ZytoLight® SPEC WT1 Dual Color Break Apart Probe

Intended Purpose

The ZytoLight SPEC WT1 Dual Color Break Apart Probe is designed to detect translocations involving the chromosomal region 11p13 harboring the WT1 (Wilms tumor 1) gene.

The WT1 gene is located on 11p13 and encodes a zinc finger DNA-binding protein that acts as a transcriptional activator or repressor depending on the cellular or chromosomal context. Inactivating mutations in the tumor suppressor gene WT1 have been identified in patients with Wilms' tumor and in a subset of sporadic cancers.

However, in desmoblastic small round cell tumors (DSRCT) recurrent translocations affecting the WT1 gene have been found DSRCT is a highly aggressive mesenchymal tumor that primarily affects male adolescents and young adults. The translocation t(11;22)(p13;q12.2) is detectable in virtually all DSRCT tested and results in the fusion of the potent transcriptional activator domain of the EWSR1 gene and the DNA-binding zinc-finger domains of the WT1 gene. The EWSR1-WT1 chimeric protein acts as an oncogenic transcription factor as evidenced by its ability to transform cells *in vitro*.

While EWSR1 rearrangements are present in about 90% of DSRCT but are also frequently found in other small round blue cell neoplasms as e.g. Ewing sarcoma, WT1 translocations are exclusively found in DSRCT. Hence, detection of the t(11;22) by Fluorescence *in situ* Hybridization represents a valuable tool for the differential diagnosis of DSRCT.

References

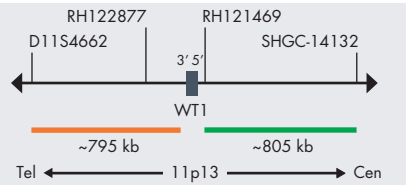
Gerald WL, *et al.* (1995) Proc Natl Acad Sci U S A 92: 1028-32.
Kim J, *et al.* (1998) Oncogene 16: 1973-9.
Ladanyi M & Gerald W (1994) Cancer Res 54: 2837-40.
Wang ZY, *et al.* (1993) J Biol Chem 268: 9172-5.

Probe Description

The ZytoLight SPEC WT1 Dual Color Break Apart Probe is composed of:

- ZyGreen (excitation 503 nm/emission 528 nm) labeled polynucleotides (~10 ng/µl), which target sequences mapping in 11p13* (chr11:32,492,523-33,297,615) proximal to the WT1 breakpoint region (see Fig. 1).
- ZyOrange (excitation 547 nm/emission 572 nm) labeled polynucleotides (~4,5 ng/µl), which target sequences mapping in 11p13* (chr11:31,590,767-32,388,208) distal to the WT1 breakpoint region (see Fig. 1).
- Formamide based hybridization buffer

* according to Human Genome Assembly GRCh37/hg19



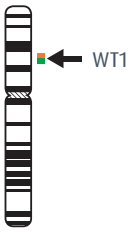
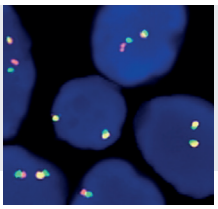


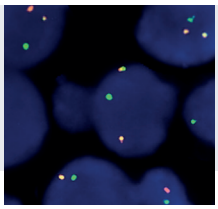
Fig. 1: SPEC WT1 Probe map (not to scale); Right: Ideogram of chromosome 11 indicating the hybridization locations

Results

Normal situation: In interphases of normal cells or cells without a translocation involving the WT1 gene region, two green/orange fusion signals appear.
Aberrant situation: One WT1 gene region affected by a translocation is indicated by one separate green signal and one separate orange signal.



Hybridized to normal interphase cells as indicated by two orange/green fusion signals per nucleus.



Desmoblastic small roand cell tumor tissue section with translocation affecting the 11p13 locus as indicated by one non-rearranged orange/green fusion signal, one orange signal, and one separate green signal.

Labels	Chromosome	Reg. Status	Tests	Order No.
●|●	11	CE/IVD	5 (50 µl)	**Z-2142-50**