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# DATASHEET

Thioflavin X (ThX)

## Product overview

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| **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.<br><br>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.<br><br>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 |

## Biological Data

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| **Application notes** | Please see our Amyloid Beta Protocol |

## Solubility & Handling

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| **Storage instructions** | -20°C |
| **Solubility overview** | Soluble in DMSO (100mM) and in EtOH (10 mM) |
| **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. |
| **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

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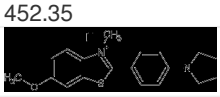
| **Chemical name** | 6-methoxy-3-methyl-2-(4-pyrrolidin-1-ylphenyl)-1,3-benzothiazol-3-ium iodide |
| **Molecular Weight** | 452.35 |
| **Chemical structure** |  |
| **Molecular Formula** | $C_{19}H_{21}IN_2OS$ |
| **CAS Number** | 2683063-26-3 |
| **PubChem identifier** | 170907366 |

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| **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