ZytoLight® SPEC EGFR/CEN 7 Dual Color Probe

Intended Purpose

The ZytoLight SPEC EGFR/CEN 7 Dual Color Probe (PL15) is intended to be used for the qualitative detection of amplifications involving the human EGFR gene as well as the detection of chromosome 7 alpha satellites in formalin-fixed, paraffin-embedded specimens, such as non-small cell lung cancer (NSCLC) and glioma, by fluorescence *in situ* hybridization (FISH). The probe is intended to be used in combination with the ZytoLight FISH-Tissue Implementation Kit (Prod. No. Z-2028-5/-20).

The product is intended for professional use only. All tests using the product should be performed in a certified, licensed anatomic pathology laboratory under the supervision of a pathologist/human geneticist by qualified personnel.

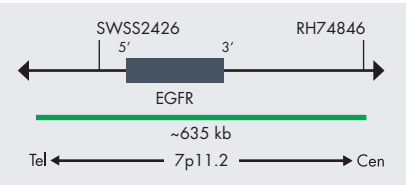
The probe is intended to be used as an aid to the differential diagnosis of NSCLC and glioma and therapeutic measures should not be initiated based on the test result alone.

Probe Description

The ZytoLight SPEC EGFR/CEN 7 Dual Color Probe is composed of:

- ZyGreen (excitation 503 nm/emission 528 nm) labeled polynucleotides (~10 ng/µl), which target sequences mapping in 7p11.2* (chr7:54,912,555-55,548,375) harboring the EGFR gene region (see Fig. 1).
- ZyOrange (excitation 547 nm/emission 572 nm) labeled polynucleotides (~1,5 ng/µl), which target sequences mapping in 7p11.1-q11.1 specific for the alpha satellite centromeric region D7Z1 of chromosome 7.
- Formamide based hybridization buffer

* according to Human Genome Assembly GRCh37/hg19



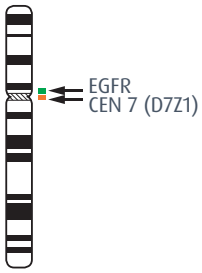
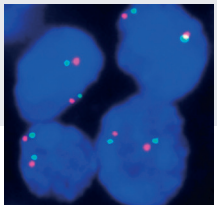


Fig. 1: SPEC EGFR Probe map (not to scale); Right: Ideogram of chromosome 7 indicating the hybridization locations

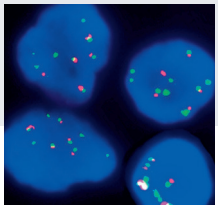
Results

Normal situation: In interphases of normal cells or cells without an amplification involving the EGFR gene region, two green and two orange signals appear.

Aberrant situation: In cells with an amplification of the EGFR gene region, multiple copies of the green signal or green signal clusters will be observed.



Hybridized to normal interphase cells as indicated by two orange and two green signals in each nucleus.



Cancer cells with multiple copies of chromosome 7 and extra EGFR signals (green) in a sample from an NSCLC patient.

Labels	Chromosome	Reg. Status	Tests	Order No.
●|●	7	CE/IVD	5 (50 µl)	Z-2033-50
			20 (200 µl)	Z-2033-200

ZytoLight® SPEC Williams-Beuren Dual Color Probe

Intended Purpose

The ZytoLight SPEC Williams-Beuren Dual Color Probe is designed to detect deletions affecting the chromosomal region 7q11.23 harboring the ELN (elastin, a.k.a. WBS) gene.

The Williams-Beuren syndrome (WBS) is a genetic disorder caused by a hemizygous contiguous gene deletion on chromosome 7q11.23. The estimated prevalence of the disease ranges between 1/7,500 and 1/20,000 newborns. The WBS deletion region (~1.5-1.8 Mb) consists of a single copy gene region containing app. 28 genes, including the ELN gene that is flanked by repetitive sequences known as low-copy repeats (LCRs).

The deletions arise as a consequence of misalignment of these repetitive sequences during meiosis and a following unequal crossing over due to high similarity of LCRs. Usually, WBS occurs sporadically, but some parents of WBS patients were shown to carry a paracentric inversion of the WBS locus. Presence of this inversion predisposes to chromosomal mispairing in meiosis. WBS patients clinically display a characteristic pattern of symptoms including vascular stenosis, weakness of connective tissue, a typical face, short stature, overfriendliness, and mental retardation.

FISH analysis can be performed to confirm WBS diagnosis in patients with vascular stenosis together with mental retardation.

References

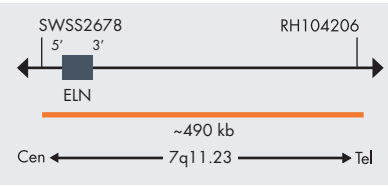
Bayés M, *et al.* (2003) Am J Hum Genet 73: 131-51.
Beuren AJ, *et al.* (1964) Am J Cardiol 13: 471-83.
Schubert C (2009) Cell Mol Life Sci 66: 1178-97.
Sugayama SM, *et al.* (2003) Arq Bras Cardiol 81: 462-73.
Williams JC, *et al.* (1961) Circulation 24: 1311-8.

Probe Description

The ZytoLight SPEC Williams-Beuren Dual Color Probe is composed of:

- ZyOrange (excitation 547 nm/emission 572 nm) labeled polynucleotides (~4.5 ng/µl), which target sequences mapping in 7q11.23* (chr7:73,408,390-73,899,599) harboring the ELN region (see Fig. 1).
- ZyGreen (excitation 503 nm/emission 528 nm) labeled polynucleotides (~4.5 ng/µl), which target sequences mapping in 7p11.1-q11.1 specific for the alpha satellite centromeric region D7Z1 of chromosome 7.
- Formamide based hybridization buffer

* according to Human Genome Assembly GRCh37/hg19



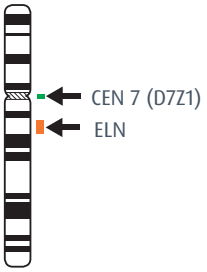
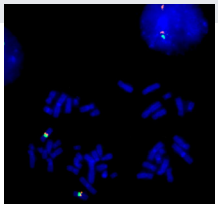


Fig. 1: SPEC ELN Probe map (not to scale);
Right: Ideogram of chromosome 7 indicating the hybridization locations

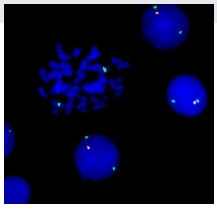
Results

Normal situation: In Interphases of normal cells or cells without a deletion involving the ELN gene region, two orange signals and two green signals appear.

Aberrant situation: In a cell with deletion affecting the ELN gene region, a reduced number of orange signals will be observed. Deletions affecting only parts of the ELN gene region might result in a normal signal pattern with orange signals of reduced size.



Hybridized to normal interphase cells as indicated by two orange and two green signals in each nucleus and to metaphase chromosomes of a normal cell.



Lymphocytes and metaphase chromosomes from a Williams-Beuren syndrome case showing an ELN deletion as indicated by the loss of one orange signal.

Labels	Chromosome	Reg. Status	Tests	Order No.
●|●	7	CE/IVD	5 (50 µl)	Z-2302-50