

# ZytoLight® SPEC FOXO1 Dual Color Break Apart Probe

Previously: *ZytoLight SPEC FKHR Dual Color Break Apart Probe*

## Background

The *ZytoLight*® SPEC FOXO1 Dual Color Break Apart Probe is designed for the detection of specific translocations involving the chromosomal region 13q14.11 harboring the FOXO1 (forkhead box O1, a.k.a. FKHR) gene characteristic for alveolar rhabdomyosarcoma.

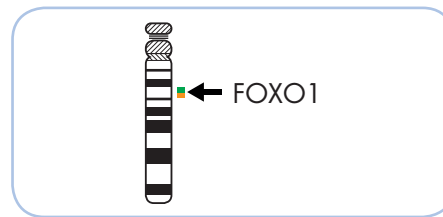
Among solid tumors of the childhood, rhabdomyosarcoma (RMS) is the most common soft tissue sarcoma. RMS are classified in two main categories: embryonal rhabdomyosarcoma (ERMS) and alveolar rhabdomyosarcoma (ARMS). The alveolar histology is associated with a poorer prognosis. ARMS is characterized by two tumor-specific reciprocal translocations  $t(2;13)(q36;q14.1)$  and  $t(1;13)(p36.1;q14.1)$  detectable in more than 80% of all ARMS. These translocations fuse the FOXO1 locus on 13q14.11 to either PAX3 on chromosome 2 or to PAX7 on chromosome 1. The resulting fusion transcripts encode for the chimeric proteins PAX3-FOXO1 and PAX7-FOXO1 that combine transcriptional domains from the corresponding wild-type proteins and thereby acquire oncogenic activity. The translocations and their fusion genes represent highly specific genetic markers useful in the diagnosis of ARMS.

## References

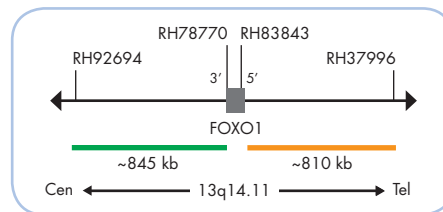
- Dal Cin P, et al. (1991) *Cancer Genet Cytogenet* 55: 191-5.
- Douglass EC, et al. (1991) *Genes Chromosomes Cancer* 3: 480-2.
- Gunawan B, et al. (1999) *Pathol Oncol Res* 5: 211-3.
- Seidal T, et al. (1982) *Acta Pathol Microbiol Immunol Scand A* 90: 345-54.
- Sorensen PH, et al. (2002) *J Clin Oncol* 20: 2672-9.

## Probe Description

The SPEC FOXO1 Dual Color Break Apart Probe is a mixture of two direct labeled probes hybridizing to the 13q14.11 band. The orange fluorochrome direct labeled probe hybridizes distal, the green fluorochrome direct labeled probe hybridizes proximal to the breakpoint region of the FOXO1 gene.



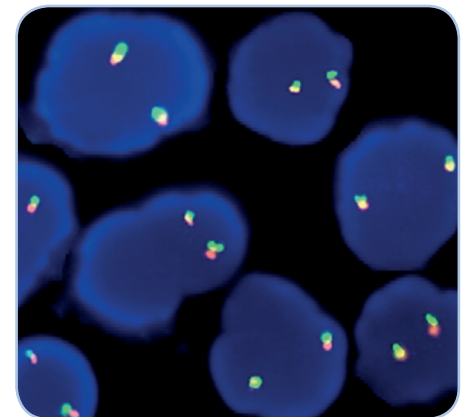
Ideogram of chromosome 13 indicating the hybridization locations.



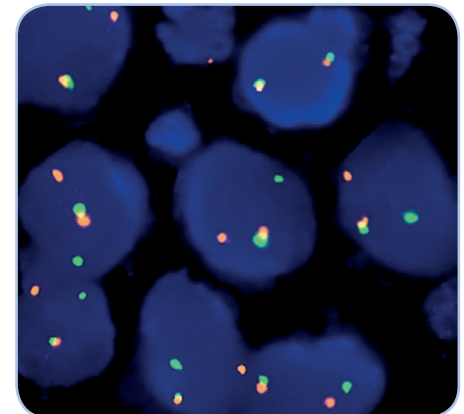
SPEC FOXO1 Probe map (not to scale).

## Results

In an interphase nucleus lacking a translocation involving the 13q14.11 band, two orange/green fusion signals are expected representing two normal (non-rearranged) 13q14.11 loci. A signal pattern consisting of one orange/green fusion signal, one orange signal, and a separate green signal indicates one normal 13q14.11 locus and one 13q14.11 locus affected by a translocation.



SPEC FOXO1 Dual Color Break Apart Probe hybridized to normal interphase cells as indicated by two orange/green fusion signals per nucleus.



Rhabdomyosarcoma tissue section with translocation affecting the 13q14.11 locus harboring FOXO1 as indicated by one orange/green fusion signal (non-rearranged), one orange signal, and one separate green signal indicating the translocation.

Prod. No.	Product	Label	Tests* (Volume)
Z-2139-50	ZytoLight SPEC FOXO1 Dual Color Break Apart Probe CE IVD	●/●	5 (50 µl)
<b>Related Products</b>			
Z-2028-5	ZytoLight FISH-Tissue Implementation Kit CE IVD Incl. Heat Pretreatment Solution Citric, 150 ml; Pepsin Solution, 1ml; Wash Buffer SSC, 150 ml; 25x Wash Buffer A, 50 ml; DAPI/DuraTect-Solution, 0.2 ml		5

\* 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.