ITALIA
Empowering Personalized Cancer Treatment

PML/RARA DNA-FISH Probe

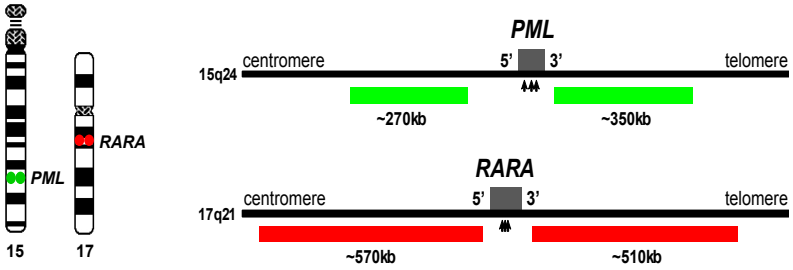
Two Color, Two Fusion Translocation Probe CE

Ref: 12-008

PML/RARA

Intended Use

The *PML/RARA* DNA-FISH Probe is designed to detect the translocation between the *PML* gene on chromosome 15q24 (previously assigned to band 15q22) and the *RARA* gene on chromosome 17q21, using fluorescence *in situ* hybridization (FISH). The t(15;17) translocation is the diagnostic hallmark of acute promyelocytic leukemia (APL), a sub-group of acute myelogenous leukemia (AML), and results in the fusion of the *PML* and *RARA* genes.[1] The presence of a PML-RARA fusion predicts a favorable response to differentiation therapy with all-trans retinoic acid (ATRA) and is currently the most curable subtype of acute myeloid leukemia (AML).[1-3] The t(15;17) translocation has also been identified in chronic myeloid leukemia (CML) cases with promyelocytic blast crisis.



Schematic of the *PML/RARA* DNA-FISH Probe:

Horizontal red and green bars indicate the regions covered by the probes (approximate to scale, NCBI Build 36.1/Hg18/2006). The directly labeled *PML* (green) and *RARA* (red) probes flank the common translocation breakpoints (arrows). In *PML*, the breakpoints cluster in three regions: bcr1 (exon 6-7, right arrow; 70%), bcr2 (exon 5-6, middle arrow; 10%), and bcr3 (intron 3-4, left arrow; 20%). In *RARA*, the breakpoints cluster within the approximate 17 kb intron 2.

Signal Interpretation

In normal diploid metaphase chromosomes and interphase nuclei, the *PML/RARA* DNA-FISH Probe generates two green and two red signals corresponding to the two normal homologous chromosomes 15 and 17, respectively (Figure 1). In cells with translocation between *PML* and *RARA*, the most commonly observed pattern is one green and one red signal, representing the normal chromosomes 15 and 17, and two fusion signals (red/green or yellow) representing the two translocated chromosomes (Figure 2). Variant, masked, or 3-way translocations resulting in other signal patterns have been reported.[2-5] It is recommended to confirm variant pattern or atypical signal patterns by metaphase analysis whenever possible.

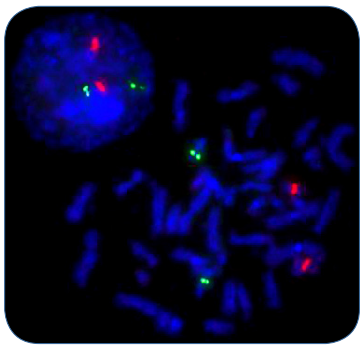


Figure 1: Normal diploid metaphase and interphase nucleus (from normal peripheral blood specimen) with 2 red (*RARA*) and 2 green (*PML*) signals.

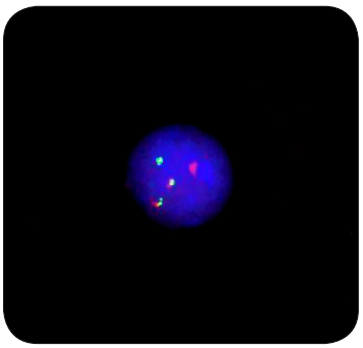


Figure 2: Interphase nuclei with 1 red (*RARA*), 1 green (*PML*), and 2 fusion (red/green or yellow) signals.

References

1. Kakizuka, a., et al., Cell, 1991. 66: 663-74.
2. Brockman, S. R, et al. Cancer Genet Cytogenet, 2003. 145:144-15.
3. Mistry, A.R., et al., Blood Rev., 2003. 17(2): 71-97.

Fluorescence Microscopy Filter Requirements

Fluorophore	Excitation $_{max}$	Emission $_{max}$
Green	496 nm	520 nm
Red	580 nm	603 nm
DAPI	360 nm	460 nm

Instructions for use are available at www.cancergeneticsitalia.com

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IVD/12-008, v.07.19.12