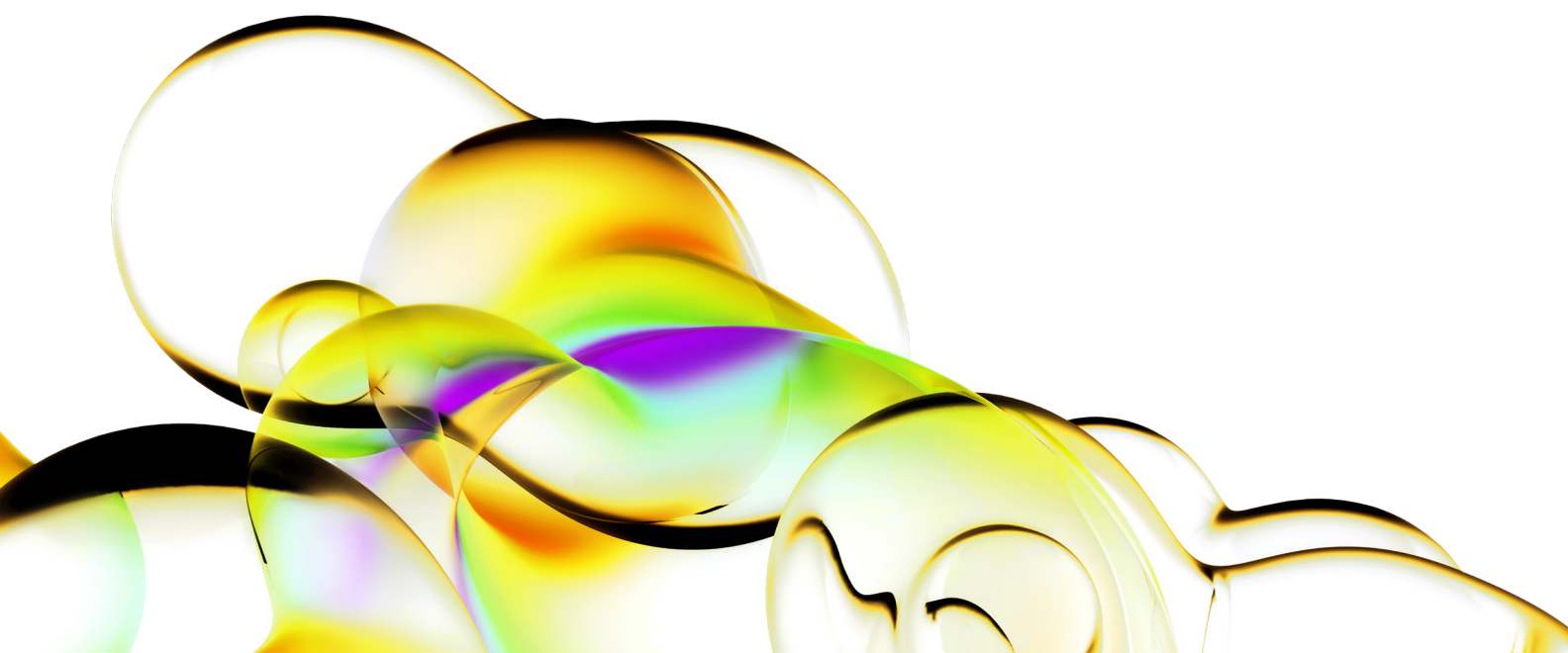


Antibody and protein near infrared (NIR) labeling with IVISense 645 NHS dye (NEV11173 & NEV11174).

Introduction

IVISense™ NHS 645 is a red fluorescent labeling dye containing an N-hydroxysuccinimide (NHS)-ester. Labeling dyes, such as IVISense 645 NHS, are commonly used for labeling proteins. The NHS ester moiety on IVISense 645 NHS dye reacts with amino groups to form amide bonds. Lysines within proteins, including antibodies, are available as targets for this chemical conjugation.

Protein labeling efficiency may vary depending upon the type of protein labeled, so different conjugation ratios may need to be attempted to attain success. For red fluorophore conjugation, ratios of fluorophore to protein of 4:1 have been seen to generate effective imaging agents. Not all antibodies or proteins (independent of target specificity) make good imaging agents, due to long half-lives and/or excessive accumulation in non-target sites.



General protocol for labeling an antibody with IVISense 645 NHS dye

Materials required

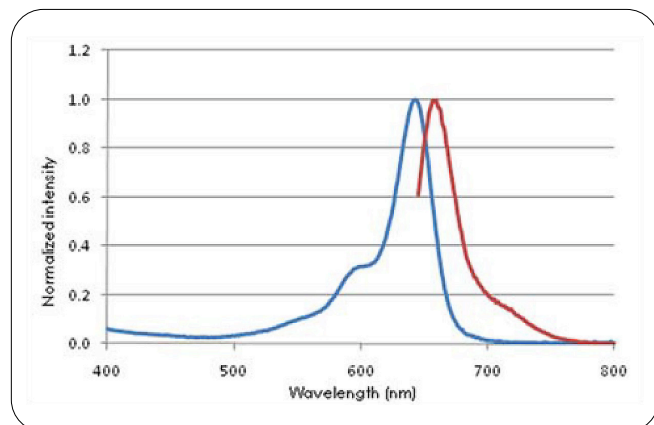
- Dimethylsulfoxide
 - Conjugation Buffer:
 - 50 mM carbonate/bicarbonate buffer, pH 8.5
1. Prepare 1 mL of a 1 mg/mL solution of antibody in conjugation buffer.
 2. Reconstitute 1 mg of IVISense 645 NHS dye with 100 μ L DMSO.
 3. Add 10 μ L of IVISense 645 NHS dye to protein solution, mix well. **Note:** *It may be advisable to optimize conjugation amounts depending on the protein to be labeled.*
 4. Incubate at room temperature for 1 hour.
 5. Remove non-reacted fluorophore by size exclusion chromatography (BioRad, Bio-Gel P-100).
 6. Sterile filter through a 0.2 μ M syringe filter.
 7. Store labeled protein at 4 °C in the dark until ready to analyze.

Extinction coefficients

	Dye	IgG
Epsilon	210,000 A/M	210,000 A/M

Absorbance 280 is 5% of absorbance 643.

Optical absorbance/emission spectra of IVISense 645 NHS dye



Calculations of conjugation ratio

Take the wavelength absorbance readings of a 1:10 dilution of your conjugate at 643 nM (detects fluorophore) and 280 nM (detects protein and some small contribution of fluorophore) blanked against PBS. Fluorophore absorbance at 280 nM (A280) for IVISense 645 NHS dye is 5% of the absorbance at 643 nM (A643).

1. Multiply A280 and A643 results by the dilution factor (10).
2. To accurately determine the correct A280 (i.e. adjust for fluorophore crosstalk), multiply the A643 value by the percent of crosstalk for the appropriate fluorophore. Subtract this value from the A280. This gives you a more accurate protein absorbance (i.e. the portion due to protein absorbance only).
3. Calculate protein concentration based on the extinction coefficient (in absorption units per Molar [M] concentration [A/M]) for your relevant protein, using the corrected A280. Convert protein concentration to M units.
4. Calculate fluorophore concentration using the extinction coefficient of your fluorophore.
5. The ratio of the fluorophore and protein molar concentrations will give you the F:P ratio (fluorescence to protein ratio).

Example calculations for IVISense 645 NHS dye

Antibody conjugation

	PBS	Ab	Comment
A280	0	1.3	Absorbance at 280 nM
Corrected A280		1.138	Corrects A280 based upon A643
A643	0	3.25	Absorbance at 643 nM
Protein (M)		5.42×10^{-6}	A280/210,000
Protein (mg/mL)		0.813	Convert M to mg/mL (IgG MW = 150,000)
Dye (M)		1.54×10^{-5}	A643/210,000
Dye:Protein M ratio		2.85	Ratio of Dye to Protein M values

Notes

Revvity's IVISense 645 NHS dye is intended for research purposes only and is not for human use. It must be used by or directly under the supervision of a technically qualified individual experienced in handling potentially hazardous materials. Please read the Material Safety Data Sheet (MSDS) provided for this product.

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