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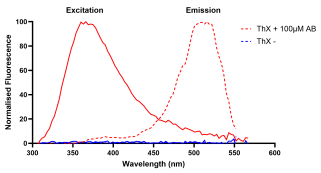
DATASHEET

Thioflavin X (ThX)

Product overview

Name	Thioflavin X (ThX)
Cat No	HB17774
Biological description	Novel, next generation blue-green, cell-permeable fluorescent amyloid stain. Shows 5x increase in brightness and 7x increase in binding affinity to amyloidogenic proteins (α-syn) to display superior photophysical and binding properties compared to Thioflavin T (ThT). Thioflavin X (ThX) outperforms Thioflavin T as a single-aggregate probe of β-Amyloid Peptide (1-42) (human) and P301S tau as ThX is able to detect greater numbers of fluorescent species of each than ThT. Unlike Thioflavin T, Thioflavin X (ThX) can be used for monitoring structural changes of amyloid β oligomers. The improved optical properties (extinction coefficient, quantum yield and brightness) of Thioflavin X (ThX) allow monitoring of structural differences in oligomeric species which is not observable with Thioflavin T imaging. It is suitable for studying unique structural amyloid features in bulk and on a single-aggregate level and also allows detection of amyloid β-sheet species at the early stages of protein aggregation. Also used to super-resolve the structures of tau aggregates (especially early aggregate species with lengths under 100-200 nm). Suitable for use in super-resolution microscopy with ~20nm resolution. β-Amyloid Peptide (1-42) (human) also available.
Species of origin	Synthetic
Biological action	Dyes & stains
Purity	>97%
Description	Next generation, cell-permeable fluorescent amyloid stain with superior photophysical properties compared to Thioflavin T

Images



Biological Data

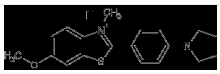
Application notes	Please see our Amyloid Beta Protocol

Solubility & Handling

Storage instructions	-20°C
Solubility overview	Soluble in DMSO (100mM) and in EtOH (10 mM)
Storage of solutions	Prepare and use solutions on the same day if possible. Store solutions at -20°C for up to one month if

Storage instructions	-20°C storage is required. Equilibrate to RT and ensure the solution is precipitate free before use.
Handling	Needham et al prepared stock solutions to 10mM in DMSO. These were then diluted into 0.02µM filtered PBS (pH 7.4) to the experimentally required concentration.
Shipping Conditions	Stable for ambient temperature shipping. Follow storage instructions on receipt.
Important	This product is for RESEARCH USE ONLY and is not intended for therapeutic or diagnostic use. Not for human or veterinary use

Chemical Data

Chemical name	6-methoxy-3-methyl-2-(4-pyrrolidin-1-ylphenyl)-1,3-benzothiazol-3-ium iodide
Molecular Weight	452.35
Chemical structure	
Molecular Formula	$C_{19}H_{21}IN_2OS$
CAS Number	2683063-26-3
PubChem identifier	170907366
SMILES	[I-].COC1=CC2=C(C=C1)[N+](C)=C(S2)C1=CC=C(C=C1)N1CCCC1
Source	Synthetic
InChiKey	IJDBRVINIKHPDK-UHFFFAOYSA-M
Appearance	Orange solid
Excitation	420
Emission	494

References

Cavity Lasing Characteristics of Thioflavin T and Thioflavin X in Different Solvents and Their Interaction with DNA for the Controlled Reduction of a Light Amplification Threshold in Solid-State Biofilms.

Rusakov K et al (2023) ACS applied optical materials 1

PubMedID 38149104

ThX - a next-generation probe for the early detection of amyloid aggregates.

Needham LM et al (2020) Chemical science 11

PubMedID 34122915

Hyperphosphorylated tau self-assembles into amorphous aggregates eliciting TLR4-dependent responses.

Meng JX et al (2022) Nature communications 13

PubMedID 35577786