ZytoLight® SPEC MAF/IGH Dual Color Dual Fusion Probe

CE IVD

Background

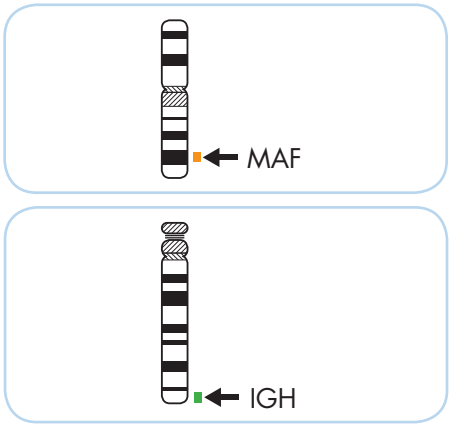
The ZytoLight® SPEC MAF/IGH Dual Color Dual Fusion Probe is designed to detect the translocations affecting the MAF gene in the chromosomal region 16q23.2 and the IGH locus in 14q32.33. The translocation t(14;16)(q32.3;q23) is frequently found in multiple myeloma (MM).
MM is a malignant post-germinal center tumor of somatically-mutated, isotype-switched plasma cells that accumulate in the bone marrow. It is often preceded by a premalignant state known as monoclonal gammopathy of undetermined significance (MGUS). Five recurrent primary translocations involving the immunoglobulin heavy locus (IGH) have been identified in 40% of MGUS and MM tumors. They include t(11;14)(q13.3;q32.3), t(6;14)(p21.1;q32.3), t(4;14)(p16.3;q32.3), t(14;16)(q32.3;q23), and t(14;20)(q32.3;q12), which involve the genes CCND1, CCND3, FGFR3 and NSD2, MAF, and MAFB, respectively. All of these translocations lead to the dysregulation and overexpression of the target genes as a consequence of their juxtaposition to regulatory sequences of the IGH locus. t(14;16) occurs in approximately 5% of MM patients and is associated with a more aggressive clinical outcome. The 16q23 breakpoints have been found to be scattered 550-1280 kb centromerically to the MAF gene within the WWOX gene. Hence, detection of t(14;16) by FISH represents a useful prognostic tool and may aid in therapeutic decision making in MM.

References
Chesi M, et al. (1998) Blood 91: 4457-63.
Fabris S, et al. (2005) Genes Chromosomes Cancer 42: 117-27.
Fonseca R, et al. (2009) Leukemia 23: 2210-21.
Gabrea A, et al. (2006) DNA Repair (Amst) 5: 1225-33.

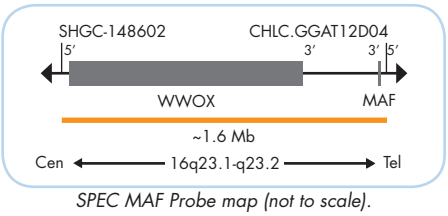
Probe Description

The ZytoLight® SPEC MAF/IGH Dual Color Dual Fusion Probe is composed of:

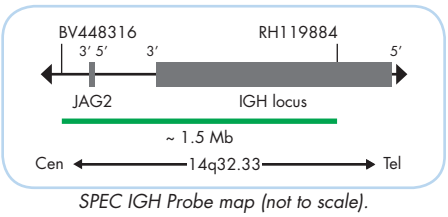
- ZyOrange (excitation 547 nm/emission 572 nm) labeled polynucleotides (~6.0 ng/µl), which target sequences mapping in 16q23.1-q23.2** (chr16:78,089,697-79,657,277) harboring the MAF gene region.
- ZyGreen (excitation 503 nm/emission 528 nm) labeled polynucleotides (~12.0 ng/µl), which target sequences mapping in 14q32.33** (chr14:105,462,169-106,995,000) harboring the IGH locus.
- Formamid based hybridization buffer



Ideograms of chromosome 16 (above) and 14 (below) indicating the hybridization locations.



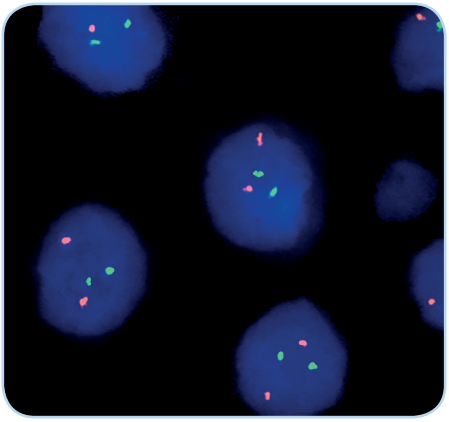
SPEC MAF Probe map (not to scale).



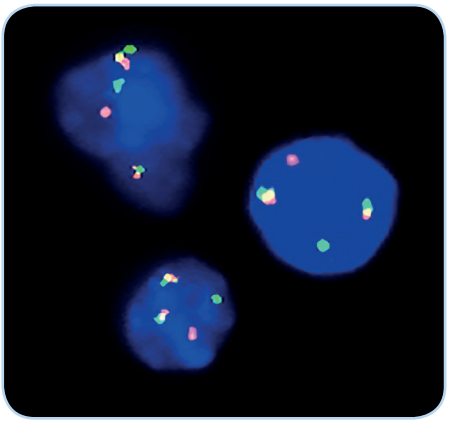
SPEC IGH Probe map (not to scale).

Results

In a normal interphase nucleus, two orange and two green signals are expected. A reciprocal translocation involving two breakpoints splits the two signals and generates a fusion signal on each of the chromosomes involved. The chromosomal regions which are not translocated are indicated by the single orange and green signal, respectively.



SPEC MAF/IGH Dual Color Dual Fusion Probe hybridized to normal interphase cells as indicated by two orange and two green signals in each nucleus.



Bone marrow CD138+ cells with translocation affecting the MAF/IGH loci as indicated by two orange/green fusion signals, a single orange, and a separate green signal in each nucleus.

Kindly provided by Prof. Dr. Oskar A. Haas, Vienna, Austria.

Prod. No.	Product	Label	Tests* (Volume)
Z-2270-50	ZytoLight SPEC MAF/IGH Dual Color Dual Fusion Probe CE IVD	●/●	5 (50 µl)
Products			
Z-2099-20	ZytoLight FISH-Cytology Implementation Kit CE IVD Incl. Cytology Pepsin Solution, 4 ml; 20x Wash Buffer TBS, 50 ml; 10x $MgCl_2$, 50 ml; 10x PBS, 50 ml; Cytology Stringency Wash Buffer SSC, 500 ml; Cytology Wash Buffer SSC, 500 ml; DAPI/DuraTect-Solution, 0.8 ml		20

** Using 10 µl probe solution per test. IVD labeled products are only available in certain countries. All other countries research use only! Please contact your local dealer for more information.*

***According to Human Genome Assembly GRCh37/hg19*