

DATASHEET

Atto390-Actin

From bovine cardiac muscle
(α -cardiac actin)

For Use in Research Only.
Not for Use in Diagnostic Processes.

Quantity: 1x100 μ g
Cat.#: 8252-01
Quantity: 5x100 μ g
Cat.#: 8252-02

Product Description

G-actin from bovine cardiac muscle is a single chain polypeptide with a molecular mass of 42kD consisting of 375 amino acids. Atto390-Actin is chemically modified G-actin by coupling of NHS-Atto 390 to lysine residues. The protein/dye molar ratio of Atto390-Actin is 1:0.90. Atto390-Actin is supplied as a lyophilized powder containing 2mM Tris-Cl pH 8.2, 0.4mM ATP and 0.1mM DTT, 0.08mM CaCl₂ and 0.6% disaccharides when reconstituted with H₂O to a 1mg/ml solution. The DOL of Atto390-Actin is stated in the Datasheet shipped with the product.

For dilution of G-actin or exchange of ligand buffer into actin compatible buffer, MonoMix (Cat no.: 5100-0*) may be used. In the absence of nucleators, the polymerization of G-actin can be initiated by PolyMix (Cat no.: 5000-0*).

Product Handling

Preparation of a working stock

Example: Add 100 μ l of H₂O to a vial with 100 μ g Atto390-Actin to obtain a working stock of 1mg/ml (23 μ M) and vortex for 30secs. The final concentration of G-actin should not exceed 3mg/ml. Allow the G-actin solution to rehydrate for 5min at room temperature, dissolve the pellet by pipetting several times up and down to obtain a homogeneous, yellowish Atto390-Actin solution. Leave to fully rehydrate for another 2 min, vortex for 30secs and spin 1min, 15.000xg. For standard applications the Atto390-Actin working stock is ready to use.

For critical assays the working stock should at least be dialyzed (100vol. of MonoMix, O/N) followed by high-speed centrifugation. For less critical assays the actin working stock may be filtered (0.2-0.45 μ m) or pre-spun (15.000rpm, 10min).

For product inquiries please contact:

cusserv@hypermol.com
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Product Storage and Stability

For best product performance Atto390-Actin is stored as supplied at -70° for six months. Once dissolved, Atto390-Actin is kept protected from light and on ice. Under these conditions the monomeric actin conjugate is stable for 5 days and for 2 weeks in the polymerized state. Avoid refreezing of solubilised, monomeric Atto390-Actin and do not refreeze F-actin.

Specifications of Atto390-Actin

Esterification of α -cardiac actin with Atto390 (Abs._{max.} 390 nm; Em._{max.} 479 nm) results in a chemically modified G-actin. Covalent conjugation of the fluorescent dye results in a net electrical charge of 0 and increases the molecular mass of actin to be ~ 43 kD. Atto390-actin possesses the polymerization properties of native actin as determined by viscometry and analytical high-speed cosedimentation.

Determining the Degree of Labeling (DOL)

1. Protein Concentration

Determination of the protein concentration by UV-VIS of nucleotide binding proteins is affected by the presence of nucleotides in buffer and protein. Nucleotides strongly absorb at 280nm. Minor variations in buffer composition result in erroneous measurements. For a correct UV-VIS measurement actin should be measured at 290nm ($\epsilon=26,600 \text{ M}^{-1}\text{cm}^{-1}$), after exchange of buffer against the reference buffer.

2. Degree of Labelling

The degree of labeling (DOL or dye/protein ratio) is usually determined by absorption spectroscopy making use of the Lambert-Beer law: Absorbance (A) = extinction coefficient (ϵ) \times molar concentration \times path length (d). Simply measure the UV-VIS spectrum of the conjugate in solution in a quartz cuvette. Dilute the solution, if necessary to measure within the linear range.

$$\text{DOL} = \frac{A_{\text{max}} / \epsilon_{\text{max}}}{A_{\text{prot}} / \epsilon_{\text{prot}}} = \frac{A_{\text{max}} \cdot \epsilon_{\text{prot}}}{A_{280} - (A_{\text{max}} \cdot \text{CF}_{280}) \cdot \epsilon_{\text{max}}}$$

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A_{\max} = maximal absorbance at 390nm of the dye measured in a cuvette with a pathlength of 1 cm).

ϵ_{prot} = 26,600 M⁻¹cm⁻¹ (molar decadic extinction coefficient at the longest-wavelength absorption maximum).

ϵ_{max} = 24,000 M⁻¹cm⁻¹ (molar decadic extinction coefficient at the longest-wavelength absorption maximum).

CF₂₉₀ = 0.05 (CF₂₈₀ = $\epsilon_{280}/\epsilon_{\text{max}}$. Correction factor to calculate the degree of labeling (DOL) of dye-protein conjugates).

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