

## ZytoLight® SPEC KRAS/CEN 12 Dual Color Probe

### Background

The ZytoLight® SPEC KRAS/CEN 12 Dual Color Probe is designed for the detection of KRAS gene amplifications found e.g. in lung cancer.

The KRAS (v-Ki-ras2 Kirsten rat sarcoma viral oncogene homolog) gene located on chromosome 12p12.1 is a member of the RAS gene family comprising HRAS, KRAS, and NRAS, all of which encode a 21 kDa protein. The wildtype proteins play a pivotal role in cell proliferation, differentiation, and senescence. Mutations of KRAS are frequently found in epithelial malignancies and lead to activation of the downstream mitogen-activated protein kinase (MAPK) resulting in unchecked cellular proliferation and tumor progression.

Amplifications of KRAS and the implications in tumorigenesis are not as well characterized as KRAS mutations. However, recent studies using different methods found amplification of KRAS or copy number gain of the 12p12.1 region including KRAS in various primary tumors, as e.g. in lung, colorectal, pancreatic, and gastric cancers.

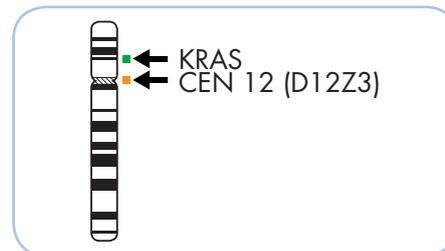
For non-small cell lung cancer (NSCLC) patients KRAS amplification as assessed by Fluorescence *in situ* Hybridization (FISH) was detected in about 15% of the tumors. Amplification of KRAS was found to be correlated with poor prognosis and may act synergistically with KRAS mutations to promote tumor progression.

### References

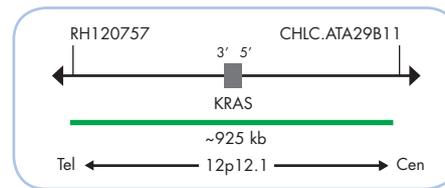
Little AS, et al. (2011) *Sci Signal* 4: er2.  
Mita H, et al. (2009) *BMC Cancer* 9: 198.  
Sasaki H, et al. (2011) *J Thorac Oncol* 6: 15-20.  
Wagner PL, et al. (2011) *Lung Cancer* 74: 118-23.

### Probe Description

The SPEC KRAS/CEN 12 Dual Color Probe is a mixture of an orange fluorochrome direct labeled CEN 12 probe specific for the alpha satellite centromeric region of chromosome 12 (D12Z3) and a green fluorochrome direct labeled SPEC KRAS probe specific for the KRAS gene at 12p12.1.



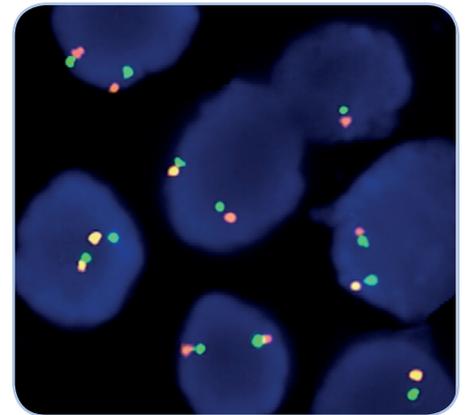
Ideogram of chromosome 12 indicating the hybridization locations.



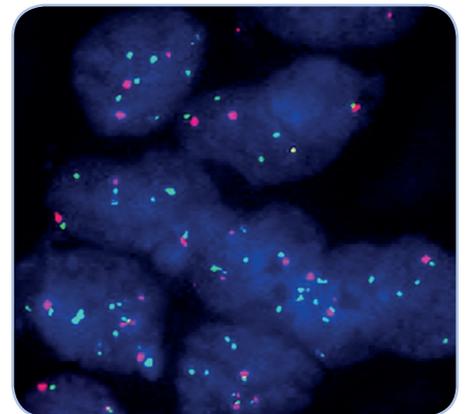
SPEC KRAS Probe map (not to scale).

### Results

In a normal interphase nucleus, two orange and two green signals are expected. Nuclei with amplification of the KRAS gene locus 12p12.1 or aneuploidy of chromosome 12 will show multiple copies of the green signal or large green signal clusters.



SPEC KRAS/CEN 12 Dual Color Probe hybridized to normal interphase cells as indicated by two orange and two green signals in each nucleus.



Lung cancer tissue section with amplification of the KRAS gene (green).

Image kindly provided by Prof. Diebold, Lucerne, Switzerland.

Prod. No.	Product	Label	Tests* (Volume)
Z-2115-200	ZytoLight SPEC KRAS/CEN 12 Dual Color Probe CE IVD	●/●	20 (200 µl)
<b>Related Products</b>			
Z-2028-20	ZytoLight FISH-Tissue Implementation Kit CE IVD		20
Incl. Heat Pretreatment Solution Citric, 500 ml; Pepsin Solution, 4 ml; Wash Buffer SSC, 500 ml; 25x Wash Buffer A, 100 ml; DAPI/DuraTect-Solution, 0.8 ml			

\* 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.