







Fusions occur when two normally separated genes are joined, which can contribute to cancer development in a few different ways. The translocated gene may fuse to a promoter, ramping up expression of the gene. This is the means by which many transcription factor genes become oncogenic, such as when MYC fuses with promoters IGH, IGK and IGL in Burkitt Lymphoma. The genes can also fuse to create a chimeric gene that produces a novel hybrid protein with oncogenic potential. This occurs in the well-known BCR-ABL1 fusion; the two genes together code for a protein with abnormal tyrosine kinase activity in chronic myeloid leukemia. Lastly, a fusion can cause tumorigenesis when it results in the truncation and consequent inactivation of a tumor suppressor gene.¹

Gene fusions occur with varying frequency among different cancer types; for example, they're found in 90% of lymphomas, over half of all leukemias, and one third of soft tissue tumors, but are rare to absent in other malignancies². Some fusions are specific to certain cancers, and can provide important clues about the identity and nature of the malignancy during diagnosis and prognosis. Fusion-targeted inhibitors have proven potent treatment options for patients with fusion-positive tumors, with second generation inhibitors currently in trial.

Browse our extensive list of over 17,000 fusion probes, or, if we don't have what you're looking for, create a custom gene fusion FISH probe. Fusion probes contain 2 colors that are designed to hybridize to their respective genes. A cell that has a fusion of the genes will show the signals less than one signal width apart. Each kit contains 20 tests and normally ships within 7-10 business days.

FUSION PROBES	LOCATION / STS	DYE COLOR	SKU
ALK/EML4	2p21/2p23		ALK-EML4-20-ORGR
BCR/ABL1	22q11.23/9q34.12		BCR-ABL1-20-GROR
CCND1/IGH	11q13.3/14q32.33		CCND1-IGH-20-ORGR
DEK/NUP214	6p22/9q34		DEK-NUP214-20-GROR
ETV6/NTRK3	12p13.2/15q25.3		ETV6-NTRK3-20-GROR
ETV6/PAX3	12p13.2/2q36.1		ETV6-PAX3-20-GROR
ETV6/RUNX2	12p13.2/21q22.1		ETV6-RUNX-20-GROR
FGFR3/IGH	4p16.3/14q32.33		FGFR3-IGH-20-ORGR
IGH/MAF	14q32.33/16q23.2		IGH-MAF-20-GROR
IGH/MYC	14q32.33/8q24.21		IGH-MYC-20-GROR
PML/RARA	15q24/17q21.1		PML-RARA-20-ORGR
RUNX1/RUNX1T1	21q22.1/8q21.3		RUNX1-RUNX1T1-20-ORGR

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1. Mertens, F., Johansson, B., Fioretos, T., & Mitelman, F. (2015). The emerging complexity of gene fusions in cancer. *Nature Reviews Cancer*, 15(6), 371–381. doi:10.1038/nrc3947

2. Latysheva, Natasha S., and M. Madan Babu. "Discovering and understanding oncogenic gene fusions through data intensive computational approaches." *Nucleic acids research* 44.10 (2016): 4487-4503.