

FISH Probes

MULTICOLOR DNA PROBE PANELS

Fluorescent *in situ* Hybridization (FISH) is a cytogenetic diagnostic technique that utilizes DNA fragments labeled with a fluorescent tag to highlight the location, presence, or rearrangement of genetic loci. FISH probes enable clinicians & researchers to accurately determine a specific genetic abnormality. The revelation of an abnormality can answer key questions in disease diagnosis, prognosis, and enable the selection of the ideal treatment. FISH probes also aid in drug development and biomarker validation.

Empire Genomics can create custom probes using our full RP-11 library. Below is a sampling of gene-specific probes that we currently offer. If a gene you are interested in is not listed, let us know, we can design a probe to hybridize to any human gene!

Hematopathology

Acute Lymphoblastic Leukemia (Adult) MYB/Con 6 (6q23.3 del) ABL1 (9q34.1) BCR/ABL t(9;22) BCR/ABL/ASS1 (9;22) PAX5 (9p13.2) CDKN2A (9p21.3) JAK2 (9p24.1) KMT2A (11q23) EPOR (19p13.2) IGH (14q32)	Acute Myeloid Leukemia MECOM (3q26.2) TERT (5p15.3) CBFβ (16q22.1) MYB (6q23.3) RREB1 (6p24.3) NCOA2 (8q13.3) WT1 (11p13) KMT2A (11q23)	Chronic Myelogenous Leukemia (CML) BCR/ABL1 t(9;22) BCR/ABL1/ASS1 t(9;22) ABL1 (9q34.1)	Mantle Cell Lymphoma (MCL) BIRC3 (11q22.2) CCND1/IGH t(11;14) IGH (14q32)	Myeloproliferative Neoplasms (MPN) 5p5q (5q31 del) PDGFRβ (5q32) Con 7 / 7q (7q21 del) Con 8 (trisomy 8) Con 9 (trisomy 9) RB1 (13q14.2 del) 20q- (20q12 del)
Acute Lymphoblastic Leukemia (Pediatric) ABL1 (9q34.1) BCR/ABL t(9;22) IGH (14q32) ETV6/RUNX1 t(12;21) KMT2A (11q23)	Acute Myelomonocytic Leukemia MECOM (3q26.2) Del 20p20q	Follicular Lymphoma IGH/BCL2 t(14;18)	Multiple Myeloma CDKN2C/CKS1B (1p1q) FGFR3 (4p16.3) BIRC3 (11q22.2) RB1 (13q14.2) IGH (14q32) MAF (16q23.2) TP53 (17p13.1) CIC (19q13.2) BRD4 (19p13.1) Con 7, 9, 11, 17	NUT Midline Carcinoma NUTM1/BRD4 (15;19)
Acute Myelogenous Leukemia MECOM (3q26.2) KIT (4q12) DEK/NUP214 (6;9) FGFR1 (8p11.2) RUNX1T1/RUNX1 t(8;21) BCR/ABL/ASS1 t(9;22) PML/RARA t(15;17) CBFβ inv(16)	Acute Promyelocytic Leukemia CHEK1 (11q24.2) PML/RARA t(15;17) RARA (17q21.2)	Large B-Cell Lymphoma (LBCL) BCL6 (3q27.3) BCL2 (18q21.3)	Lymphoma ALK (2p23) BCL6 (3q27.3) DUSP22 (6p25.3) TCRG (7p14) MYC (8q24.2) PD-L1 (9p24.1) MALAT1 (11q13.1) MYC/IGH t(8;14) CCND1/IGH t(11;14) IGH/BCL2 t(14;18) IGH (14q32) BCL2 (18q21.3) NFKB2 (10q24.3)	T-Cell Leukemia / Lymphoma FGFR3 (4p16.3) Isochromosome 7q FGFR1 (8p11.2) TRA (14q11.2)
	Burkitt Lymphoma IGH/MYC/Con 8 t(8;14) MYC (8q24.2) MYC/IGH t(8;14)	MALT Lymphoma IGH (14q32) MALT1 (18q21.3) BCL2 (18q21.3)	Myelodysplastic Syndrome (MDS) 5p5q (5q31 del) Con 7 / 7q (7q31 del) Con 8 (trisomy 8) Con 9 (trisomy 9) KMT2A (11q23) 20q- (20q12 del)	Myeloid Neoplasms with Eosinophilia PDGFRA/CHIC2/FIP1L1 PDGFRβ (5q32) FGFR1 (8p11.2)

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Solid Tumor Pathology

Alveolar Rhabdomyosarcoma
PAX7 (1p36.1)
CCND1 (11q13.3)
CDK4 (12q14.1)
FOXO1 (13q14.1)

Aneurysmal Cyst/ Nodular Fasciitis
USP6 (17p13.2)

Bladder Cancer
PD-L1 (9p24.1)
FGFR3 (4p16.3)
PDGFRB (5q32)
RREB1 (6p24.3)
TP63 (3q28)
FGFR1 (8p11.2)
P16 (9p21)
FGFR2 (10q26.1)
KIT (4q12)
CDK4 (12q14.1)
CDKN2D (19p13.2)

Breast Cancer
REL (2p16.1)
CREB1 (2q33.3)
WWTR1 (3q25.1)
TERT (5p15.3)
PHF1 (6q21.3)
MYB (6q23.3)
NCF1 (7q11.2)
MET (7q31.2)
FGFR1 (8p11.2)
NRG1 (8p12)
NCOA2 (8q13.3)
PREX2 (8q13.2)
PTEN (10q23.3)
NFKB2 (10q24.3)
FGFR2 (10q26.1)
CCND1 (11q13.3)
BIRC3 (11q22.2)
CHEK1 (11q24.2)
CDK4 (12q14.1)
HMGA2 (12q14.3)
NTRK3 (15q25)
MAF (16q23.2)
Con 17
HER2 (17q12)
TOP2A (17q21.2)
BCL2 (18q21.3)
CIC (19q13.2)
ZNF217 (20q13.2)
PDGFB (22q13.1)
XIST (Xq13.2)

Cervical Cancer
WWTR1 (3q25.1)
PDGFRA (4q12)
MYB (6q23.3)
MET (7q31.2)
MAML2 (11q21)
YY1 (14q32.2)
BCL2 (18q21.3)

Colorectal Cancer
PD-L1 (9p24.1)
WWTR1 (3q25.1)
PHF1 (6p21.3)
NCF1 (7q11.2)
MET (7q31.2)
PREX2 (8q13.2)
CHEK1 (11q24.2)
ZNF217 (20q13.2)

Ewing Sarcoma
EWSR1 (22q12.2)

Fibrosarcoma
COL1A1/PDGFB (17;22)

GIST
KIT (4q12)
PDGFRA (4q12)
BRAF (7q34)
KRAS (12p12.1)
YWHAE (17p13.3)
ZNF217 (20q13.2)

Glioma
1p19q
TERT (5p15.3)
PDGFRB (5q32)
ROS1 (6q22.1)
SMARCB1 (22q11.2)
PDGFB (22q13.1)

Liver Cancer
TERT (5p15.3)
PHF1 (6p21.3)
NCF1 (7q11.2)
MET (7q31.2)
PREX2 (8q13.2)
YWHAE (17p13.3)

Lung Cancer
NTRK1 (1q23.1)
EML4/ALK (2;2)
ALK (2p23)
CREB1 (2q33.3)
VHL (3p25.3)
WWTR1 (3q25.1)
PIK3CA (3q26.3)
TP63 (3q28)
FGFR3 (4p16.3)
PDGFRA (4q12)
KIT (4q12)
VEGFR2 (4q12)
TERT (5p15.3)
CD74/ROS1 (5;6)
NPM1 (5q35.1)
GOPC (6q22.1)
PHF1 (6p21.3)
ROS1 (6q22.1)
EGFR (7p11.2)
NCF1 (7q11.2)
MET (7q31.2)
BRAF (7q34)
FGFR1 (8p11.2)
PREX2 (8q13.2)
PD-L1 (9p24.1)
PD-L2 (9p24.1)
KIF5B/RET (10;10)
PTEN (10q23.3)
RET (10q11.2)
FGFR2 (10q26.1)
WT1 (11p13)
MAML2 (11q21)
CCND1 (11q13.3)
KRAS (12p12.1)
CDK4 (12q14.1)
HMGA2 (12q14.3)
AKT1 (14q32.3)
HER2 (17q12)
BCL2 (18q21.3)
TFE3 (Xp11.2)

Melanoma
PAX3 (2q36.1)
KIT (4q12)
TERT (5p15.3)
RREB1 (6p24.3)
MAGI2 (7q21.1)
PREX2 (8q13.2)
PD-L1 (9p24.1)
CDK4 (12q14.1)
BCL2 (18q21.3)

Myxoid Liposarcoma
DDIT3 (12q13.3)
CDK2 (12q14.1)
HMGA2 (12q14.3)

Neuroblastoma
NTRK1 (1q23.1)
MYCN (2p24.3)
NTRK3 (15q25.3)

Ovarian Cancer
GOPC (6q22.1)
WT1 (11p13)
CHEK1 (11q24.2)
HMGA2 (12q14.3)
CDKN2D (19p13.2)
ZNF217 (20q13.2)
XIST (Xq13.2)

Prostate Cancer
HPC1 (1q25.3)
CENPF (1q41)
CREB1 (2q33.3)
ETV5 (3q27.2)
PHF1 (6p21.3)
ETV1 (7p21.2)
MAGI2 (7q21.2)
MET (7q31.2)
NCF1 (7q11.2)
PREX2 (8q13.2)
NCOA2 (8q13.3)
MSR1 (8p22)
HGF (7q21.1)
ETV6/RUNX1 (12;21)
FOXM1/CENPF (12;1)
MAF (16q23.2)
YES1 (18p11.3)
ELAC2 (17p12)
BCL2 (18q21.3)
ERG (21q22.2)
TMPRSS2 (21q22.3)
ERG (22q22.2)

Renal Cell Carcinoma
MTOR (1p36.2)
VHL (3p25.3)
TFEB (6p21.2)
TFE3 (Xp11.23)
MET (7q31.2)
PD-L1 (9p24.1)
HIF1A (14q23.2)
FLCN (17p11.2)
YWHAE (17p13.3)
SMARCB1 (22q11.2)

Retinoblastoma
RB1 (13q14.2)

Round Cell Carcinoma
WT1/EWSR1 (22;22)
CIC (19q13.2)

Skin Cancer
KIT (4q12)
PDGFRA (4q12)
RREB1 (6p24.3)
JAK2 (9p24.1)
CDK4 (12q14.1)
SMARCB1 (22q11.2)
PDGFB (22q13.1)

Smooth Muscle Tumors
HMGA2 (12q14.3)

Stomach Cancer
PDGFRA (4q12)
MET (7q31.2)
JAK2 (9p24.1)
YWHAE (17p13.3)
NTRK3 (15q25.3)
ZNF217 (20q13.2)

Synovial Sarcoma
SS18 (18q11.2)

Testicular Cancer
PDGFRA (4q12)
CDK4 (12q14.1)
CDKN2D (19p13.2)
XIST (Xq13.2)

Thyroid Cancer
NTRK1 (1q23.1)
PDGFRA (4q12)
PAX8/PPARG (2;3)
KIT (4q12)

Uterine Cancer
KIT (4q12)
MYB (6q23.3)
BIRC3 (11q22.2)
YWHAE (17p13.3)
ERBB2 (17q12)
BCL2 (18q21.3)
XIST (Xq13.2)

Vascular Tumors
CAMTA1/WWTR1 (1;3)

Wilms Tumor
WT1 (11p13)
NTRK3 (15q25.3)
HMGA2 (12q14.3)
SMARCB1 (22q11.2)

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