

Product Data Sheet

Product Name: Sel-green

Cat. No.: GC61587

Chemical Properties

Cas. No. 1574299-37-8

SMILES O=S(C1=CC=C([N+])([O-])=O)C=C1[N+](O-)=O)(NC2=CC3=CC=C(N(CC)CC)C=C3OC2=O)=O

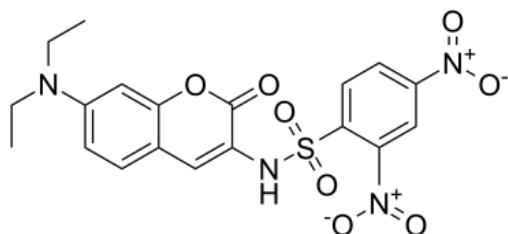
Formula $C_{19}H_{18}N_4O_8S$ M.Wt 462.43

Solubility Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

Application of the Sel-green Probe for Selenol Fluorescence Imaging in Live Cells [1]

This protocol is adapted from research data and provided for reference only. Adjustments may be necessary based on specific experimental requirements.

1. Reagent Preparation: Dissolve Sel-green in dimethyl sulfoxide (DMSO) to prepare a stock solution

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of an appropriate concentration (e.g., 5-10mM). Dilute with cell culture medium to a working concentration of 20 μ M before use. Prepare treatment solutions containing selenium compounds (e.g., Na₂SeO₃, (Sec)₂, etc.) using cell culture medium. The working concentration is typically 5 μ M. The complete medium contains 10% fetal bovine serum (FBS), 2mM glutamine, 100U/mL penicillin/streptomycin.

2. Cell Culture and Seeding: Perform routine culture of cells (e.g., HepG2, HeLa) in the aforementioned complete medium at 37°C with 5% CO₂. One day before the imaging experiment, seed cells at an appropriate density into 12- or 24-well plates, adding the appropriate volume of medium (e.g., 1mL for 12-well plates, 0.5mL for 24-well plates). Culture for 24 hours to allow cell attachment.

3. Cell Treatment and Probe Incubation:

(1) Induction of Endogenous Selenols: To detect endogenous selenocysteine (Sec), pre-treat cells with Na₂SeO₃ (5 μ M) for 1 hour or 12 hours before imaging to increase intracellular Sec levels.

(2) Detection of Exogenous Selenols: To detect exogenous Sec, treat cells with (Sec)₂ (5 μ M) for 1 hour.

(3) Metabolism Study of Different Selenium Compounds: Treat cells with the target selenium compounds (e.g., SeO₂, Na₂SeO₃, DBDS, etc.; 5 μ M) for 1, 6, or 12 hours. After treatment, wash the cells three times with pre-warmed PBS to remove residual compounds from the medium.

4. Fluorescence Imaging: Add freshly prepared Sel-green working solution (20 μ M in medium) to the washed cells. Incubate at 37°C in the dark for 30 minutes. After incubation, wash the cells three times with PBS to remove unincorporated probe. Immediately observe and capture images using a fluorescence imaging system. Sel-green produces green fluorescence with excitation/emission wavelengths of approximately 370/502nm.

Precautions:

(1) Sel-green is the first selective selenol probe that works under physiological conditions (pH=7.4). Its response signal to Sec is more than 100-fold higher than that to common biological thiols (e.g., Cys, GSH).

(2) A potential drawback of Sel-green is its relatively low sensitivity in cell imaging, which may limit its

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application in detecting low concentrations of endogenous selenols in vivo.

(3) For your safety and health, please wear a lab coat and disposable gloves during operation.

References:

[1] Zhang B, Ge C, Yao J, et al. Selective selenol fluorescent probes: design, synthesis, structural determinants, and biological applications. J Am Chem Soc. 2015 Jan 21;137(2):757-69.

Background

Sel-green is a selective fluorescent probe for selenol. Sel-green (with an excitation/emission wavelength of approximately 370/502nm) can be used to quantify the Sec content in the selenoenzyme thioredoxin reductase and to perform fluorescence imaging of Sec in live cells. Sel-green can be applied in related research on cancer and cell biology^[1].

References:

[1] Zhang B, Fang J. Assay of selenol species in biological samples by the fluorescent probe Sel-green. Methods Enzymol. 2022;662:259-273.

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