ZytoLight® SPEC RET Dual Color Break Apart Probe

CE
IVD

Background

The ZytoLight® SPEC RET Dual Color Break Apart Probe is designed to detect translocations involving the chromosomal region 10q11.21 harboring the RET (rearranged during transfection proto-oncogene) gene. RET encodes a tyrosine kinase (TK) receptor. Translocations involving RET were first described in papillary thyroid carcinoma (PTC) where somatic rearrangements result in the fusion of its TK catalytic domain with an N-terminal dimerization domain encoded by various fusion partner genes. More recently, recurrent inversions [inv (10)(p11.2q11.2)] fusing the coiled-coil domains of the kinesin family member 5B (KIF5B) gene to the RET kinase domain have been detected in lung adenocarcinoma. The resulting KIF5B-RET fusion protein can form homodimers through the coiled-coil domains of KIF5B, causing an aberrant activation of the TK of RET, a mechanism known from KIF5B-ALK fusions which is also found in lung adenocarcinoma.

Since in vitro studies showed transforming activity of KIF5B-RET which could be suppressed by a TK inhibitor, it was assumed that the chimeric oncogene might be a promising molecular target for the treatment of lung cancer.

The same holds true for the very recently discovered BCR-RET and FGFR1OP-RET fusion genes in chronic myelomonocytic leukemia (CMML) generated by two balanced translocations t(10;22)(q11.2;q11.2) and t(6;10)(q27;q11.2), respectively.

References
Ballerini P, et al. (2012) Leukemia 26: 2384-9.
Gautschi O, et al. (2013) J Thorac Oncol 8: e43-4.
Ju YS, et al. (2012) Genome Res 22: 436-45.
Kohno T, et al. (2012) Nat Med 18: 375-7.
Lee SE, et al. (2015) Mod Pathol 28: 468-79.
Nikiforov YE (2002) Endocr Pathol 13: 3-16.
Takahashi M, et al. (1985) Cell 42: 581-8.
Takeuchi K, et al. (2012) Nat Med 18: 378-81.

Probe Description

The SPEC RET Dual Color Break Apart Probe is a mixture of two direct labeled probes hybridizing to the 10q11.21 band. The orange fluorochrome direct labeled probe hybridizes proximal to the RET gene, the green fluorochrome direct labeled probe hybridizes distal to that gene.
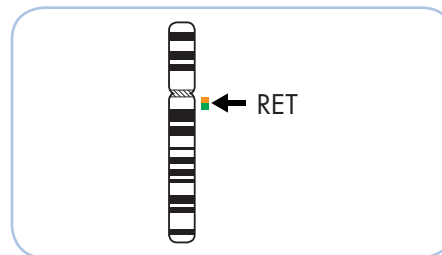

*Ideogram of chromosome 10 indicating the hybridization locations.*
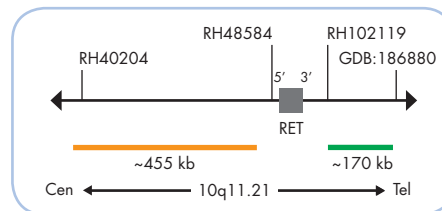
SPEC RET Probe map (not to scale).

Results

In an interphase nucleus lacking a translocation involving the 10q11.21 band, two orange/green fusion signals are expected representing two normal (non-rearranged) 10q11.21 loci. A signal pattern consisting of one orange/green fusion signal, one orange signal, and a separate green signal indicates one normal 10q11.21 locus and one 10q11.21 locus affected by a translocation or inversion.
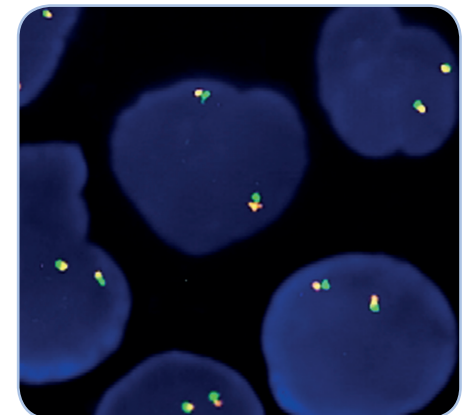
SPEC RET Dual Color Break Apart Probe hybridized to normal interphase cells as indicated by two orange/green fusion signals per nucleus.
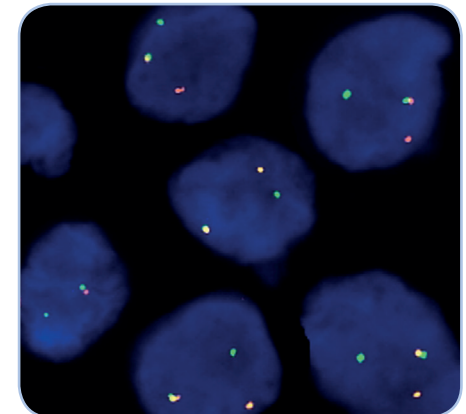
Human thyroid tumor cell line (TPC-1) with translocation affecting the 10q11.21 locus as indicated by one orange/green fusion (non-rearranged) signal, one orange signal, and one separate green signal indicating the translocation.

Prod. No.	Product	Label	Tests* (Volume)
Z-2148-50	ZytoLight SPEC RET Dual Color Break Apart Probe CE IVD	●/●	5 (50 µl)
Z-2148-200	ZytoLight SPEC RET Dual Color Break Apart 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/DuraTect-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/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.