

## Biotin Styramide \*Superior Replacement for Biotin Tyramide\*

Catalog number: 45300  
Unit size: 100 Slides

Component	Storage	Amount (Cat No. 45300)
Biotin Styramide *Superior Replacement for Biotin Tyramide*	Freeze (< -15 °C), Minimize light exposure	100 Slides

### OVERVIEW

Power Styramide™ Signal Amplification (PSA™) system is one of the most sensitive methods that can detect extremely low-abundance targets in cells and tissues with improved fluorescence signal 10-50 times higher than the widely used tyramide (TSA) reagents. In combination with our superior iFluor® dyes that have higher fluorescence intensity, increased photostability and enhanced water solubility, the iFluor® dye-labeled Styramide™ conjugates can generate fluorescence signal with significantly higher precision and sensitivity (more than 100 times) than standard ICC/IF/IHC. PSA utilizes the catalytic activity of horseradish peroxidase (HRP) for covalent deposition of fluorophores in situ. PSA radicals have much higher reactivity than tyramide radicals, making the PSA system much faster, more robust and sensitive than the traditional TSA reagents. Compared to tyramide reagents, the Styramide™ conjugates have ability to label the target at higher efficiency and thus generate significantly higher fluorescence signal. Styramide™ conjugates also allow significantly less consumption of primary antibody compared to standard directly conjugate method or tyramide amplification with the same level of sensitivity. Biotin Styramide is a superior replacement for biotin tyramide that is widely used in the well-known tyramide signal amplifications (TSA).

### AT A GLANCE

#### Protocol Summary

1. Fix/permeabilize/block cells or tissue
2. Add primary antibody in blocking buffer
3. Add HRP-conjugated secondary antibody
4. Prepare Styramide™ working solution and apply in cells or tissue for 5-10 minutes at room temperature

### PREPARATION OF STOCK SOLUTIONS

*Unless otherwise noted, all unused stock solutions should be divided into single-use aliquots and stored at -20 °C after preparation. Avoid repeated freeze-thaw cycles*

#### Styramide™ stock solution (100X)

Add 100 µL of DMSO into the vial of Biotin-labeled Styramide™ conjugate to make 100X Styramide™ stock solution.

**Note:** Make single-use aliquots and store unused 100X stock solution at -20 °C in a dark place. Avoid repeat freeze-thaw cycles.

#### Hydrogen peroxide stock solution (100X)

Add 10 µL of 3% hydrogen peroxide (not provided) to 90 µL of ddH<sub>2</sub>O.

**Note:** Prepare the 100X H<sub>2</sub>O<sub>2</sub> solution fresh on the day of use.

### PREPARATION OF WORKING SOLUTION

#### Styramide™ working solution (1X)

Every 1 mL of Reaction Buffer requires 10 µL of Styramide™ stock solution and 10 µL of H<sub>2</sub>O<sub>2</sub> stock solution.

**Note:** The Styramide™ provided is enough for 100 tests based on 100 µL of Styramide™ working solution needed per coverslip or per well in

a 96-well microplate.

**Note:** The Styramide™ working solution must be used within 2 hours after preparation and avoid direct exposure to light.

#### Secondary antibody-HRP working solution

Make appropriate concentration of secondary antibody-HRP working solution as per the manufacturer's recommendations.

### SAMPLE EXPERIMENTAL PROTOCOL

This protocol is applicable for both cells and tissues staining.

#### Cell fixation and permeabilization

1. Fix the cells or tissue with 3.7% formaldehyde or paraformaldehyde, in PBS at room temperature for 20 minutes.
2. Rinse the cells or tissue with PBS twice.
3. Permeabilize the cells with 0.1% Triton X-100 solution for 1-5 minutes at room temperature.
4. Rinse the cells or tissue with PBS twice.

#### Tissue fixation, deparaffinization and rehydration

Deparaffinize and dehydrate the tissue according to the standard IHC protocols. Perform antigen retrieval with the preferred specific solution/protocol as needed. A protocol can be found at:

<https://www.aatbio.com/resources/guides/paraffin-embedded-tissue-immunohistochemistry-protocol.html>

#### Peroxidase labeling

1. Optional: Quench endogenous peroxidase activity by incubating cell or tissue sample in peroxidase quenching solution (such as 3% hydrogen peroxide) for 10 minutes. Rinse with PBS twice at room temperature.
2. Optional: If using HRP-conjugated streptavidin, it is advisable to block endogenous biotins by biotin blocking buffer.
3. Block with preferred blocking solution (such as PBS with 1% BSA) for 30 minutes at 4 °C.
4. Remove blocking solution and add primary antibody diluted in recommended antibody diluent for 60 minutes at room temperature or overnight at 4 °C.
5. Wash with PBS three times for 5 minutes each.
6. Apply 100 µL of the secondary antibody-HRP working solution to each sample and incubate for 60 minutes at room temperature.

**Note:** Incubation time and concentration can be varied depending on the signal intensity.

7. Wash with PBS three times for 5 minutes each.

#### Styramide™ labeling

1. Prepare and apply 100  $\mu$ L of Styramide™ working solution to each sample and incubate for 5-10 minutes at room temperature.

**Note:** If you observe a non-specific signal, you can shorten the incubation time with Styramide™. You should optimize the incubation period using positive and negative control samples at various incubation time points. Or you can use a lower concentration of Styramide™ in the working solution.

2. Rinse with PBS three times.

### Counterstain and fluorescence imaging

1. Counterstain the cell or tissue samples as needed. AAT provides a series of nucleus counterstain reagents as listed in Table 1. Follow the instruction provided with the reagents.

2. Mount the coverslip using a mounting medium with anti-fading properties.

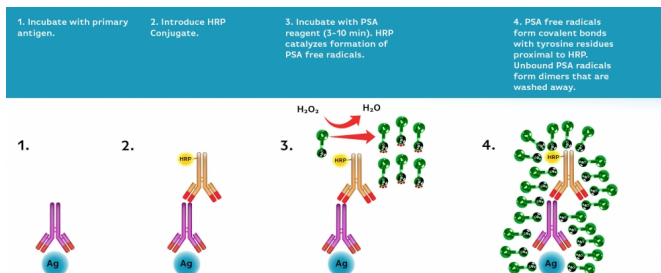
**Note:** To ensure optimal results, it is recommended to use either ReadUse™ microscope mounting solution (Cat. 20009) or FluoroQuest™ TSA/PSA Antifade Mounting Medium \*Optimized for Tyramide and Styramide Imaging\* (Cat. 44890) instead of Vectashield® mounting media. There are instances where Vectashield® mounting media may not be suitable for certain TSA/PSA conjugates.

3. Use the appropriate filter set to visualize the signal from the Styramide labeling.

**Table 1.** Products recommended for nucleus counterstain.

Cat#	Product Name	Ex/Em (nm)
17548	Nuclear Blue™ DCS1	350/461
17550	Nuclear Green™ DCS1	503/526
17551	Nuclear Orange™ DCS1	528/576
17552	Nuclear Red™ DCS1	642/660

### EXAMPLE DATA ANALYSIS AND FIGURES



**Figure 1.** Power Styramide™ Signal Amplification (PSA™) system is one of the most sensitive methods that can detect extremely low-abundance targets in cells and tissues with improved fluorescence signal 10-50 times higher than the widely used tyramide (TSA) reagents. In combination with our superior iFluor® dyes that have higher fluorescence intensity, increased photostability and enhanced water solubility, the iFluor® dye-labeled Styramide™ conjugates can generate fluorescence signal with significantly higher precision and sensitivity (more than 100 times) than standard ICC/IF/IHC. PSA utilizes the catalytic activity of horseradish peroxidase (HRP) for covalent deposition of fluorophores in situ. PSA radicals have much higher reactivity than tyramide radicals, making the PSA system much faster, more robust and sensitive than the traditional TSA reagents.

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