
Product Data Sheet

21q22 (ERG-BA) FISH Probe

Catalog#'s: F-ERG-Proximal (Red), F-ERG-Distal (Green)

Gene Information:

The ERG oncogene is a member of the erythroblast transformation-specific (ETS) family of transcription factors regulating embryonic development, cell proliferation, differentiation, angiogenesis, inflammation, and apoptosis. ERG overexpression is observed in many cancers. Mechanisms of over expression include copy number increases in the ERG gene, or upregulation of ERG gene expression due to fusion with androgen-responsive promoters. To date, all known ERG fusion partners are androgen regulated genes. The most common ERG fusion partner is the TMPRSS2 gene (Edel).

Clinical Relevance:

Prostate Cancer: ERG over expression is an early event in prostate oncogenesis. Attard *etal.* have shown that TMPRSS2:ERG fusion (Edel) in conjunction with a copy number increase (2+Edel) is associated with poor disease specific survival in men undergoing initial active surveillance in localized prostate cancer, as well as a high likelihood for biochemical recurrence in men undergoing radical prostatectomy.¹ Others have shown that ERG gene polysomy was significantly associated with recurrence.² Additional studies have identified three patient groups based on the ERG and PTEN biomarkers: (1) 'poor genomic grade' characterized by both PTEN deletion and TMPRSS2:ERG fusions; (2) 'intermediate genomic grade' with either PTEN deletion or TMPRSS2:ERG fusion, and (3) 'favorable genomic grade' in which neither rearrangement was present.³

Acute Myeloid Leukemia (AML): In AML, ERG function is deregulated due to a fusion with FUS/TLS resulting in the expression of a FUS-ERG fusion protein. Results suggest that FUS-ERG acts as a transcriptional repressor of the retinoic acid signaling pathway.⁴

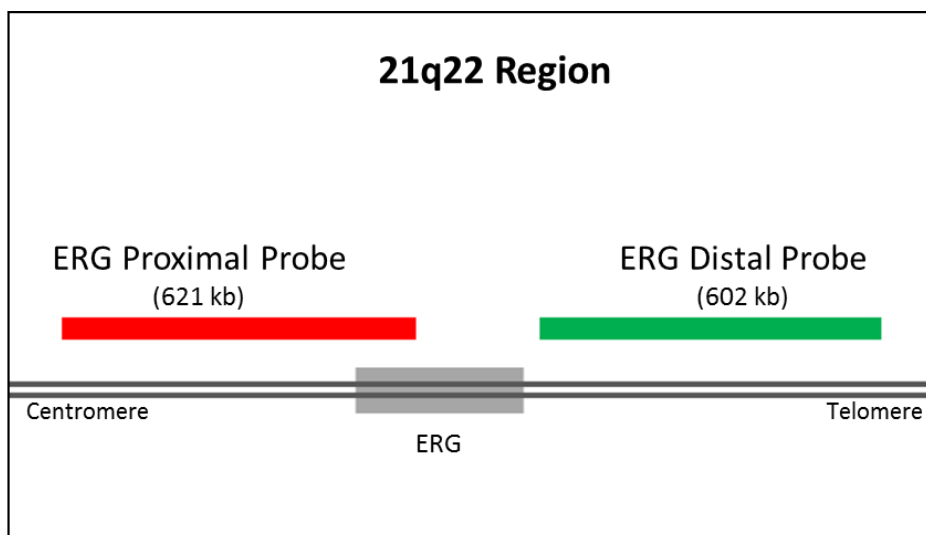
Ewing's Sarcoma: In Ewing's Sarcoma, the EWS gene is fused with various ETS family members. The second most common partner is ERG accounting for 10% of cases. Researches are investigating if there's an association with a more aggressive tumor behavior.⁵

Probe Specifications:

Probe and target gene boundaries are indicated in relation to proximity to the centromere or telomere. Positions are based on UCSC genome assembly GRCh37/hg19.

Locus	Target			Probe			
	Gene	Centromere	Telomere	Probe	Centromere	Telomere	Size (Kb)
21q22	ERG	39,739,183	40,033,704	ERG Proximal	39,224,313	39,845,244	621
				ERG Distal	40,061,346	40,662,849	602

Probe Map:



Product Contents:

All individual or FISH probe cocktails are provided ready to use in hybridization buffer and can be blended with up to 4 total probes. Blocking DNA is included to suppress non-specific binding to similar sequences outside of the indicated binding sites. Researchers are advised to optimize slide processing and hybridization conditions.

Volume: 250µl
 Reactions: 50 (5µl/ reaction)

For Investigational Use Only. The performance characteristics of this product have not been established.

Product Colors:

The ERG-BA probes are designed to yield a yellow color when the ERG gene is not split, and individual red or green signals when split.

Probe	Color	Dye	Absorbance	Emission
ERG-Proximal	Red	Alexa594	590	615
ERG-Distal	Green	Alexa488	495	519

Storage:

Store at -20°C

Protect from direct light.

References:

1. Attard G, Clark J, Ambrosine L, Fisher G, Kovacs G, Flohr P, Berney D, Foster CS, Fletcher A, Gerald WL, Moller H, Reuter V, De Bono JS, Scardino P, Cuzick J, Cooper CS; Transatlantic Prostate Group. Duplication of the fusion of TMPRSS2 to ERG sequences identifies fatal human prostate cancer. *Oncogene*. 2008 Jan 10;27(3):253-63. Epub 2007 Jul 16. PubMed PMID: 17637754; PubMed Central PMCID: PMC2646890.
2. Toubaji A, Albadine R, Meeker AK, Isaacs WB, Lotan T, Haffner MC, Chau A, Epstein JI, Han M, Walsh PC, Partin AW, De Marzo AM, Platz EA, Netto GJ. Increased gene copy number of ERG on chromosome 21 but not TMPRSS2-ERG fusion predicts outcome in prostatic adenocarcinomas. *Mod Pathol*. 2011 Nov;24(11):1511-20. doi: 10.1038/modpathol.2011.111. Epub 2011 Jul 8. PubMed PMID: 21743434; PubMed Central PMCID: PMC3360950.
3. Yoshimoto M, Joshua AM, Cunha IW, Coudry RA, Fonseca FP, Ludkovski O, Zielenska M, Soares FA, Squire JA. Absence of TMPRSS2:ERG fusions and PTEN losses in prostate cancer is associated with a favorable outcome. *Mod Pathol*. 2008 Dec;21(12):1451-60. doi: 10.1038/modpathol.2008.96. Epub 2008 May 23. PubMed PMID: 18500259.
4. Sotoca AM, Prange KH, Reijnders B, Mandoli A, Nguyen LN, Stunnenberg HG, Martens JH. The oncofusion protein FUS-ERG targets key hematopoietic regulators and modulates the all-trans retinoic acid signaling pathway in t(16;21) acute myeloid leukemia. *Oncogene*. 2016 Apr 14;35(15):1965-76. doi: 10.1038/onc.2015.261. Epub 2015 Jul 6. PubMed PMID: 26148230; PubMed Central PMCID: PMC4833872.
5. Burchill SA. Ewing's sarcoma: diagnostic, prognostic, and therapeutic implications of molecular abnormalities. *J Clin Pathol*. 2003 Feb;56(2):96-102. Review. PubMed PMID: 12560386; PubMed Central PMCID: PMC1769883.