

**trFluor™ HWS Eu succinimidyl ester  
\*Europium complex\***

 Catalog number: 1447  
 Unit size: 1 mg

Component	Storage	Amount (Cat No. 1447)
trFluor™ HWS Eu succinimidyl ester *Europium complex*	Freeze (< -15 °C), Minimize light exposure	1 mg

**OVERVIEW**

trFluor™ HWS Eu succinimidyl ester is a europium-based fluorescent probe optimized for time-resolved fluorometry (TRF). Europium probes exhibit long emission lifetimes and large Stokes shifts, allowing delayed fluorescence detection that minimizes interference from short-lived autofluorescence commonly observed in biological samples. The HWS (Highly Water-Soluble) formulation provides improved aqueous solubility compared to other similar commercially available europium dye complexes, supporting efficient conjugation and reduced aggregation during labeling reactions. The succinimidyl ester functional group reacts with primary amines on proteins, antibodies and other biomolecules to form stable covalent conjugates. These properties make trFluor™ HWS Eu succinimidyl ester suitable for sensitive immunoassays and other fluorescence-based detection systems that require low background and time-resolved measurement capability.

**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*

**Protein stock solution (Solution A)**

- Mix 100 µL of a reaction buffer (e.g., 1 M sodium carbonate solution or 1 M phosphate buffer with pH ~9.0) with 900 µL of the target protein solution (e.g., antibody, protein concentration >2 mg/mL if possible) to give 1 mL protein labeling stock solution.

**Note:** The pH of the protein solution (Solution A) should be 8.5 ± 0.5. If the pH of the protein solution is lower than 8.0, adjust the pH to the range of 8.0-9.0 using 1 M sodium bicarbonate solution or 1 M pH 9.0 phosphate buffer.

**Note:** The protein should be dissolved in 1X phosphate-buffered saline (PBS), pH 7.2-7.4. If the protein is dissolved in Tris or glycine buffer, it must be dialyzed against 1X PBS, pH 7.2-7.4, to remove free amines or ammonium salts (such as ammonium sulfate and ammonium acetate) that are widely used for protein precipitation.

**Note:** Impure antibodies or antibodies stabilized with bovine serum albumin (BSA) or gelatin will not be labeled well. The presence of sodium azide or thimerosal might also interfere with the conjugation reaction. Sodium azide or thimerosal can be removed by dialysis or spin column for optimal labeling results.

**Note:** The conjugation efficiency is significantly reduced if the protein concentration is less than 2 mg/mL. For optimal labeling efficiency, the final protein concentration range of 2-10 mg/mL is recommended.

**trFluor™ HWS Eu succinimidyl ester stock solution (Solution B)**

- Add anhydrous DMSO into the vial of trFluor™ HWS Eu succinimidyl ester to make a 10 mM stock solution. Mix well by pipetting or vortex.

**Note:** Prepare the dye stock solution (Solution B) before starting

the conjugation. Use promptly. Extended storage of the dye stock solution may reduce the dye activity. Solution B can be stored in the freezer for two weeks when kept from light and moisture. Avoid freeze-thaw cycles.

**SAMPLE EXPERIMENTAL PROTOCOL**

This labeling protocol is specifically optimized for the conjugation of goat anti-mouse IgG with trFluor™ HWS Eu succinimidyl ester. Further optimization may be required for other proteins.

**Note:** Each protein requires a distinct dye/protein ratio, which also depends on the properties of dyes. Over-labeling of a protein could detrimentally affect its binding affinity while the protein conjugates of low dye/protein ratio give reduced sensitivity.

**Run conjugation reaction**

- Use a 10:1 molar ratio of Solution B (dye)/Solution A (protein) as a starting point. Add 5 µL of the dye stock solution (Solution B, assuming the dye stock solution is 10 mM) into the vial of the protein solution (95 µL of Solution A) with effective shaking. The concentration of the protein is ~0.05 mM assuming the protein concentration is 10 mg/mL and the molecular weight of the protein is ~200KD.

**Note:** We recommend using a 10:1 molar ratio of Solution B (dye)/Solution A (protein). If it is too low or too high, determine the optimal dye/protein ratio at 5:1, 15:1, and 20:1, respectively.

- Continue to rotate or shake the reaction mixture at room temperature for 30-60 minutes.

**Purify the conjugation**

The following protocol is an example of dye-protein conjugate purification by using a Sephadex G-25 column.

- Prepare Sephadex G-25 column according to the manufacture instruction.
- Load the reaction mixture (From "Run conjugation reaction") to the top of the Sephadex G-25 column.
- Add PBS (pH 7.2-7.4) as soon as the sample runs just below the top resin surface.
- Add more PBS (pH 7.2-7.4) to the desired sample to complete the column purification. Combine the fractions that contain the desired dye-protein conjugate.

**Note:** For immediate use, the dye-protein conjugate needs to be diluted with staining buffer, and aliquoted for multiple uses.

**Note:** For longer-term storage, the dye-protein conjugate solution needs to be concentrated or freeze-dried.

## EXAMPLE DATA ANALYSIS AND FIGURES

### Characterize the Desired Dye-Protein Conjugate

The Degree of Substitution (DOS) is the most important factor for characterizing dye-labeled protein. Proteins of lower DOS usually have weaker fluorescence intensity, but proteins of higher DOS (e.g. DOS > 6) tend to have reduced fluorescence too. The optimal DOS for most antibodies is recommended between 2 and 10 depending on the properties of dye and protein. For effective labeling, the degree of substitution should be controlled to have 6-8 moles of trFluor™ HWS Eu succinimidyl ester to one mole of antibody. The following steps are used to determine the DOS of trFluor™ HWS Eu succinimidyl ester labeled proteins.

### Measure absorption

To measure the absorption spectrum of a dye-protein conjugate, it is recommended to keep the sample concentration in the range of 1-10 µM depending on the extinction coefficient of the dye.

### Read OD (absorbance) at 280 nm and dye maximum absorption (λ<sub>max</sub> = 346 nm for trFluor™ HWS Eu succinimidyl ester dyes)

For most spectrophotometers, the sample (from the column fractions) needs to be diluted with de-ionized water so that the OD values are in the range of 0.1 to 0.9. The O.D. (absorbance) at 280 nm is the maximum absorption of protein while 346 nm is the maximum absorption of trFluor™ HWS Eu succinimidyl ester. To obtain accurate DOS, make sure that the conjugate is free of the non-conjugated dye.

### Calculate DOS

You can calculate DOS using our tool by following this link: <https://www.aatbio.com/tools/degree-of-labeling-calculator>

## DISCLAIMER

AAT Bioquest provides high-quality reagents and materials for research use only. For proper handling of potentially hazardous chemicals, please consult the Safety Data Sheet (SDS) provided for the product. Chemical analysis and/or reverse engineering of any kit or its components is strictly prohibited without written permission from AAT Bioquest. Please call 408-733-1055 or email [info@aatbio.com](mailto:info@aatbio.com) if you have any questions.