Cytogenetics : FISH PANELS

Anaplastic Large cell lymphoma
ALK Breakapart Probe (2p23.2-p23.1)

Aplastic Anemia
Del(7)(q22q31)
Centromere 6, 8 and 21
RB1/DLEU/LAMP (13q14.2 / 13q14.2 /13q34)
TP53/17CEN (17p13.1 / 17p11.1)

Alk-positive DLBCL
ALK Breakapart Probe (2p23.2-p23.1)

Alk-negative ALCL
ALK Breakapart Probe (2p23.2-p23.1)
IRF4/DUSP22 Breakapart (6p25)

AML Panel
EVI1 (MECOM) Breakapart (3q26.2)
DEK-NUP214: t(6;9)(p23;q11)
RUNX1/RUNX1T1: t(8;21)(q21.3;q22.1)
MLL (KMT2A) Breakapart (11q23.3)
ETV6 Breakapart (12p13.2)
PML/RARA: t(15;17)(q24.1;q21.1)
CBFB/MYH11 : t(16 ;16)(q22 ;q13.1)
BCR/ABL1/ASS1: t(9;22)(q34.1;q11.22)

B-ALL Adult Panel
MYC Breakapart probe (8q24.21)
BCR/ABL1: t(9;22)(q34;q22)
MLL (KMT2A) Breakapart (11q23.3)
IGH Breakapart (14q32.3)

B-ALL Child Panel
P16 (CKDKN2A) (9q21.3 / 9q12)
BCR/ABL1/ASS1: t(9;22)(q34.1;q11.22)
MLL (KMT2A) Breakapart (11q23.3)
TEL/AML1 (ETV6/RUNX1): t(12,21)(q13.2;q22.1)
IGH Breakapart (14q32.3)

B-ALL Relapse Panel
ABL2 Breakapart (1q25.2)
PDGFRB Breakapart (5q32)
JAK2 Breakapart (9p24.1)
IGH Breakapart (14q32.3)
CRLF2 Breakapart (Xp22.33 / Yp11.3)

B-NHL Panel
BCL6 Breakapart (3q27.3-q28)
MYC Breakapart probe (8q24.21)
IGH Breakapart (14q32.3)
BCL2 Breakapart (18q21.33-q22.1)

Burkitt Lymphoma Panel
BCL6 Breakapart (3q27.3-q28)
MYC Breakapart probe (8q24.21)
ATM (11p11.1-q11.1 / 11q22.3)
IGH Breakapart (14q32.3)
BCL2 Breakapart (18q21.33-q22.1)
If MYC BA positive
IGK Breakapart (2p11.2)
IGL Breakapart (22q11.21-q11.23)

CEL / HES Panel
ABL2 Breakapart (1q25.2)
PDGFRA Breakapart (4q12)
PDGFRB Breakapart (5q32)
FGFR1 Break/Ampli (8p11.23-p11.22)
JAK2 Breakapart (9p24.1)
ABL1 Breakapart (9q34)
BCR/ABL1/ASS1: t(9;22)(q34.1;q11.22)
ETV6 Breakapart (12p13.2)
FLT3 Breakapart (13q12.2-q12.3)

CLL Panel
Centromere 3 / Centromere 12
MYB/CCND3/SEC63 (6p21.1 / 6q21 / 6q23.3)
MYC Breakapart probe (8q24.21)
ATM (11p11.1-q11.1 / 11q22.3)
RB1/DLEU/LAMP (13q14.2 / 13q14.2 /13q34)
IGH Breakapart (14q32.3)
TP53/17CEN (17p13.1 / 17p11.1)

CMML-/CNL- Panel
FIP1L1/CHIC2/PDGFRA (4q12)
PDGFRB Breakapart (5q32)
FGFR1 Break/Ampli (8p11.23-p11.22)
BCR/ABL1/ASS1: t(9;22)(q34.1;q11.22)
JAK2 Breakapart (9p24.1)

Diffuse Large B-cell Lymphoma Panel
BCL6 Breakapart (3q27.3-q28)
MYC Breakapart probe (8q24.21)
IGH Breakapart (14q32.3)
BCL2 Breakapart (18q21.33-q22.1)
If MYC BA positive
IGK Breakapart (2p11.2)
IGL Breakapart (22q11.21-q11.23)

Fanconi Panel
CKS1B/CDKN2C (1p32.3 / 1q21.3)
EVI1 (MECOM) Breakapart (3q26.2)
Del(7)(q22q31)
AML1 (RUNX1) Breakapart (21q22.1)

Follicular Lymphoma Panel
BCL6 Breakapart (3q27.3-q28)
MYC Breakapart probe (8q24.21)
IGH Breakapart (14q32.3)
IGH-BCL2: t(14;18)(q32.3;q21.33)
If MYC BA positive
IGK Breakapart (2p11.2)
IGL Breakapart (22q11.21-q11.23)

Mantel cell lymphoma Panel
BCL6 Breakapart (3q27.3-q28)
MYC Breakapart probe (8q24.21)
P16 (CDKN2A) (9p21.3 / 9q12)
IGH Breakapart (14q32.3)
IGH/CCND1 Plus: t(11;14)(q13.3;32.33)
TP53/17CEN (17p13.1 / 17p11.1)
If MYC BA positive
IGK Breakapart (2p11.2)
IGL Breakapart (22q11.21-q11.23)

Cytogenetics : FISH PANELS (Continued)

MALT Lymphoma Panel
Centromere 3 / 12
IGH Breakapart (14q32.3)
MALT Breakapart (18q21.31-q21.32)

MDS Panel
Centromere X / Y
EVI1 (MECOM) Breakapart (3q26.2)
Del(5q)
Del(7)(q22q31)
Centromere 8 / 9
ETV6 Breakapart (12p13.2)
TP53/17CEN (17p13.1 / 17p11.1)
Del(20q)

Multiple Myeloma Panel
CKS1B/CDKN2C (1p32.3 / 1q21.3)
5p15/9q22/15q22
MYC Breakapart probe (8q24.21)
TP53/17CEN (17p13.1 / 17p11.1)
IGH Breakapart (14q32.3)
IGH-FGFR3: t(4;14)
IGH-MYEOV : t(11;14)
IGH-MAF plus : t(14;16)
If IGH BA positive
IGH-CCND3: t(6;14)
IGH-MAFB : t(14;20)
IGH-cMyc: t(8;14) (only if MYC Rearr.)

MF-Panel
EVI1 (MECOM) Breakapart (3q26.2)
Del(7)(q22q31)
TEL/AML1 (ETV6/RUNX1): t(12,21)(q13.2;q22.1)
TP53/17CEN (17p13.1 / 17p11.1)

MPAL-Panel
EVI1 (MECOM) Breakapart (3q26.2)
DEK-NUP214: t(6;9)(p23;q11)
RUNX1/RUNX1T1: t(8;21)(q21.3;q22.1)
MYC Breakapart probe (8q24.21)
BCR/ABL1/ASS1: t(9;22)(q34.1;q11.22)
MLL (KMT2A) Breakapart (11q23.3)
ETV6 Breakapart (12p13.2)
IGH Breakapart (14q32.3)
PML/RARA: t(15;17)(q24.1;q21.1)
CBFB/MYH11 : t(16 ;16)(q22 ;q13.1)

MPN Panel
PDGFRA Breakapart (4q12)
PDGFRB Breakapart (5q32)
BCR/ABL1/ASS1: t(9;22)(q34.1;q11.22)

M. Waldenstroem Panel
Centromere 3 / Centromere 4
MYB/CCND3/SEC63 (6p21.1 / 6q21 / 6q23.3)
MYC Breakapart probe (8q24.21)
ATM (11p11.1-q11.1 / 11q22.3)
RB1/DLEU/LAMP (13q14.2 / 13q14.2 /13q34)
IGH Breakapart (14q32.3)
TP53/17CEN (17p13.1 / 17p11.1)
Centromere 12 / 18

Nodal/Splenic Marginal Z.L
Centromere 13 / 12
BCL6 Breakapart (3q27.3-q28)
Del(7)(q22q31)
IGH Breakapart (14q32.3)
MALT1 (18q21.31-q21.32)

sec AML Panel
EVI1 (MECOM) Breakapart (3q26.2)
Del(5q)
Del(7)(q22q31)
Centromere 8, 9
MLL (KMT2A) Breakapart (11q23.3)
TP53/17CEN (17p13.1 / 17p11.1)

Sezary Panel
ATM (11p11.1-q11.1 / 11q22.3)
RB1/DLEU/LAMP (13q14.2 / 13q14.2 /13q34)
TCRAD Breakapart (14q11.2)
TP53/17CEN (17p13.1 / 17p11.1)

T-ALL Panel
STIL/TAL1 (1p33)
TLX3 Breakapart (5q35.1)
MYB/CCND3/SEC63 (6p21.1 / 6q21 / 6q23.3)
TCRB Breakapart (7q34)
MYC Breakapart probe (8q24.21)
P16 (CDKN2A) (9p21.3 / 9q12)
TLX1 Breakapart (10q24.31)
MLL (KMT2A) Breakapart (11q23.3)
TCRAD Breakapart (14q11.2)

Haptosplenic T-cell Lymphoma Panel
Del(7)(q22q31)
Centromere 8 / 12

T-NHL Panel
ATM (11p11.1-q11.1 / 11q22.3)
RB1/DLEU/LAMP (13q14.2 / 13q14.2 /13q34)
TCRAD Breakapart (14q11.2)

T NK/LGL Leukemia Panel
MYB/CCND3/SEC63 (6p21.1 / 6q21 / 6q23.3)
Del(7)(q22q31)
Centromere 8 / 9
ATM (11p11.1-q11.1 / 11q22.3)
MLL (KMT2A) Breakapart (11q23.3)
RB1/DLEU/LAMP (13q14.2 / 13q14.2 /13q34)
TP53/17CEN (17p13.1 / 17p11.1)

T-cell prolymphocytic Leukemia Panel
MYC Breakapart probe (8q24.21)
ATM (11p11.1-q11.1 / 11q22.3)
TCRAD Breakapart (14q11.2)
TP53/17CEN (17p13.1 / 17p11.1)

Molecular Genetic Panels	
Chronic Myeloid Leukemia (CML) Multigene fusion screen at diagnosis BCR::ABL1 follow-up (p210) BCR::ABL1 follow-up (other transcript) TKI resistance: BCR::ABL1 mutation search **Chronic Neutrophilic Leukemia (CNL)** CSF3R Essential Thrombocythemia (ET) / Myelofibrosis (MF) / Polycythemia Vera (PV) JAK2 V617F mutation JAK2 V617F quantitative LOD 1% - possibility for LOD 0.01% CALR, MPL, JAK2 exon 12 (if JAK2-neg) Extended clonality panel (triple-negative) Prognostic panels (WHO-recommended): ET: EZH2, IDH2, SF3B1, SH2B3, TP53, U2AF1 MF (MIPSS70+): ASXL1, EZH2, SRSF2, IDH1/2, U2AF1 PV: ASXL1, IDH2, SRSF2 **Mastocytosis (SM)** KIT D816V (qPCR) LOD 1% - possibility for LOD 0.01% Rare KIT mutations SM panel: ASXL1, CBL, EZH2, JAK2, KIT, KRAS, NRAS, RUNX1, SRSF2, TET2, U2AF1 **Myeloid/Lymphoid Neoplasms with Eosinophilia, HES, CEL** Comprehensive myeloid panel PDGFRA/B (incl. PCR screen) T-cell clonality (TCRG, TCRB) **MDS / MPN Overlap** CMML diagnostic/prognostic panel (ELN 2022, WHO 2022, CPSS-mol) aCML: ASXL1, CBL, CSF3R, ETNK1, SETBP1, SRSF2 **Myelodysplastic Syndrome (MDS)** IPSS-M panel Urgent markers for MDS-IB2: IDH1/2, FLT3 **Acute Myeloid Leukemia (AML)** Urgent: IDH1/2, FLT3, NPM1 Diagnostic/prognostic NGS (ELN 2022): ASXL1, BCOR, CEBPA, EZH2, FLT3, NPM1, RUNX1, SF3B1, SRSF2, STAG2, TP53, U2AF1, ZRSR2 Follow-up panels: NPM1 quantitative WT1, MECOM quantitative FLT3-ITD/TKD MRD Other MRD targets (specify), depends on target Fusion Gene Panels Multigene fusion screen PML::RARA (qPCR) RUNX1::RUNX1T1 (qPCR) CBFB::MYH11 (qPCR)	**Acute Lymphoblastic Leukemia (ALL)** Multigene fusion screen BCR::ABL1 follow-up (p210 & others) IGH/TCR marker setup (diagnosis & follow-up) BCR::ABL1 mutation (TKI resistance) IKZF1 deletions (MLPA, Ph-like) ALL NGS panel **Chronic Lymphocytic Leukemia (CLL)** IGHV mutation status TP53 mutation Ibrutinib resistance: BTK, PLCG2 **Other B-Cell Neoplasms** B-cell clonality NGS for unclear B-cell neoplasms HCL: BRAF V600E MM/MGUS (CD138+): BRAF, TP53, NRAS, KRAS, MYD88 SMZL: NOTCH1, NOTCH2, FBXW7, KLF2, TP53 Mantle Cell Lymphoma: TP53, CCND1, UBR5, ATM DLBCL: MYD88, CD79B, NOTCH1/2, EZH2, TET2, BCL2 Follicular Lymphoma: ARID1A, CREBBP, CARD11, EP300, EZH2, FOXO1, MEF2B Waldenström/LPL/IgM-MGUS: MYD88, CXCR4 **Aplastic Anemia / PNH** PIGA, BCOR, BCORL1, ASXL1, DNMT3A, CSMD1, JAK2, JAK3, RUNX1, STAT3, TP53 **VEXAS Syndrome** UBA1 **T/NK-Cell Neoplasms** T-cell clonality T-LGLL: STAT3, STAT5B NK-LGLL: STAT3, CCL22 NGS panel for unclear T/NK cases Histiocytoses BRAF V600E MAPK1 mutations Other **Chimerism STR Analysis** Pre-allogeneic HSCT Post-allogeneic HSCT HLA typing (donor & recipient) Constitutive Molecular Genetics (Hereditary) Hereditary myeloid neoplasia / bone marrow failure:CEBPA, DDX41, RUNX1, ANKRD26, ETV6, GATA2, SRP72, TET2 Sideroblastic anemia (XLSA): ALAS2 Hereditary thrombocytosis/erythrocytosis: THPO, MPL, EPOR, VHL, EGLN1, EPAS1, SH2B3 Hereditary Alpha-Tryptasemia: TPSAB1