Product number: K8-1342
Product name: Seta-670-NHS

General Data

Molecular Mass: 966.07
Solubility: Water, Alcohol, DMF, DMSO
Insoluble: Acetone, Chloroform, Toluene
Storage: Store out of light, desiccated and refrigerate

Description

- High hydrophilic, amine-reactive fluorescent label containing one reactive NHS-ester group

Applications

- Covalent labeling of proteins, amino-modified DNA and amino-modified oligonucleotides
- Fluorescence Lifetime Label — this label exhibits a distinct lifetime change upon binding to a biomolecule
- Fluorescence Resonance Energy Transfer (FRET) applications
- Single Molecule Applications — Seta-670 shows extreme low blinking in single molecule measurements
- Flow Cytometry
- Immunofluorescence
- Gene Expression
- Homogeneous Assays
- Assessment of protein structure

Advantages

- Perfectly suited for excitation with the 380, 404, 635, 670-nm diode lasers, LEDs, and UV light
- Sensitive; high extinction coefficients and high quantum yields up to 50% after covalent attachment to proteins
- Quantum yield is highly increased after covalently attachment to proteins and other biomolecules
- pH-insensitive between pH 3 and pH 10
- Good aqueous solubility; this label does not alter the solubility of the protein conjugate
- High photostability; e.g. compared to fluorescein or Cy5™
- Low molecular weight — Seta dyes do not add substantial mass to the conjugates
- Ideal for non-radioactive labeling of proteins, amino-modified DNA probes and amino-modified oligonucleotides
**Spectral Data**

**Solvent System:** phosphate buffer pH 7.4

<table>
<thead>
<tr>
<th>Sample</th>
<th>Dye-to-protein Ratio</th>
<th>Absorption max. [nm]</th>
<th>Extinction Coefficient [M⁻¹·cm⁻¹]</th>
<th>Fluorescence max. [nm]</th>
<th>Quantum Yield [%]</th>
<th>Luminescence Lifetime at 25 ºC [ns]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free dye</td>
<td>—</td>
<td>667</td>
<td>180,000</td>
<td>688</td>
<td>7</td>
<td>0.42±0.03</td>
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<tr>
<td>BSA conjugate 1</td>
<td>0.5</td>
<td>681</td>
<td></td>
<td>695</td>
<td>45</td>
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<tr>
<td>BSA conjugate 2</td>
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<td>696</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>BSA conjugate 3</td>
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<td></td>
<td>696</td>
<td>27</td>
<td>2.43±0.03</td>
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<tr>
<td>IgG conjugate 4</td>
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<td>673</td>
<td></td>
<td>693</td>
<td>12</td>
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</tr>
<tr>
<td>IgG conjugate 6</td>
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<td>670</td>
<td></td>
<td>693</td>
<td>2</td>
<td>0.85±0.03</td>
</tr>
</tbody>
</table>

1. Excitation at 635 nm. Cy5 in phosphate buffer pH 7.4 (QY = 27% [1]) was taking as a reference.
2. **Seta-670—Carboxy** in phosphate buffer pH 7.4 vs. Alexa 647 in water (1.04 ns [2]); T = 25 ºC; ISS Chronos FD; excitation 635 nm (laser); bandpass filter 640 nm; longpass filter 670 nm; \( \tau_{\text{mean}} = 0.42 \) ns; \( \chi^2 = 0.92; \tau_1 = 0.38 \) ns; \( \tau_2 = 1.32 \) ns; \( f_1 = 0.96; f_2 = 0.04. \)
3. **Seta-670—BSA conjugate** (D/P = 1.5) in phosphate buffer pH 7.4 vs. Alexa 647 in water (1.04 ns [2]); T = 25 ºC; ISS Chronos FD; excitation 635 nm (laser); bandpass filter 640 nm; longpass filter 670 nm; \( \tau_{\text{mean}} = 2.43 \) ns; \( \chi^2 = 2.17; \tau_1 = 0.71 \) ns; \( \tau_2 = 3.12 \) ns; \( f_1 = 0.29; f_2 = 0.71. \)
4. **Seta-670—IgG conjugate** (D/P = 5.0) in phosphate buffer pH 7.4 vs. Alexa 647 in water (1.04 ns [2]); T = 25 ºC; ISS Chronos FD; excitation 635 nm (laser); bandpass filter 640 nm; longpass filter 670 nm; \( \tau_{\text{mean}} = 0.85 \) ns; \( \chi^2 = 2.35; \tau_1 = 0.26 \) ns; \( \tau_2 = 2.13 \) ns; \( f_1 = 0.69; f_2 = 0.31. \)

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**Absorption and emission spectrum of Seta-670 in phosphate buffer (pH 7.4)**

**Absorption and emission spectrum of Seta-670—BSA conjugate in phosphate buffer (pH 7.4) (Dye-to-protein ratio 1.0)**

**Quantum Yield vs. Dye-to-protein Ratio of Seta-670 — BSA conjugates in phosphate buffer (pH 7.4)**

**Relative Intensity vs. Dye-to-Protein Ratio of Seta-670 — IgG conjugates in phosphate buffer (pH 7.4)**
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**Relative decrease of the long-wavelength absorption band of Seta-670 as compared to Cy5 and Alexa 647 upon irradiation with a Xenon lamp**

**Relative decrease of the emission of Seta-670 as compared to Cy5 and Alexa 647 upon irradiation with a Xenon lamp**

**Single molecule applications:** Seta-670-mono-NHS, a dye that has been recently used in single molecule, homo-FRET measurements showed a remarkably low blinking effect which is an important factor in such measurements [1].


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