FISH Probes for Pediatric Cancer Research

Advancing Genomic Insights in Childhood Cancers

Fluorescence in situ hybridization (FISH) is a powerful tool in pediatric cancer research, enabling scientists and investigators to study chromosomal alterations that are frequently associated with disease development and progression. Empire Genomics offers a comprehensive portfolio of high-quality RUO (Research Use Only) and ASR (Analyte Specific Reagents) FISH probes designed to support investigations into key genomic biomarkers in pediatric oncology including: **Acute Lymphoblastic Leukemia (ALL), Ewing Sarcoma, Rhabdomyosarcoma, Burkitt Lymphoma.**

These cancers frequently involve hallmark genomic alterations that FISH can help visualize at the single-cell level, offering critical insight into tumor biology, progression, and genetic heterogeneity.

Acute Lymphoblastic Leukemia (ALL)

ALL is the most common pediatric cancer, often characterized by specific chromosomal translocations and gene fusions. FISH is widely used in research to study recurrent alterations such as ETV6-RUNX1, TCF3-PBX1, BCR-ABL1, and KMT2A rearrangements, which are central to understanding disease subtypes and progression.

Probe Name	Catalog Number	Test Count
PBX1/TCF3 FISH Probe	PBX1-TCF3-20-OG-R	20
Control 4/10/17 FISH Probe	CHR04-CHR10-CHR17-10-GRA-R	10
MYC Break Apart vB FISH Probe	MYCBA-VB-20-OG-R	20
BCR/ABL1 FISH Probe	BCR-ABL1-20-GO-R	20
BCR/ABL1/ASS1 FISH Probe	BCR-ABL1-ASS1-20-GOA-R	20
MLL Break Apart Extended FISH Probe	MLLBA-EXT-20-GO-R	20
IGH Break Apart vC FISH Probe	IGHBA-VC-20-OG-R	20
P16 FISH Probe	P16-20-O-R	20
ETV6/RUNX1 FISH Probe	ETV6-RUNX1-20-GO-R	20

Ewing Sarcoma

Ewing sarcoma is a highly aggressive bone and soft tissue tumor most commonly affecting children and adolescents. A defining molecular feature is the presence of chromosomal translocations involving the EWSR1 gene. These translocations result in fusion genes—most often EWSR1-FLI1—that play a key role in tumor development. FISH is widely used in research settings to visualize EWSR1 rearrangements and to explore their significance in disease biology and treatment response.

Probe Name	Catalog Number	Test Count
EWSR1 Break Apart FISH Probe	EWSR1BA-20-OG-R	20
EWSR1 Break Apart/FLI1 FISH Probe	EWSR1BA-FLI1-20-OGA-R	20

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Rhabdomyosarcoma

Rhabdomyosarcoma (RMS) is the most common soft tissue sarcoma in children. The alveolar subtype is frequently associated with gene fusions involving FOXO1 and either PAX3 or PAX7. These fusion events result from characteristic chromosomal translocations and are of particular interest in research focused on tumor classification, molecular signaling, and prognosis. FISH provides a reliable method to investigate these fusions in RMS research studies.

Probe Name	Catalog Number	Test Count
FOXO1/PAX3 FISH Probe	FOXO1-PAX3-20-OG-R	20
FOXO1/PAX7 FISH Probe	FOXO1-PAX7-20-OG-R	20

Burkitt Lymphoma

Burkitt lymphoma is a fast-growing B-cell non-Hodgkin lymphoma often seen in pediatric populations. A hallmark of this disease is the deregulation of the MYC oncogene due to chromosomal translocations, most commonly t(8;14), involving MYC and the IGH gene. FISH is a valuable research tool for visualizing these rearrangements and investigating their role in lymphoma pathogenesis.

Probe Name	Catalog Number	Test Count
MYC Break Apart vB FISH Probe	MYCBA-VB-20-OG-R	20
MYC/IGH Split FISH Probe	MYC-IGH-SPLIT-20-OG-R	20

References: Pui C-H, *et al.* N Engl J Med. 2008;359(15):1535–1548. Hunger SP, Mullighan CG. N Engl J Med. 2015;373:1541–1552. Grünewald TG, *et al.* Nat Rev Dis Primers. 2018;4:5. Skapek SX, *et al.* J Clin Oncol. 2019;37(16):1449–1459. Swerdlow SH, *et al.* WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues, 4th ed. IARC; 2017.

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