

Product Cat. No.: GBS-080

**For Research Use Only.**

## MYB/NFIB gene fusion t(6;9) probe reagent Instructions Manual

**[Product Name]** MYB/NFIB gene fusion t(6;9) probe reagent.

**[Package Specifications]** 10 Tests/box.

### **[Intended Usage]**

This kit performs fluorescence in situ hybridization staining based on conventional staining, and provides auxiliary information for diagnosis for physicians. The test results are for clinical reference only and should not be used as the sole basis for clinical diagnosis. Clinicians should make comprehensive judgments on the test results based on factors such as the patient's condition, drug indications, treatment response and other laboratory test indicators.

### **[Detection Principle]**

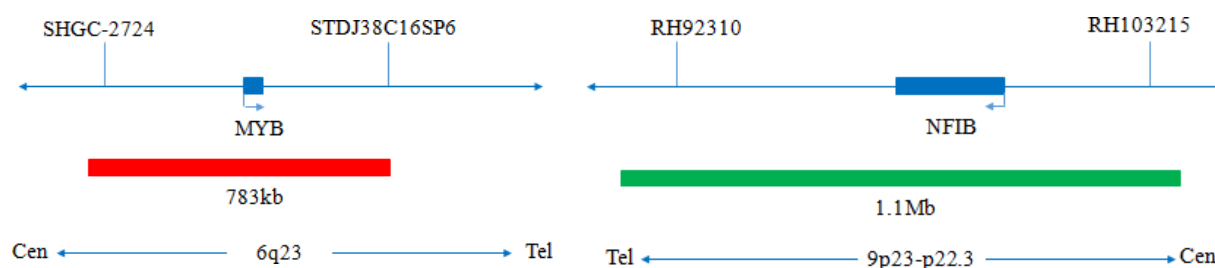
Fluorescence in situ hybridization is a technique for directly observing specific nucleic acids in cells in vitro. According to the principle of base complementary pairing, the specific probe is complementary to the target sequence in the cell. Due to the fluorescence of the probe, the gene state of the hybrid probe and the target sequence can be clearly observed under the fluorescence microscope under the appropriate excitation light.

### **[Product Main Components]**

The kit consists of MYB/NFIB dual-color probe, as shown in Table 1.

**Table 1: Kit composition**

Component name	Specifications	Quantity	Main components
MYB/NFIB gene fusion probe	100μL/Tube	1	MYB orange probe ; NFIB green probe



### **[Storage conditions & Validity]**

Keep sealed away from light at -20°C± 5°C. The product is valid for 12 months. Avoid unnecessary repeated freezing and thawing that should not exceed 10 times. After opening, within 24 hours for short-term preservation, keep sealed at 2-8°C in dark. For long-term preservation after opening, keep the lid sealed at -20°C± 5°C away from light. The kit is transported under 0°C.

### **[Applicable Instruments]**

Fluorescence microscopy imaging systems, including fluorescence microscopy and filter sets suitable for DAPI (367/452), Green (495/517), and Orange (547/565).

### [Sample requirements]

#### Tissue:

1. Applicable specimen types: Paraffin-embedded specimens from surgical excision or biopsy.
2. The tissue should be fixed with 4% neutral formaldehyde solution within 1 hour after isolation. After tissue fixation, it is routinely dehydrated and embedded in paraffin.

#### Cell:

1. Take 1-3mL of heparin sodium anticoagulant bone marrow cells.
2. Sample preservation: Fresh bone marrow specimen without fixation (preserved at 2-8°C for no more than 24 hours). After fixation, the cell suspension can be preserved at -20±5°C for no more than 12 months; the prepared cell slide can be preserved at -20±5°C for no more than 1 month. When the storage temperature of the sample is too high or too low, the cell suspension is volatilized excessively or polluted, the sample cannot be used for detection.

### [Test method]

#### 1. Related reagents

##### ① 20×SSC, pH 5.3±0.2

Weigh 176g of sodium chloride and 88g of sodium citrate, dissolve in 800mL of deionized water, adjust the pH to 5.3±0.2 at room temperature, and complete to 1 L with deionized water. High-pressure steam sterilization, stored at 2-8°C, the solution shelf life is of 6 months. Discard if the reagent appears cloudy (turbid) or contaminated.

##### ② 2×SSC, pH 7.0±0.2

Take 100mL of the above 20×SSC, dilute with 800mL deionized water, mix, adjust the pH to 7.0±0.2 at room temperature, complete to 1L with deionized water, stored at 2-8°C, the shelf life is of 6 months. Discard if the reagent appears cloudy (turbid) or contaminated.

##### ③ Ethanol Solution: 70% ethanol, 85% ethanol

Dilute 700ml, 850ml of ethanol with deionized water to 1L. The shelf life is of 6 months. Discard if the reagent appears cloudy (turbid) or contaminated.

##### ④ 0.3% NP-40/0.4×SSC solution, pH 7.0-7.5

Take 0.6mL NP-40 and 4mL 20×SSC, add 150mL deionized water, mix, adjust the pH to 7.0-7.5 at room temperature, with deionized water complete to a volume of 200mL. Stored at 2-8°C, the shelf life is of 6 months. Discard if the reagent appears cloudy (turbid) or contaminated.

##### ⑤ Fixation solution (methanol: glacial acetic acid = 3:1)

Prepare a ready to use fixation solution by mixing thoroughly 30ml of methanol and 10ml of glacial acetic acid.

##### ⑥ 0.075M KCl solution

Weigh 2.8g of potassium chloride, dissolve in 400mL of deionized water and complete to 500mL with deionized water. Stored at room temperature, the solution shelf life is of 6 months. Discard if the reagent appears cloudy (turbid) or contaminated.

##### ⑦ Diamidinyl phenylindole (DAPI) counterstain

Use commercially available anti-quenching DAPI counterstain.

#### 2. Sample processing before hybridization:

##### Tissue sample:

**Baking:** Slides heating at 80°C for 30min or 65°C for 2h or overnight.

**Dewaxing:** According to the customer laboratory protocol (Commonly with Xylene for 15min).

**Hydration:** Take out the slides and put them respectively into 100%, 85% and 70% EtOH at room temperature for 3 minutes each.

Take out the slides, and immerse them in deionized water for 3 minutes. Remove the excess of water on the slides by air-drying.

**Permeation:** Immerse the slides in deionized water at 100°C and boil continuously for 20-40 minutes (Conventional 20min). Remove the excess of water on the slides by air-drying.

**Digestion:** Protease enzymic digestion at 37°C for 10-40 minutes. Mix the protease work buffer (50mmol HCl) and the 10x protease solution (Pepsin concentration 5%) in a proportion of 9:1 to prepare the enzymatic digestion solution.

**Washing:** Wash with 2×SSC at room temperature for 5 minutes.

**Dehydration:** Take out the slides and dehydrate in 70%, 85%, and 100% gradient ethanol at room temperature for 2 minutes each time. Remove the excess of EtOH solution on the slides by air-drying.

#### Cells sample:

- ① Sample collection: take 1-3ml of heparin sodium anticoagulant bone marrow cells.
- ② Cell harvesting: the uncultured marrow cells or the cultured marrow cell samples were aspirated to a 15mL centrifuged tube at the bottom of the tip, and centrifuged at 500g for 5min. The supernatant was carefully aspirated and discarded, leaving about 500μL of residual liquid to suspend the cells again.
- ③ Cell washing: add 5ml of 1xPBS buffer solution, blow and mix up the heavy suspension cell precipitation, centrifugate 500g for 5min, carefully suck and discard the supernatant, and leave about 500μL of residual solution to heavy suspension cell; repeat once.
- ④ Cell hypotonic: add 10ml of hypotonic solution to each tube (37°C warm bath in advance), and water bath at 37°C hypotonic for 20min.
- ⑤ Cell pre fixation: add 1ml (10% volume) of fixed solution to the cell suspension after hypotonic treatment, gently blow and mix, centrifugate 500g immediately for 5min, remove the supernatant, and leave about 500μL of residual solution for cell suspension.
- ⑥ Cell fixation: slowly add 10ml of the fixed solution to the cell suspension, leave it at room temperature for 10min to fix the cell, centrifugate 500g for 5min, and leave about 500μL of the residual solution to re suspend the cell; repeat once (or fix the cell several times until the cell is precipitated, washed and cleaned).
- ⑦ Preparation of cell suspension: after the last centrifugation of cell fixation, the supernatant is sucked off, and a proper amount of fixed solution is added to make cell suspension with appropriate concentration.
- ⑧ Preparation: take 3-10μL cell suspension drop to slide, aging at 56°C for 0.5h.
- ⑨ The slides were rinsed twice in 2xSSC solution at room temperature for 5min each time.
- ⑩ Dehydration: the cell drops were placed in 70% ethanol, 85% ethanol and 100% ethanol for 2 minutes respectively and then dried naturally.

### 3. Denaturation and Hybridization

The following operations need to be carried out in the darkroom.

#### Tissue samples:

- ① Take out the probe, let it stand at room temperature for 5min, turn it upside down with force, fully mix the probe, and then centrifuge briefly (vortex instrument oscillation is prohibited), take 10μL was dropped on the hybridization area of cell drops and immediately covered with 22mm×22mm cover glass, the probe shall be evenly expanded under the cover glass without bubbles, and the edge shall be sealed with rubber glue (the edge must be completely sealed to prevent the dry piece from affecting the test results during hybridization).
- ② Put the tissue sections on the hybridizer, and denature at 85°C for 5min (the hybridizer should be preheated to 85°C in advance), and hybridize at 42°C for 2-16h.

#### Cell sample:

- ① Take out the probe, leave it at room temperature for 5min, turn it upside down with force, mix it well, and then centrifuge it for a short time (no vortex instrument vibration). Take 10μL of it and drop it into the cell drop hybridization area, immediately cover the cover glass of 22mm × 22mm. The probe should be evenly expanded under the cover glass without bubbles, and seal the edge with rubber glue (the edge must be completely sealed to prevent the dry piece from affecting the test results in the hybridization process).
- ② The cell drops were placed on the hybridizer and denatured at 88°C for 2min (the hybridizer should be preheated to 88°C) and hybridized at 45°C for 2 to 16 hours.

### 3. Washing

The following operations need to be carried out in the darkroom.

- ① Carefully remove the sealing glue around the cover glass with tweezers to avoid sticking or moving the cover glass, immerse the sample in 2xSSC for about 5S, take it out, gently push a corner of the cover glass to the edge of the slide with tweezers, and gently remove the cover glass with tweezers.

- ② Place the sample at 2xSSC room temperature for 1 min.
- ③ Take out the slides and immerse in a preheated at 68°C 0.3% NP-40/0.4xSSC (Preparation of 0.3% NP-40/0.4xSSC: For 1L preparation, take 3mL NP-40 and 20mL 20xSSC, dissolve fully, mix well, and use 1M NaOH to adjust the pH to 7.2) solution and wash for 2min.
- ④ Take out the sample and immerse it in deionized water preheated at 37°C in advance for 1min; dry it naturally in the dark environment.

## 5. Counterstaining





The following operations should be performed in a darkroom

10μL DAPI compound dye is dropped in the hybridization area of the glass slide and immediately covered. The suitable filter is selected for glass slide observation under the fluorescence microscope.

## 6. FISH results observation

Place the counterstained film under the fluorescence microscope, and first put it under the low-power objective lens (10x) confirm the cell area under the microscope; Go to 40x under the objective lens, find a position where the cells are evenly distributed; Then in the high-power objective (100x) the FISH results of nuclei are observed.

### [Interpretation of common signal types]

 MYB gene signal  NFIB gene signal	
	Negative : 2 orange 2 green
	Positive : 1 orange 1 green 2 fusion

### [Limitations of testing methods]

- ① The results of this reagent kit may be affected by various factors of the sample itself, as well as limitations such as hybridization temperature and time, operating environment, and limitations of current molecular biology technologies, which may lead to incorrect results.
- ② Users must understand the potential errors and limitations of accuracy that may exist during the testing process.

### [Precautions]

1. Please read this manual carefully before testing. Testing personnel should receive professional technical training, and signal counting personnel must be able to observe and distinguish orange red and green signals.
2. When testing clinical samples, when the hybridization signal count is difficult and the sample is insufficient for repeated retesting, or the cell count is insufficient for analysis, the test will not provide test results.
3. The DAPI dye used in this experiment has potential toxicity or carcinogenicity, and should be operated in a fume hood, wearing masks and gloves to avoid direct contact.
4. All chemicals have potential hazards and should be avoided from direct contact. Used reagent kits are clinical waste and should be properly disposed of.
5. This product is for clinical diagnosis and scientific research.



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**[Manual Approval date & Revision date]**

V1. 0: Approval date: April 27, 2020.

V1. 2: Revision date: June 17, 2024.