP	t(11;16)(q23.3;p13.3)	HIP1-PDGFRB	t(5;7)(q32;q11.23)
BCR-JAK2	t(9;22)(p24;q11.23)	RABEP1-PDGFRB	t(5;17)(q32;p13.2)
PDE4DIP-PDGFRB	t(1;5)(q21;q32)	ETV6-PDGFRB	t(5;12)(q32;p13.2)
KANK1-PDGFRB	t(5;9)(q32;p24.3)	RANBP2-ALK	NA
SART3-PDGFRB	t(5;12)(q32;q23.3)	NUP98-HOXA11	t(7;11)(p15.2;p15.4)
COL1A1-PDGFRB	t(5;17)(q32;q21.3)	SPECC1-PDGFRB	t(5;17)(q32;p11.2)
CPSF6-FGFR1	t(12;8)(q15;p11.23)	HECW1-PDGFRB	t(5;7)(q32;p14.1)
		FIP1L1-RARA	t(4;17)(q12;q21.2)