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## DATA SHEET

### eFISH PIK3CA/CEN 3Dual Color Probe

#### Catalog No.

**FP059-10X- 100µl-10 test**

**FP059-20X- 200µl-20 test**

Doc No: 932-FP059 Rev: D

Date of Release: 10-Jul-2024

Material Provided: One vial of eFISH probe in hybridization buffer (RTU).

#### Recommended detection system (Not supplied):

Either of the following detection system is recommended depending on the automation/manual platform used:

eFISH Kit	Cat #	Description
eFISH Histo	DF-500-20XE	Automation/Semi-automation
eFISH Cyto	DF-510-20XE	Automation/Semi-automation

#### Intended Use:

The BioGenex eFISH PIK3CA/CEN 3Dual Color Probe is currently available for Research use only. eFISH PIK3CA/CEN 3 Dual Color Probe is designed to detect human PIK3CA gene as well as chromosome 3 alpha-satellites in formalin-fixed, paraffin-embedded tissue or cells by fluorescence in situ hybridization (FISH).

BioGenex eFISH PIK3CA/CEN 3 Dual Color Probe comes in Ready to use format in hybridization buffer. The probe contains green-labeled polynucleotides (Green: excitation at 503 nm and emission at 528 nm, similar to FITC which target PIK3CA gene and orange-labeled polynucleotides (Orange: excitation at 547 nm and emission at 572 nm, similar to rhodamine), which targets alpha satellite-sequences of the centromere of chromosome 3.

#### Summary and Explanation

Fluorescence *in situ* hybridization (FISH) is a robust technique of cytogenetic used for the detection of chromosomal aberrations, presence or absence of specific DNA sequence in native context. In this technique fluorescent probes bind to the target sequence of DNA in chromosome. High specificity and sensitivity coupled rapid and an accurate result has proven role of FISH in both research and diagnosis of solid tumor and hematological malignancies. As technique of cancer cytogenetics, FISH, can be used to identify genetic aberrations viz., deletions, amplification and translocation in tissue sections or within individual cells. FISH is also used for use in genetic counseling, medicine, and species identification. FISH can also be used to detect and localize specific RNA targets in cells,

circulating tumor cells, and tissue samples<sup>1,2,3,4,5</sup>.

In FISH procedure, fixed tissue sections are pretreated to expose target DNA or mRNA sequences. An appropriately labeled probe is hybridized to the exposed target DNA or mRNA sequences in the cells. Subsequent stringent washing steps remove any probe that is non-specifically bound to the tissue section. Subsequently slides are mounted using DAPI/antifade and can be visualized under fluorescence microscope using appropriate filter set.

#### Principles of the Procedure

*In Situ* hybridization (ISH) allows the detection and localization of definitive nucleic acid sequences directly within a cell or tissue. High specificity is ensured through the action of annealing of fluorescence probe nucleic acid sequence to complementary target nucleic acid sequence. ISH techniques can be used to identify genetic aberrations like deletions, amplification, and translocation in tissue sections or within individual cells.

#### Storage and Handling

BioGenex eFISH PIK3CA/CEN 3 Dual Color Probe must be stored at 2-8°C, protected from light and is stable through the expiry date printed on the label.

#### Specimen Collection and Slide Preparation

Tissues fixed in 10% (v/v) formalin are suitable for use prior to paraffin embedding and sectioning.

#### FISH Staining procedure

- The BioGenex eFISH probes are supplied in hybridization buffer and used without further dilution.
- Protocol:

Please refer to the eFISH probe specific instruction/protocol for automated or semi-automated FISH processing platform (Xmatrx®-Infinity, Xmatrx®-Nano and Xmatrx®-mini).

Further processing, such as washing and counter-staining, can be completed according to the user's needs. For a particularly user-friendly performance, we recommend the use of a BioGenex eFISH kit.

These systems were also used for the confirmation of appropriateness of the eFISH PIK3CA/CEN 3 Dual Color Probe.

**Disclaimer:** The above information is provided for reference only. Each end-user is responsible for developing and validating optimal testing conditions for use with this product.

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### Troubleshooting

Contact BioGenex Technical Service Department at **1-800-421-4149** or your local **distributor** to report unusual staining.

### Expected Results

The use of eFISH PIK3CA/CEN 3 Dual Color Probe along with appropriate filters produces green signal for PIK3CA gene and the hybridization signals of the labeled alpha-satellite-sequences of the centromere of chromosome 3 appear orange.

Normal interphase cells or cells without aberrations of chromosome 3, two PIK3CA signals and two chromosome 3 signals appear. Cells with a gene amplification have an increased number of gene specific signals or signal clusters.

However, we recommend the use of a control sample in which the chromosome 3 and PIK3CA gene copy number is known to judge the specificity of the signals with each hybridization reaction.

Care should be taken not to evaluate overlapping cells, in order to avoid false results, e.g. an amplification of genes. Due to decondensed chromatin, single FISH signals can appear as small signal clusters. Thus, two or three signals of the same size, separated by a distance equal to or less than the diameter of one signal, should be counted as one signal.

### Limitations of the Procedure

Correct treatment of tissues prior to and during fixation, embedding, and sectioning is important for obtaining optimal results. Inconsistent results may be due to variations in tissue processing, as well as inherent variations in tissue. The results from *in situ* hybridization must be correlated with other laboratory findings.

### Bibliography

1. Gall, J. G. and Pardue, M. L. (1969). *Proc. Natl. Acad. Sci. USA* 63, 378 -383.
2. Rudkin, G. T. and Stollar, B. D. (1977). *Nature* 265,472-473.
3. Hougaard, D. M., Hansen, H. and Larsson, L. I. (1997). *Histochem. Cell Biol.* 108,335 -344.
4. Bauman, J. G., Wiegant, J., Borst, P. and van Duijn, P. (1980). *Cell Res.* 128,485 - 490.
5. O'Connor et al. (2008). *Nature Education* 1(1):171.
6. Shayesteh L, et al. (1999) *Nat Genet* 21: 99-102.
7. Shi J, et al. (2012) *BMC Cancer* 12: 50.
8. Kievits, T. *et al. Cytogenet. Cell Genet.* **53**, 134–136 (1990).
9. Ji M, et al. (2011) *BMC Cancer* 11:147