ZytoLight® SPEC SS18/SSX1 TriCheck™ Probe

Intended Purpose

The ZytoLight SPEC SS18/SSX1 TriCheck™ Probe is designed to detect translocations involving the chromosomal region 18q11.2 harboring the SS18 (SS18, nBAF chromatin remodeling complex subunit, a.k.a. SYT) gene and the chromosomal region Xp11.23 harboring the SSX1 (SSX family member 1) gene.

Synovial sarcoma is characterized by the t(X;18) found in more than 95% of these tumors and juxtaposing the SS18 gene in 18q11.2 either next to the SSX1 or the SSX2 gene, or very rarely to the SSX4 locus.

Synovial sarcoma is one of the most common soft tissue tumors that typically occurs in the extremities of young adults with greater prevalence in males, even though, the occurrence of synovial sarcoma has also been described in a wide variety of anatomical locations and in all ages.

In combination with histopathological diagnosis, detection of SS18 rearrangements via FISH is a valuable tool to confirm the diagnosis of synovial sarcoma. Moreover, patients with SS18-SSX1 fusions were shown to have a higher risk of developing metastases compared to those with SS18-SSX2 fusions. Hence, detection of the SS18 fusion gene variant by FISH may also be of prognostic significance.

References

Amary MF, *et al.* (2007) Mod Pathol 20: 482-96.
Clark J, *et al.* (1994) Nat Genet 7: 502-8.
Kawai A, *et al.* (1998) N Engl J Med 338: 153-60.
Panagopoulos I, *et al.* (2001) Genes Chromosomes Cancer 31: 362-72.
Surace C, *et al.* (2004) Lab Invest 84: 1185-92.
Torres L, *et al.* (2008) Cancer Genet Cytogenet 187: 45-9.

Probe Description

The ZytoLight SPEC SS18/SSX1 TriCheck Probe is composed of:

- ZyGreen (excitation 503 nm/emission 528 nm) labeled polynucleotides (~10,0 ng/µl), which target sequences mapping in 18q11.2* (chr18:23,109,942-23,466,217) proximal to the SS18 breakpoint region (see Fig. 1).
- ZyOrange (excitation 547 nm/emission 572 nm) labeled polynucleotides (~4,5 ng/µl), which target sequences mapping in 18q11.2* (chr18:23,772,255-24,137,169) distal to the SS18 breakpoint region (see Fig. 1).
- ZyBlue (excitation 418 nm/emission 467 nm) labeled polynucleotides (~37,0 ng/µl), which target sequences mapping in Xp11.23* (chrX:48,265,856-48,792,674) proximal to the SSX1 breakpoint region (see Fig. 1).
- Formamide based hybridization buffer

* according to Human Genome Assembly GRCh37/hg19

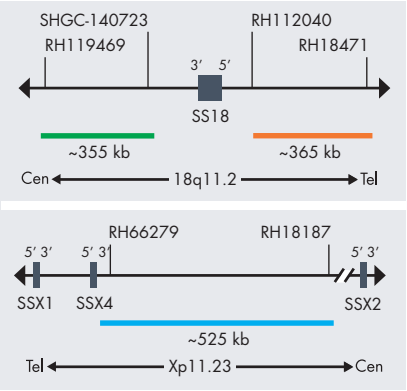
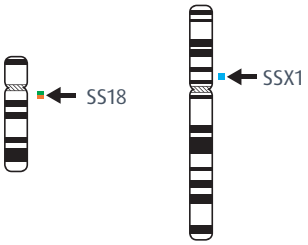


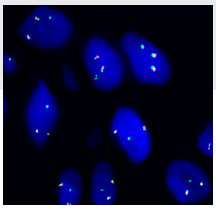
Fig. 1: Top: SPEC SS18 Probe map; Bottom: SPEC SSX1 Probe map (not to scale)



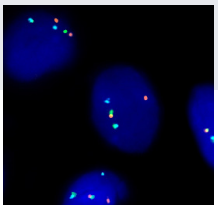
Ideograms of chromosome 18 and X indicating the hybridization locations

Results

Normal situation: In nterphases of normal female cells or female cells without SS18-SSX1 rearrangement, two green/orange fusion signals and two blue signals appear. In interphases of normal male cells or male cells without SS18-SSX1 rearrangement, two green/orange fusion signals and one blue signal appear.
Aberrant situation: An SS18-SSX1 or an SS18-SSX4 fusion is indicated by one separate orange signal co-localizing with one blue signal and one separate green signal. An SS18-SSX2 fusion is indicated by one separate green signal, one separate orange signal, and a blue signal in close proximity of the separated green signal. An SS18 translocation without involvement of SSX1, SSX2, or SSX4 is indicated by the split of one green/orange fusion signal without co-localization of the separated orange or green signal with one blue signal.



Male synovial sarcoma tissue section with SS18-SSX1 or SS18-SSX4 fusion as indicated by orange/blue fusion signals.



Female synovial sarcoma tissue section with SS18-SSX2 fusion as indicated by green/blue fusion signals.

Labels	Chromosome	Reg. Status	Tests	Order No.
	18, X	CE/IVD	5 (50 µl)	**Z-2184-50**