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Product Information: ATTO 540Q

ATTO 540Q is a novel fluorescence quencher (energy acceptor in FRET process). The quencher is designed for application in the area of life science, e.g. labeling of DNA, RNA or proteins. Characteristic features of the label are strong absorption and high stability.

ATTO 540Q is a cationic dye. After coupling to a substrate the dye carries a net electrical charge of +1. As supplied **ATTO 540Q** consists of a mixture of two isomers with practically identical absorption. For details of coupling see our recommended labeling procedure at www.atto-tec.com - Support - Downloads - [General Procedures](#).

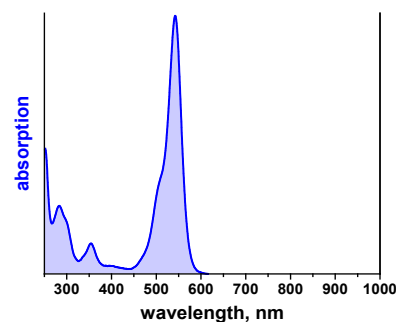
Optical data of the carboxy derivative (in PBS, pH 7.4):

$$\lambda_{\text{abs}} = 543 \text{ nm}$$

$$\epsilon_{\text{max}} = 1.05 \times 10^5 \text{ M}^{-1} \text{ cm}^{-1}$$

$$\text{CF}_{260} = 0.27$$

$$\text{CF}_{280} = 0.26$$



Spectra available in digitized form (excel file) on

<http://www.atto-tec.com>

Modification	MW, g/mol	M ⁺ , g/mol	Order Code	
			Unit (1 mg)	Unit (5 mg)
carboxy	659	559	AD 540Q-21	AD 540Q-25
NHS-ester	756	656	AD 540Q-31	AD 540Q-35
maleimide	781	681	AD 540Q-41	AD 540Q-45
biotin	970	869	AD 540Q-71	AD 540Q-75
phalloidin	1443	1329	AD 540Q-81*	AD 540Q-82**
azide	873	759	AD 540Q-101	AD 540Q-105
hydrazide <i>new</i>	774	573	AD 540Q-121	AD 540Q-125
tetrazine (MeTet)	842	742	AD 540Q-2502 [#]	AD 540Q-2505 ^{##}

* 10 nmol **20 nmol #0.2 mg ##0.5 mg

General Information

Storage: The product is shipped solvent-free at ambient temperature. Upon receipt store at -20 °C. To avoid moisture condensation onto the product, vial must be equilibrated to room temperature before opening. When stored properly, protected from moisture and light, ATTO-TEC products are stable for at least three years.

Risk and safety: A material safety data sheet (MSDS) of each derivative can be downloaded from our website at www.atto-tec.com.

Solutions: The product is soluble in polar solvents, e.g. dimethylformamide (DMF), dimethylsulfoxide (DMSO), or acetonitrile. However, due to their inherent reactivity, NHS-esters and maleimides must be well protected from OH-containing solvents like ethanol and, in particular, water. Prepare labeling solutions of NHS-esters and maleimides immediately before use by dissolving the vial content in anhydrous and amine-free DMF or DMSO. Depending on the quality of the solvent used, such solutions may be of limited stability.

Dye with **free carboxy group (COOH)** may be used for any kind of spectroscopy. The dye can be activated at the carboxy group for coupling purposes.

The **NHS-ester** of the dye reacts easily with amino-groups of proteins and other bio-molecules. Since the amino-group must be non-protonated to be reactive, the pH of the reaction solution has to be adjusted sufficiently high. As with all NHS-esters unavoidable hydrolysis takes place at high pH and competes with the desired labeling reaction. Therefore the solution has to be buffered carefully. For details see the Labeling Protocol on www.atto-tec.com.

The **maleimide** is suitable for labeling sulfhydryl (thiol) groups of proteins, in particular cystein residues. See Labeling Protocol on www.atto-tec.com.

The **biotin** derivative can be used as reagent for binding to proteins like avidin and streptavidin.

Phalloidin, a bicyclic heptapeptide, is a very strong binding reagent to actin. Fluorescent labeled phalloidin has become a useful tool to investigate the distribution of F-actin within the cytoskeleton of cells by fluorescence microscopy. To prepare a stock solution of the phalloidin-conjugate it is recommended dissolving the sample in 1 ml of methanol.

The **azide** or **alkyne** modification is used in the Huisgen reaction ("Click Chemistry").

The **hydrazide** derivative is used to modify aldehydes and ketones.

The **tetrazine** derivative readily reacts in a bioorthogonal way with strained alkenes or alkynes such as trans-cyclooctenes (TCO) or cyclooctynes like bicyclo[6.1.0]non-4-yne (BCN), respectively.

Further Notes:

- ATTO-TEC products are high-quality reagents intended for research purposes only.
- The use of ATTO-TEC products must be supervised by technically qualified personnel experienced in handling potentially hazardous chemicals. For safety instructions please read the corresponding Material Safety Data Sheet.
- Most ATTO-TEC products and product applications are covered by European and foreign patents.
- Commercial use of ATTO-TEC products is not permitted without written agreement by ATTO-TEC GmbH. Inquiries for licensing may be directed to info@atto-tec.com.