# ZytoLight® SPEC ALK Dual Color Break Apart Probe

CE IVD

## Background

The ZytoLight® SPEC ALK Dual Color Break Apart Probe is designed to detect rearrangements involving the chromosomal region 2p23.1-p23.2 harboring the ALK (ALK receptor tyrosine kinase, a.k.a. CD246) gene.

ALK encodes a transmembrane receptor tyrosine kinase. This gene exerts characteristic oncogenic activities through fusion to several gene partners or mutations both in hematopoietic and non-hematopoietic solid tumors.

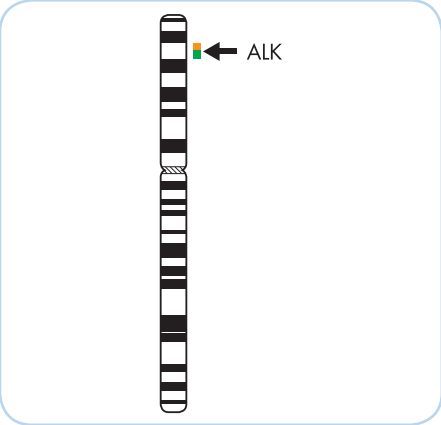
Translocations affecting the ALK gene locus are frequently found in anaplastic large cell lymphoma (ALCL), an aggressive non-Hodgkin lymphoma arising from T-cells. The most frequent translocation t(2;5) results in a fusion with the NPM1 (nucleophosmin a.k.a. nucleolar phosphoprotein B23, numatrin) gene located on chromosome 5q35. This rearrangement results in a NPM1/ALK fusion protein, which is constitutively activated through autophosphorylation, and that in turn mediates malignant cell transformation by activating downstream effectors like e.g. STAT3.

Additionally, inversions affecting the ALK gene located on 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.

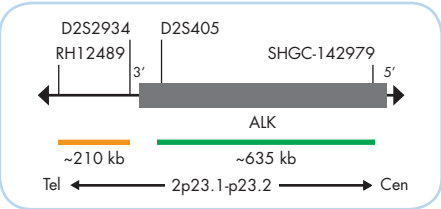
ALK kinase targeted therapies may represent a very effective therapeutic strategy in NSCLC patients carrying EML4-ALK rearrangements.

## Probe Description

The SPEC ALK Dual Color Break Apart Probe is a mixture of two direct labeled probes hybridizing to the 2p23.1-p23.2 band. 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.




*Ideogram of chromosome 2 indicating the hybridization locations.*




*SPEC ALK Probe map (not to scale).*

**References**

Inamura K, et al. (2009) Mod Pathol 22: 508-15.
Koivunen JP, et al. (2008) Clin Cancer Res 14: 4275-83.
Martelli MP, et al. (2009) Am J Pathol 174: 661-70.
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Perner S, et al. (2008) Neoplasia 10: 298-302.
Rodig SJ, et al. (2009) Clin Cancer Res 15: 5216-23.
Sasaki T, et al. (2010) Eur J Cancer 46: 1773-80.
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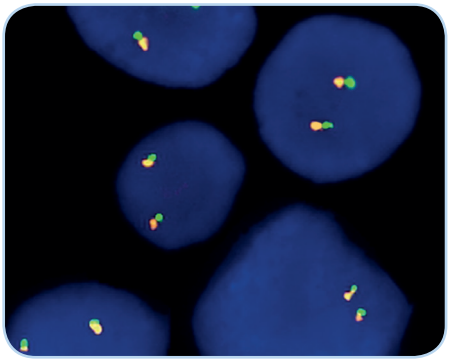
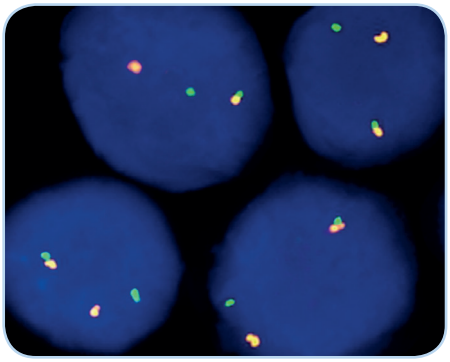
Zhang Q, et al. (2007) Nat Med 11: 1341-8.

## Results

In an interphase nucleus of a normal cell lacking a translocation involving the 2p23.1-p23.2 band, two orange/green fusion signals are expected representing two normal (non-rearranged) 2p23.1-p23.2 loci. A signal pattern consisting of one orange/green fusion signal, one orange signal, and a separate green signal indicates one normal 2p23.1-p23.2 locus and one 2p23.1-p23.2 locus affected by a translocation or inversion. EML4-ALK inversion with deletion of 5'-ALK sequences is indicated by one or multiple isolated orange signals.



*SPEC ALK Dual Color Break Apart Probe hybridized to normal interphase cells as indicated by two orange/green fusion signals per nucleus.*



*Lung carcinoma tissue section with translocation affecting the 2p23 locus as indicated by one orange/green fusion (non-rearranged) signal, one orange signal, and one separate green signal.*

| Prod. No. | Product | Label | Tests* (Volume) |
|---|---|---|---|
| Z-2124-50 | ZytoLight SPEC ALK Dual Color Break Apart Probe CE IVD | ●/● | 5 (50 µl) |
| Z-2124-200 | ZytoLight SPEC ALK Dual Color Break Apart Probe CE IVD | ●/● | 20 (200 µl) |
| **Related Products** | | | |
| Z-2028-5 | ZytoLight FISH-Tissue Implementation Kit CE IVD<br>Incl. Heat Pretreatment Solution Citric, 150 ml; Pepsin Solution, 1 ml; Wash Buffer SSC, 210 ml; 25x Wash Buffer A, 50 ml; DAPI/DuraTect-Solution, 0.2 ml | | 5 |
| Z-2028-20 | ZytoLight FISH-Tissue Implementation Kit CE IVD<br>Incl. Heat Pretreatment Solution Citric, 500 ml; Pepsin Solution, 4 ml; Wash Buffer SSC, 560 ml; 25x Wash Buffer A, 100 ml; DAPI/DuraTect-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.*

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