Thioflavin T

Cat. No.: HY-D0218

CAS No.: 2390-54-7

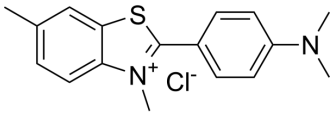
Molecular Formula: $C_{17}H_{19}ClN_2S$

Molecular Weight: 318.86

Target: Amyloid-β

Pathway: Neuronal Signaling

Storage: 4°C, sealed storage, away from moisture and light
* In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture and light)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 16.67 mg/mL (52.28 mM; Need ultrasonic)
H_2O : 5 mg/mL (15.68 mM; ultrasonic and warming and heat to 60°C)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	3.1362 mL	15.6809 mL	31.3617 mL
5 mM	0.6272 mL	3.1362 mL	6.2723 mL
10 mM	0.3136 mL	1.5681 mL	3.1362 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
Solubility: ≥ 1.67 mg/mL (5.24 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Thioflavin T is a cationic Benzothiazole dye that shows enhanced fluorescence upon binding to amyloid in tissue sections.

In Vitro

Thioflavin T (ThT) is a benzothiazole dye that exhibits enhanced fluorescence upon binding to amyloid fibrils and is commonly used to diagnose amyloid fibrils, both ex vivo and in vitro. In aqueous solutions, Thioflavin T is found to exist as micelles at concentrations commonly used to monitor fibrils by fluorescence assay (~10-20 μM). Specific conductivity changes are measured at varying concentration of Thioflavin T and the critical micellar concentration is calculated to be 4.0±0.5 μM. Changes in the fluorescence excitation and emission of Thioflavin T are also dependent on the micelle formation. The Thioflavin T micelles of 3 nm diameter are directly visualized using atomic force microscopy, and bound Thioflavin T micelles are observed along the fibril length for representative fibrils. Increasing concentration of Thioflavin T above the critical micellar concentration shows increased numbers of micelles bound along the length of the amyloid fibrils. Thioflavin T micelles are disrupted at low pH as observed by atomic force microscopy and fluorescence enhancement upon binding of Thioflavin T to amyloid fibrils also reduced by several-fold upon decreasing the pH to below 3.The micelles of

Thioflavin T bind amyloid fibrils leading to enhancement of fluorescence emission[1].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Kinase Assay [1]

Thioflavin T (ThT) is prepared by dissolving ~3 mg dry powder in 1 mL water. The solution is filtered through 0.22 μm syringe filters followed by measurement of the concentration by diluting the stock solution in ethanol and using an extinction coefficient of 26,620 M^{-1} cm^{-1} at 416 nm. The stock solution is stored at 4 °C covered with foil and used for up to a month to make assay solutions by diluting either in water or desired buffer[1].

Thioflavin T (ThT) fluorescence emission is measured with excitation at 450 nm and recording the spectrum between 465 and 565 nm with 5 nm slits using a FluoroMax 2 spectrofluorometer. The excitation spectra are collected by setting the emission wavelength to 482 nm and collecting the spectrum between 300 and 470 nm with 5 nm slit widths, and 1 s integration time and 1 nm interval. Emission spectra between 465 and 565 nm are collected upon excitation at 450 nm. Excitation and emission spectra in the presence of amyloid fibrils are measured with varying concentrations of Thioflavin T and 5 ng/mL amyloid (calculated based on starting protein concentration) before collecting the spectra[1].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Nat Commun. 2022 Mar 17;13(1):1444.
- Theranostics. 2022 Feb 28;12(6):2549-2559.
- PLoS Pathog. 2023 Jan 26;19(1):e1011131.
- Eur J Med Chem. 2020 Feb 1;187:111961.
- Mol Med. 2024 Mar 16.

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REFERENCES

[1]. Khurana R, et al. Mechanism of thioflavin T binding to amyloid fibrils. J Struct Biol. 2005 Sep;151(3):229-38.

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