**Background**

The ZytoLight® SPEC MAFB/IGH Dual Color Dual Fusion Probe is designed to detect the translocations affecting the MAFB gene in the chromosomal region 20q12 and the IGH locus in 14q32.33. The translocation t(14;20)(q32.3;q12) is frequently found in multiple myeloma (MM). MM is a low proliferative, 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 deregulation and overexpression of the target genes as a consequence of their juxtaposition to regulatory sequences of the IGH locus.

The t(14;20) occurs in approximately 1-2% of MM patients and is associated with an adverse prognosis. Thus, currently, detection of t(14;20) by FISH is a reliable prognostic tool and may sustain therapeutic decision making in MM.

**Probe Description**

The SPEC MAFB/IGH Dual Color Dual Fusion Probe is a mixture of an orange fluorochrome direct labeled MAFB probe spanning MAFB and proximal regions known for variable breakpoints, and a green fluorochrome direct labeled IGH probe spanning the known breakpoints of the IGH locus.

**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.

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**References**


![Image of Ideograms of chromosome 20 (above) and 14 (below) indicating the hybridization locations.](image)

![Image of SPEC MAFB/IGH Dual Fusion Probe hybridized to normal interphase cells as indicated by two orange/green fusion signals, a single orange, and a separate green signal in each nucleus.](image)

![Image of Bone marrow CD138+ cells with translocation affecting the MAFB/IGH loci as indicated by two orange/green fusion signals, a single orange, and a separate green signal in each nucleus.](image)

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

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**ZytoLight® SPEC MAFB/IGH Dual Color Dual Fusion Probe**

- **Z-2271-50** ZytoLight SPEC MAFB/IGH Dual Color Dual Fusion Probe C E IVD

**Produced by:** ZytoVision GmbH · Fischkai 1 · 27572 Bremerhaven · Germany · www.zytovision.com

**Z-2271-50** ZytoLight SPEC MAFB/IGH Dual Color Dual Fusion Probe C E IVD

**Label** Tests* (Volume)

- **Z-2028** ZytoLight FISH-Tissue Implementation Kit C E IVD
  - Incl. Heat Pretreatment Solution Citrate, 150 ml; Pepsin Solution, 3 ml; Wash Buffer SSC, 210 ml; 25x Wash Buffer A, 50 ml; DAPI/DuraTect Solution, 0.2 ml

- **Z-2099** ZytoLight FISH-Cytology Implementation Kit C E IVD
  - Incl. Cytology Pepsin Solution, 4 ml; 20x Wash Buffer TBS, 50 ml; 10x TBS, 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

* 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.