

Product Data Sheet

Product Name: HBC620
Cat. No.: GC60186

Chemical Properties

Cas. No. 2530162-07-1

SMILES OCCN(C)C1=CC(S2)=C(S1)C=C2/C=C(C#N)/C3=CC=C(C#N)C=C3

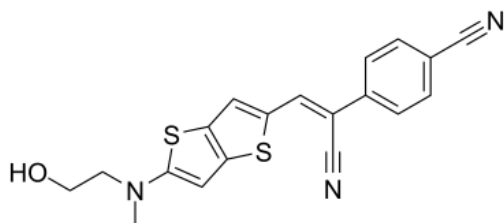
Formula $C_{19}H_{15}N_3OS_2$ M.Wt 365.47

Solubility DMSO:16.67 mg/mL (45.61 mM) Storage Store at -20°C, unstable in solution, ready to use.

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

HBC620-based In Vivo Mapping of a Tumor-Specific Protease

This protocol comes from the literature, please make modifications according to your specific needs.

1. Establish the xenograft tumor mouse model

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(1) Male BALB/c nude mice (6 weeks of age; weighing 18-20g); 1×10^6 B16 cells were injected subcutaneously into the right armpit of each mouse, and the tumor volume reached 80-100mm³ (about 7-8 days).

(2) Chimeric probes were administered to the tail vein of mice: CBD-miRFP-DCV chimeric probes were dissolved in 200μl PBS and slowly pushed at 29G of the tail vein for 30s (1nM/20g).

2. Preparation and application of HBC620

(1) 5μM HBC620 working solution was prepared from 0.5mM HBC620 stock solution (dissolved in PBS, filtered at 0.22μm), use immediately.

(2) After anesthesia, the mice were depilated, and 200μl HBC620 working solution (final dose 1nM/20g, 1:1 molar ratio to probe) was injected into the tail vein.

3. In vivo imaging analysis

(1) Real-time acquisition: 0min, 5min, 15min, 30min, 1h, 2h, 4h, 8h, 24h; Parameters: excitation wavelength at 570nm, emission wavelength at 650-680nm, exposure at 500ms, f/stop 2, field of view 12cm×12cm.

(2) Quantification: tumor ROI and ipsilateral back normal skin ROI were selected to calculate T/N ratio (tumor-to-normal ratio).

4. Caveats.

(1) Dark operation: HBC620 working solution has a half-life of 4h at 4°C, and is prepared and used on demand.

(2) The laser power was $\leq 0.5\text{W}/\text{cm}^2$ to prevent tissue thermal damage.

(3) If imaging needs to be repeated longitudinally, the interval is $\geq 48\text{h}$ to ensure that the first dye has been removed (24-hour urinary excretion > 85%).

References:

[1] Xie X, Sun Y, Peng J, et al. Collagen Anchoring Protein-Nucleic Acid Chimeric Probe for In Situ In Vivo Mapping of a Tumor-Specific Protease[J]. Analytical Chemistry, 2023, 95(50): 18487-18496.

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Background

HBC620 is an HBC-like fluorophore, a GFP fluorophore-like synthetic dye, with a maximum excitation wavelength of 577nm and a maximum emission wavelength of 620nm^[1]. HBC620 can be used as an RNA tag, which is bright, stable, and colorful, and capable of imaging a variety of RNAs in living cells^[2]. The unique fluorescence imaging channel provided by HBC620 has been widely used in the engineering of luminometric sensor platforms for multiple miRNA imaging^[3]. HBC620 can be used for in situ localization of tumor-specific protease and animal optical in vivo imaging analysis experiments^[4].

References:

- [1] Chen X, Zhang D, Su N, et al. Visualizing RNA dynamics in live cells with bright and stable fluorescent RNAs[J]. Nature Biotechnology, 2019, 37(11): 1287-1293.
- [2] Tang H, Peng J, Peng S, et al. Live-cell RNA imaging using the CRISPR-dCas13 system with modified sgRNAs appended with fluorescent RNA aptamers[J]. Chemical Science, 2022, 13(47): 14032-14040.
- [3] Yin P, Ge M, Xie S, et al. A universal orthogonal imaging platform for living-cell RNA detection using fluorogenic RNA aptamers[J]. Chemical Science, 2023, 14(48): 14131-14139.
- [4] Xie X, Sun Y, Peng J, et al. Collagen Anchoring Protein-Nucleic Acid Chimeric Probe for In Situ In Vivo Mapping of a Tumor-Specific Protease[J]. Analytical Chemistry, 2023, 95(50): 18487-18496.

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