

Photosensitizer-7

Chemical Properties

CAS No. :

Formula:

Molecular Weight:

Storage: Powder: -20°C for 3 years | In solvent: -80°C for 1 year

Actual storage temperature shall be subject to the COA.

Biological Description

Description	Photosensitizer-7 is a photosensitizer (PS) that targets the endoplasmic reticulum (ER) with absorption and emission wavelengths at λ_{ab} = 610 nm and λ_{em} = 622 nm, respectively. Under illumination, it shows an IC ₅₀ of 4.006 μ M in HeLa cells and 3.28 μ M in MCF-7 cells. Photosensitizer-7 is taken up by cells in a dose-dependent manner and primarily colocalizes with the ER. Light exposure induces dose-dependent intracellular ROS generation, reduces mitochondrial membrane potential, and increases apoptosis. Furthermore, Photosensitizer-7 significantly inhibits tumor growth in MCF-7 tumor-bearing mice, making it a valuable candidate for photodynamic anti-cancer research applications.
Targets(IC ₅₀)	Apoptosis,ROS,Photosensitizer
In vitro	Photosensitizer-7 (Compound 4j) exhibits a maximum absorption at 610 nm with a molar extinction coefficient of 53,000 M ⁻¹ cm ⁻¹ . Its maximum fluorescence emission is at 622 nm, with a fluorescence quantum yield of 0.38 and a singlet oxygen quantum yield of 0.44. Under light exposure for 24 hours, the IC ₅₀ against HeLa cells is 4.006 μ M and 3.28 μ M for MCF-7 cells. In dark conditions, the IC ₅₀ is 19.93 μ M for HeLa cells and 135.9 μ M for MCF-7 cells. At concentrations of 2-8 μ M under dark conditions for 24 hours, Photosensitizer-7's impact on intracellular ROS generation in MCF-7 cells is negligible. However, light exposure significantly increases ROS levels in a dose-dependent manner. Furthermore, upon photoactivation, Photosensitizer-7 induces a dose-dependent reduction in mitochondrial membrane potential ($\Delta\Psi_m$) and enhances the apoptosis rate in MCF-7 cells.
In vivo	Photosensitizer-7 (Compound 4j), administered intraperitoneally at a dose of 5-40 mg/kg every three days for 21 days, did not induce any abnormal behavioral changes, significant weight differences, or pathological alterations in major organs (heart, liver, spleen, lungs, kidneys) in male ICR mice. Additionally, a single intratumoral injection of Photosensitizer-7 at 20-40 mg/kg significantly inhibited tumor growth in MCF-7 tumor-bearing female BALB/c nude mice.

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