

# ZytoLight® SPEC ESR1/CEN 6 Dual Color Probe

## Background

The ZytoLight® SPEC ESR1/CEN 6 Dual Color Probe is designed for the detection of ESR1 gene amplification frequently observed in breast cancer. The ESR1 (estrogen receptor 1) gene is located in the chromosomal region 6q25 and encodes estrogen receptor alpha (ER). ER expression is one of the most important known factors in the development of breast cancer, and assessing its status by immunohistochemistry is important for determining the use of anti-estrogen receptor therapies.

ESR1 gene amplification has been found frequently in ER-positive breast tumors. Additionally, it has been shown very recently for breast cancer patients receiving adjuvant tamoxifen monotherapy that survival is significantly longer in cases of ESR1 gene amplification as determined by FISH compared to immunohistochemically ER-positive cases without gene amplification. Additionally, it has been shown that response to tamoxifen is dependent on the absolute ESR1 copy number. Thus, determination of ESR1 amplification may identify a subgroup of breast cancer patients particularly likely to respond to anti-estrogen therapy.

## Probe Description

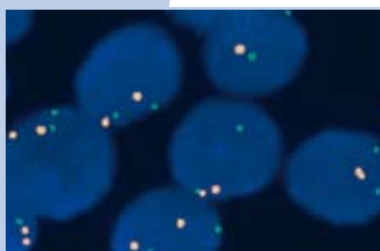
The SPEC ESR1/CEN 6 Dual Color Probe is a mixture of an orange fluorochrome direct labeled CEN 6 probe specific for the alpha satellite centromeric region of chromosome 6 (D6Z1) and a green fluorochrome direct labeled SPEC ESR1 probe hybridizing to the ESR1 locus at 6q25. Orange fluorochrome is ZyOrange: Excitation 547 nm, emission 572 nm (equivalent to Rhodamine). Green fluorochrome is ZyGreen: Excitation 503 nm, emission 528 nm (equivalent to FITC).

## Results

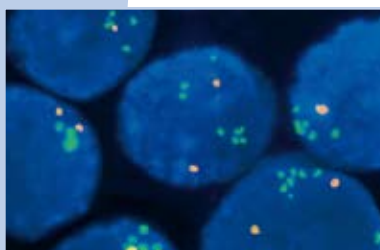
In a normal interphase nucleus, two orange and two green signals are expected. In a cell with amplification of the ESR1 gene locus, multiple copies of the green signal or green signal clusters will be observed.

## References

- Nembrot M, et al. (1990) *Biochem Biophys Res Comm* **166**: 601-7.
- Nessling M, et al. (2005) *Cancer Res* **65**: 439-47.
- Holst F, et al. (2007) *Nature Genet* **39**: 655-60.
- Lacroix M (2006) *Endocr Relat Cancer* **13**: 1033-67.



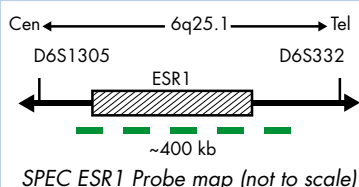
SPEC ESR1/CEN 6 Dual Color Probe hybridized to normal interphase cells as indicated by two orange and two green signals in each nucleus.



ESR1 gene amplification as indicated by multiple green ESR1 specific signals in each nucleus.



Ideogram of chromosome 6 indicating the hybridization locations.



Prod. No.	Product	Label	Tests*
Z-2069-200	ZytoLight® SPEC ESR1/CEN 6 Dual Color Probe	green/orange	20
Z-2070-20	ZytoLight® SPEC ESR1/CEN 6 Dual Color Probe Kit Incl. Heat Pretreatment Solution Citric, 500ml; Pepsin Solution, 4 ml; Wash Buffer SSC, 500 ml; Probe, 0.2 ml; 25x Wash Buffer A, 100 ml; DAPI/Antifade-Solution, 0.8 ml		20

\* Using 10 µl probe solution per test.