

TMPRSS2/ ERG del-TECT Four Color

FISH Probe
902-7049-102517

BIOCARE
M E D I C A L

Catalog Number: PFR7049A

Description: TMPRSS2/ ERG del-TECT Four Color FISH Probe

Dilution: Ready-to-use

Volume: 100 µL

Intended Use:

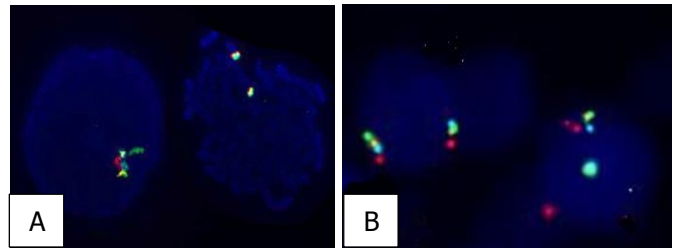
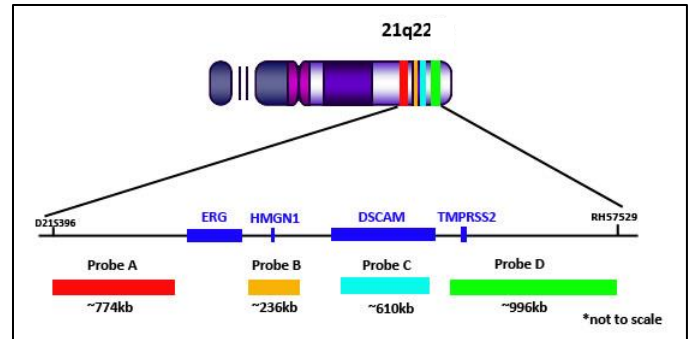
For Research Use Only. Not for use in diagnostic procedures.

Summary and Explanation:

TMPRSS2-ERG rearrangement occurs in approximately 50% of prostate cancers and is associated with an aggressive phenotype^{1, 2}. Both the TMPRSS2 and ERG genes reside on chromosome 21, and gene rearrangements involving the TMPRSS2 and ERG genes lead to the formation of a TMPRSS2-ERG gene fusion product^{1, 2}. ERG is the most commonly overexpressed proto-oncogene in prostate cancer¹. TMPRSS2 is an androgen regulated gene, whose androgen response elements are believed to regulate ERG gene overexpression in TMPRSS2-ERG fusion positive samples³. It has been well documented that TMPRSS2-ERG gene fusion is the result of the 5' untranslated region of the TMPRSS2 gene (21q22) fusing with the 3' coding region of the ERG gene (21q22)⁴. Conventional cytogenetic testing utilizing fluorescence in situ hybridization (FISH) is considered the gold standard in detecting gene fusion rearrangements⁴. The TMPRSS2/ ERG del-TECT (4 Color) FISH probe detects the gene fusion between the TMPRSS2 and ERG genes. Moreover, the novel multi-probe design allows for the detection of microdeletions that occur between the TMPRSS2 and ERG genes, which are associated with gene fusion events on chromosome 21⁵.

Principle of Procedure:

To identify gene rearrangements on chromosome 21 involving the TMPRSS2 and ERG gene the following 4 color FISH probe set can be used. The red probe spans the 3' region of the ERG gene. The orange probe spans the 5' region of the ERG gene and encompasses the HMG1 gene. The TMPRSS2 gene is labeled with the green probe, and resides telomerically to aqua which spans the DSCAM gene. The following signal patterns can be expected when evaluating TMPRSS2/ERG rearrangements. (1) In a normal cell representing, two red/orange (co-localized) signals, with two blue/green signals in close proximity to one another will be observed. (2) TMPRSS2-ERG rearrangement is indicated by, one red/green (co-localized) signal, with a single orange/blue signal (in close proximity to one another). Two separate signal patterns can be expected following variable size deletions occurring within the 5' region of the ERG gene resulting in TMPRSS2-ERG gene fusion. (3) Deletions spanning the 5' region of the ERG gene results in a TMPRSS2-ERG fusion showing, one red/green (co-localized) signal, with one separate blue signal and the loss of one orange signal. A cell containing a TMPRSS2-ERG fusion, as result of a large deletion spanning the 5' region of the ERG gene, is indicated by (4) one red/green (co-localized) signal, and the loss of both orange and blue signals.



(A) TMPRSS2/ ERG del-TECT (4 Color) FISH probe hybridized on normal blood sample. Interphase and metaphase cellular state are shown. (B) TMPRSS2/ ERG del-TECT (4 Color) FISH probe hybridized on prostate FFPE tissue.

Species Reactivity: Human

Known Application:

Fluorescence In-situ Hybridization (FISH) on formalin-fixed paraffin-embedded (FFPE) tissues.

Supplied As: Probe in hybridization buffer.

Storage and Stability:

Store probe at -20°C and away from light. The product is stable to the expiration date printed on the label, when stored under these conditions. Do not use after expiration date.

Technical Note:

Biocare Medical Four Color FISH probes are optimized to provide the best signal performance using optical filters that can accommodate the excitation/emission wavelengths specified below. Using filters outside these spectral specifications may produce sub-optimal results.

Fluorophore	Excitation (nm)	Emission (nm)
AQUA	434	481
GREEN	498	522
ORANGE	537	556
RED	592	628

Limitations:

This product is provided for Research Use Only (RUO) and is not for use in diagnostic procedures. Suitability for specific applications may vary and it is the responsibility of the end user to determine the appropriate application for its use.

Precaution

1. This product contains formamide and fluorescent dyes that may be hazardous to your health. The SDS is available upon request and is located at <http://biocare.net>.

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2. Specimens, before and after fixation, and all materials exposed to them should be handled as if capable of transmitting infection and disposed of with proper precautions. Never pipette reagents by mouth and avoid contacting the skin and mucous membranes with reagents and specimens. If reagents or specimens come in contact with sensitive areas, wash with copious amounts of water⁶.

Technical Support:

Contact Biocare's Technical Support at 1-800-542-2002 for questions regarding this product

References:

1. Fitzgerald, Liesel M, Ilir Agalliu, Karynn Johnson, Melinda A Miller, Erika M Kwon, Antonio Hurtado-Coll, Ladan Fazli, Ashish B Rajput, Martin E Gleave, Michael E Cox, Elaine A Ostrander, Janet L Stanford, and David G Huntsman. "Association of TMPRSS2-ERG Gene Fusion with Clinical Characteristics and Outcomes: Results from a Population-based Study of Prostate Cancer." *BMC Cancer*: 230.
2. Weier, Christopher, Michael C Haffner, Timothy Mosbrugger, David M Esopi, Jessica Hicks, Qizhi Zheng, Helen Fedor, William B Isaacs, Angelo M De Marzo, William G Nelson, and Srinivasan Yegnasubramanian. "Nucleotide Resolution Analysis of TMPRSS2 and ERG Rearrangements in Prostate Cancer." *Journal of Pathology* (2013): 174-83.
3. Tomlins, Scott A., Bharathi Laxman, Sooryanarayana Varambally, Xuhong Cao, Jindan Yu, Beth E. Helgeson, Qi Cao, John R. Prensner, Mark A. Rubin, Rajal B. Shah, Rohit Mehra, and Arul M. Chinnaiyan. "Role of the TMPRSS2-ERG Gene Fusion in Prostate Cancer." *Neoplasia*: 177-IN9.
4. Fernández-Serra, A., L. Rubio, A. Calatrava, J. Rubio-Briones, R. Salgado, R. Gil-Benso, B. Espinet, Z. García-Casado, and J. A. López-Guerrero. "Molecular Characterization and Clinical Impact of TMPRSS2-ERG Rearrangement on Prostate Cancer: Comparison between FISH and RT-PCR." *BioMed Research International*: 1-10.
5. Yoshimoto, Maisa, Anthony M. Joshua, Susan Chilton-Macneill, Jane Bayani, Shamini Selvarajah, Andrew J. Evans, Maria Zielenska, and Jeremy A. Squire. "Three-Color FISH Analysis of TMPRSS2/ERG Fusions in Prostate Cancer Indicates That Genomic Microdeletion of Chromosome 21 Is Associated with Rearrangement." *Neoplasia* (2006): 465-69.
6. Clinical and Laboratory Standards Institute (CLSI). Protection of Laboratory workers from occupationally Acquired Infections; Approved Guideline-Fourth Edition CLSI document M29-A4 Wayne, PA 2014.



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