

ZytoLight® SPEC ALK/EML4 TriCheck™ Probe

Background

The ZytoLight® SPEC ALK/EML4 TriCheck™ Probe is designed to detect inversions involving the chromosomal region 2p23.1-p23.2 harboring the ALK gene and the chromosomal region 2p21 harboring the EML4 gene. Moreover, using this probe it is possible to discriminate between EML4-ALK inversions and translocations affecting ALK, but not EML4, such as ALK-TFG or ALK-KIF5B translocations.

Inversions in the short arm of chromosome 2 [inv(2)(p21p23)] have been frequently detected in non-small cell lung cancer (NSCLC) and lead to the formation of EML4-ALK fusion transcripts. A few reports also identified EML4-ALK fusion transcripts in breast, gastric, and colorectal cancers. Many different breakpoints affecting ALK and EML4 were identified in these respective inversions.

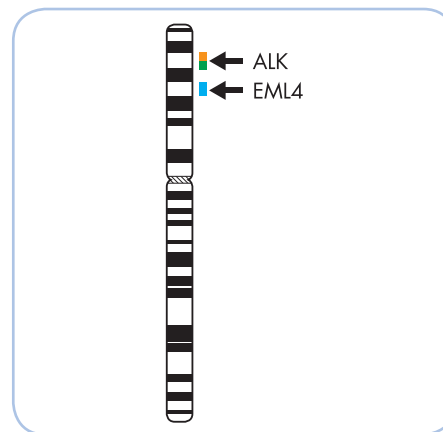
Thus, multiple EML4-ALK transcript variants have been identified, all of which involve the intracellular kinase domain of ALK. ALK kinase targeted therapies may represent a very effective therapeutic strategy in NSCLC patients carrying EML4-ALK rearrangements. For the detection of this subset of NSCLC patients, the specific detection of EML4-ALK rearrangements using Fluorescence *in situ* Hybridization is a helpful tool for diagnosis and for selecting treatment.

References

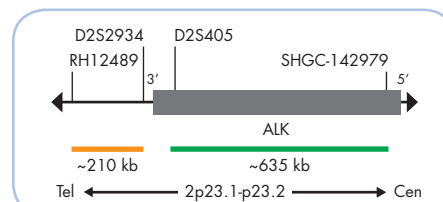
- Inamura K, et al. (2009) *Mod Pathol* 22: 508-15.
- Koivunen JP, et al. (2008) *Clin Cancer Res* 14: 4275-83.
- Lawce HJ & Olson S (2013) *J Assoc Genet Technol* 39: 66-71.
- Martelli MP, et al. (2009) *Am J Pathol* 174: 661-70.
- Perner S, et al. (2008) *Neoplasia* 10: 298-302.
- Preusser M, et al. (2013) *Lung Cancer* 80: 278-83.
- Rodig SJ, et al. (2009) *Clin Cancer Res* 15: 5216-23.
- Sasaki T, et al. (2010) *Eur J Cancer* 46: 1773-80.
- Schildgen V, et al. (2012) *Per Med* 9: 801-3.
- Schildhaus HU, et al. (2013) *Mod Pathol* 26: 1468-77.
- Schoppmann SF, et al. (2013) *Eur J Cancer* 49: 1876-81.
- Thunnissen E, et al. (2012) *Virchows Arch* 461: 245-57.
- Von Laffert M, et al. (2013) *Lung Cancer* 81: 200-6.

Probe Description

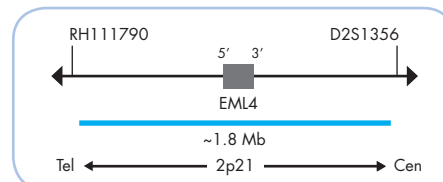
The SPEC ALK/EML4 TriCheck™ Probe is a mixture of three direct labeled probes hybridizing to the short arm of chromosome 2. The orange fluorochrome direct labeled probe hybridizes distal to the ALK gene breakpoint region at 2p23.2, the green fluorochrome direct labeled probe hybridizes proximal to the ALK gene breakpoint region at 2p23.1-p23.2, and the blue fluorochrome direct labeled probe hybridizes to the EML4 gene region at 2p21.



Ideogram of chromosome 2 indicating the hybridization locations.



SPEC ALK Probe map (not to scale).



SPEC EML4 Probe map (not to scale).

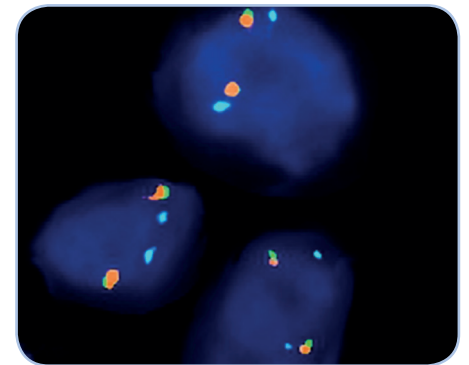
Results

In an interphase nucleus without rearrangement of the EML4-ALK locus, two orange/green fusion signals and two blue signals are expected.

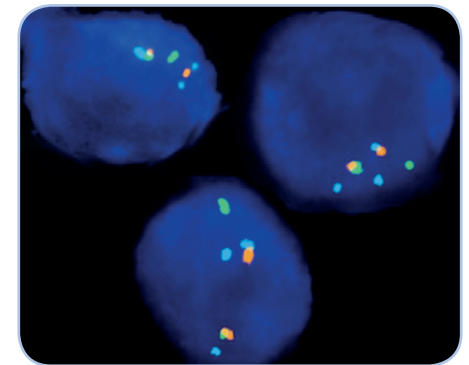
An EML4-ALK inversion is indicated by one separate green signal, one separate orange signal, and an additional blue signal.

An ALK translocation is indicated by separated orange and green signals without an additional blue signal.

EML4-ALK inversion with deletion of 5'-ALK sequences is indicated by loss of one green signal and co-localization of the isolated orange signal with a blue signal.



SPEC ALK/EML4 TriCheck™ Probe on normal interphase cells with non-rearranged ALK loci (two orange/green fusion signals), and non-rearranged EML4 loci (two blue signals).



NSCLC tissue section with an EML4-ALK inversion as indicated by one green, one separated orange, and one additional blue signal.

Prod. No.	Product	Label	Tests* (Volume)
Z-2117-50	ZytoLight SPEC ALK/EML4 TriCheck Probe CE IVD	●/●/●	5 (50 µl)
Z-2117-200	ZytoLight SPEC ALK/EML4 TriCheck Probe CE IVD	●/●/●	20 (200 µl)
Related Products			
Z-2028-5	ZytoLight FISH-Tissue Implementation Kit CE IVD Incl. Heat Pretreatment Solution Citric, 150 ml; Pepsin Solution, 1 ml; Wash Buffer SSC, 150 ml; 25x Wash Buffer A, 50 ml; DAPI/DuraTest-Solution, 0.2 ml		5
Z-2028-20	ZytoLight FISH-Tissue Implementation Kit CE IVD Incl. Heat Pretreatment Solution Citric, 500 ml; Pepsin Solution, 4 ml; Wash Buffer SSC, 500 ml; 25x Wash Buffer A, 100 ml; DAPI/DuraTest-Solution, 0.8 ml		20

* Using 10 µl probe solution per test. CE IVD only available in certain countries. All other countries research use only! Please contact your local dealer for more information.