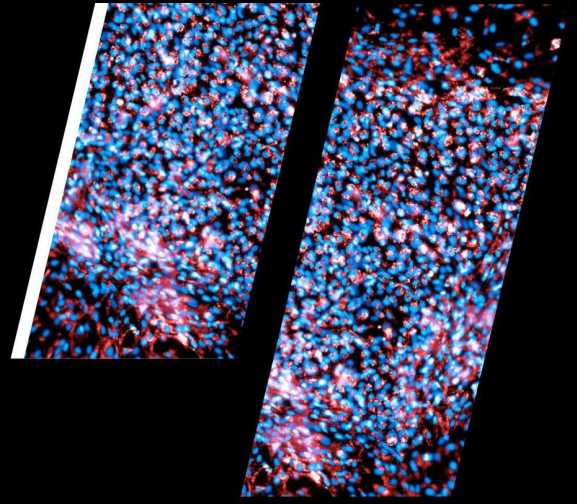


Make *i* Visible

We visualize what you need to see

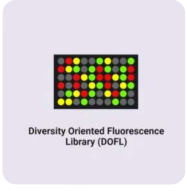
SENPRO

PRODUCT GUIDE BOOK VOL.01

SELECTIVITY, EFFICIENCY, NOVELTY FOR OUR PRODUCTS.
PROFESSIONALITY, RESPONSIBILITY, ORIGINALITY FOR OUR PEOPLE.

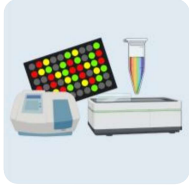
SENPRO stands for Sensors & Probes.

The basis of SENPRO technology is DOFLA (Diversity Oriented Fluorescence Library Approach), composed of more than 10,000 fluorescent molecule collection & high throughput imaging-based screening platform. **SENPRO** is the only company in the world, specialized in live-cell selective imaging probe development.
SENPRO provides fluorescent probes from stem cells and all kinds of differentiated cells, even to the aged cells. We also developed the most photostable organic dye ever reported to date, Phoenix Fluor (PF) and provides various functional PF reagents for chemical & biological labeling.



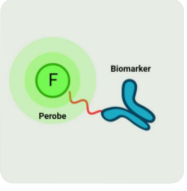
DOFL Development

Synthetic Team



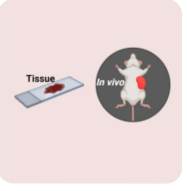
Probe Discovery

Screening Team



Biomarker Discovery

Mechanism Team

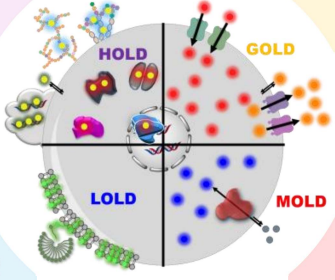


Ex vivo & In vivo Development

Application Team

For more information and to see all the SENPRO products available, visit www.senprobe.com

HOLD probes have binding biomarkers on or inside the target cells.



GOLD probes selectively enter or are excluded from target cells through specific transporters.

LOLD probes are loaded on the target cell membrane through a kinetically controlled membrane fusion.

MOLD probes selectively stain target cells through a unique metabolism.

SENPRO	SENPRO	SENPRO	SENPRO	SENPRO	SENPRO
· CDb8	· CDg4	· CDy1	· AGO	· CDr3	· ElaNIR
· JC-D7	· CDg13	· CDy5	· AGN	· CDr10a	· TiNIR
· JC-D8	· NeuM	· CDy9	· NeuO	· CDr10b	· CDnir7
· CDb12	· BD-Oligo	· 2C40	· BacGO	· CDr20	
· Histamine Blue	· 2E10	· PiY, PiF		· BD-Tau	
	· TP-alpha	· TiY		· TP-beta	
	· cLG	· CDy2		· hLR	
	· CDg16	· CDy6		· CDr17	
	· CDg18	· CDy11, CDy14		· CDr15	
	· CDgB	· MTX, MTY		· F22	
	· NeutropG	· Glucagon Yellow			
	· DNA-green	· ER ThermAC			
	· E36, E144	· ER Thermo Yellow			
	· CO-1	· PF555 series			

What is the quantity and concentration of the probe?

- **Probes**: **100 nmol** (dried form: equivalent to 1 mM / 100 µL)
- **Phoenix fluor**: **10 nmol** (dried form: equivalent to 100 µM / 100 µL)

How should I store SENPRO's probes?

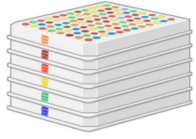
- **Dried compound**: Store at 4 °C or -20 °C.
- **DMSO stock solution**: after aliquoting, store at -20 °C or -80 °C.
- **After dilution in aqueous media**: use up within a day.

General Use Guide

- More than **1/100 dilution** of 10mM of DMSO stock solution is essential
- For biomedical use to avoid DMSO concentration higher than **1%**.
- Working concentrations for specific applications should be determined by the investigator.
- It is recommended to use up the buffer diluted solution within **one day**.
  The compound may be decomposed or precipitated out from buffer solution.

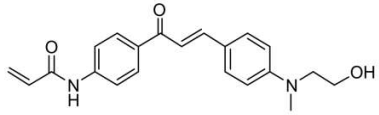
Order

- **International:** USD 350 + VAT (10%) + Fedex delivery charge
- **In Korea:** KRW 450,000 + VAT (10%)



CDg4
Cat. No. P004

■ **Chemical structure**



Order: www.senprobe.com/CDg4

■ **Known Property:** Mouse embryonic stem cell (mES) probe

■ **Molecular Weight:** 350.42 ($C_{21}H_{22}N_2O_3$)

■ **λex / λem:** 430 / 560nm

■ **Application:** Immunofluorescence

■ **Cell selectivity mechanism:** COLD (maybe glycogen)

■ **Related probes:** CDy1, CDg8, CDy9

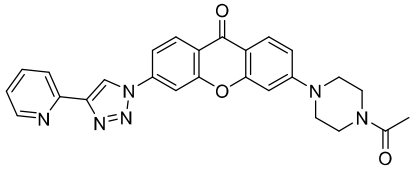
CDg4 (Compound of Designation green 4) is a chalcone based green fluorescent probe for mouse embryonic stem cell (mES). **CDg4** stains the outside of mES colony, i.e. glycocalyx area. Glycocalyx is enriched with glycoproteins and glycolipids. The binding target of **CDg4** was identified as glycogen in glycocalyx, and the **CDg4** staining was diminished by amylase treatment. In contrast to mES colony, neurosphere lacks glycogen and is not stained by **CDg4**. The co-staining with related ES probes showed that CDy1 stains inside ES colony, and **CDg4** and CDb8 stain the surface of ES colony.

■ **Reference:**

1. **Development of fluorescent Chalcone library and its application in the discovery of a mouse embryonic stem cell probe**, Lee, S. C.; Kang, N. Y.; Park, S. J.; Yun, S. W.; Chandran, Y.; Chang, Y. T.* Chem. Commun. 2012, 48, 6681-6683.

CDb8
Cat. No. P008

■ **Chemical structure**



Order: www.senprobe.com/CDb8

■ **Known Property:** Mouse embryonic stem cell (mES) probe

■ **Molecular Weight:** 466.50 ($C_{26}H_{22}N_6O_3$)

■ **λex / λem:** 365 / 495 nm

■ **Application:** Immunofluorescence

■ **Cell selectivity mechanism:** COLD (maybe glycogen)

■ **Related probes:** CDy1, CDg4, CDy9

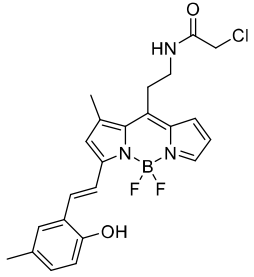
CDb8 (Compound of Designation blue 8) is a xanthone based blue fluorescent probe for mouse embryonic stem cell (mES). **CDb8** stains the outside of mES colony, i.e. glycocalyx area. Glycocalyx is enriched with glycoproteins and glycolipids. The co-staining with related ES probes showed that CDy1 stains inside ES colony, and CDg4 and CDb8 stains the surface of ES colony. Based on the imaging data, the binding target of **CDb8** may be glycogen in glycocalyx.

■ **Reference:**

1. **Solid phase combinatorial synthesis of xanthone library using click chemistry and its application to embryonic stem cell probe**, Ghosh, K. K; Ha, H. H.; Kang, N. Y.; Chandran, Y.; Chang, Y. T.* Chem. Commun. 2011, 47, 7488-7490
2. **Development of fluorescent Chalcone library and its application in the discovery of a mouse embryonic stem cell probe**, Lee, S. C.; Kang, N. Y.; Park, S. J.; Yun, S. W.; Chandran, Y.; Chang, Y. T.* Chem. Commun. 2012, 48, 6681-6683.

CDy9
Cat. No. P009

Chemical structure



Order: www.senprobe.com/CDy9

Known Property:	Mouse embryonic stem cell (mES) probe
Molecular Weight:	457.71 ($C_{23}H_{23}BClF_2N_3O_2$)
λex / λem:	563 / 578 nm
Application:	Immunofluorescence
Cell selectivity mechanism:	GOLD (SLC13A5)
Related probes:	CDy1, CDr3, CDb8

CDy9 (Compound of Designation yellow 9) is a highly selective mouse embryonic stem cell (mES) probe. The selectivity of **CDy9** was reduced when the chloroacetyl group was removed, while acetyl derivative maintained the selectivity.

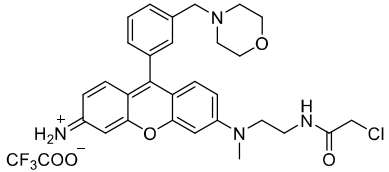
Reference:

1. **A highly selective fluorescent probe for direct detection and isolation of mouse embryonic stem cells**, Chandran, Y.; Kang, N. Y.; Park, S. J.; Husen, A. S.; Kim, J. Y.; Sahu, S.; Su, D.; Lee, J.; Vendrell, M.*; Chang, Y. T.* Bioorg. Med. Chem. Lett. 2015, 25, 4862-4865.
2. **A fluorescent chemical probe CDy9 selectively stains and enables the isolation of live naïve mouse embryonic stem cells**, Cho, S. J.; Kim, K. T.; Kim, J. S.; Kwon, O. S.; Go, Y. H.; Kang, N. Y.; Heo, H.; Kim, M. R.; Han, D. W.; Moon, S. H.; Chang, Y. T.*; Cha, H. J.* Biomaterials 2018, 180, 12-23.

CDy5

Cat. No. P005

Chemical structure



Order: www.senprobe.com/CDy5

Known Property:	Neural stem cells dye
Molecular Weight:	633.07 ($C_{31}H_{32}ClF_3N_4O_5$)
λex / λem:	563 / 578 nm
Application:	Immunofluorescence
Cell selectivity mechanism:	POLD (acid ceramidase)
Related probes:	CDy1, CDr3

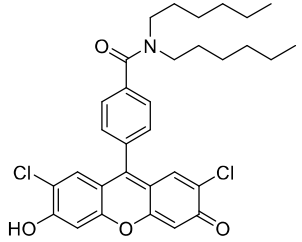
CDy5 selectively stains neural stem cells in neurosphere. In symmetric division, two identical daughter cells were visualized by **CDy5**. In asymmetric division, only small stem cell is fluorescently labeled and the other bigger differentiated cell was not stained by **CDy5**. The binding target of **CDy5** is acid ceramidase

Reference:

1. **A fluorescent probe for imaging symmetric and asymmetric cell division in neurosphere formation**, Yun, S. W.; Leong, C.; Bi, X.; Ha, H. H.; Yu, Y. H.; Tan, Y. L.; Narayanan, G.; Sankaran, S.; Kim, J. Y.; Hariharan, S.; Ahmed, S.; *Chang, Y. T.* Chem. Commun. 2014, 50, 7492-7494.

CDg13
Cat. No. P013

Chemical structure



Order: www.senprobe.com/CDg13

- **Known Property:** Mouse neural stem cell (NSC) probe
- **Molecular Weight:** 568.54 ($C_{32}H_{35}Cl_2NO_4$)
- **λex / λem:** 520 / 553 nm
- **Application:** Immunofluorescence
- **Cell selectivity mechanism:** GOLD (ABCG2)
- **Related probes:** CDy5, CDr3

CDg13 (Compound of Designation green 13) is a selective mouse neural stem cell (NSC) probe over mouse embryonic stem cell (mES), mouse embryonic fibroblast (MEF), and astrocyte. The mechanism of CDg13 for NSC selectivity was elucidated as gating-oriented live-cell distinction (GOLD) through ABCG2.

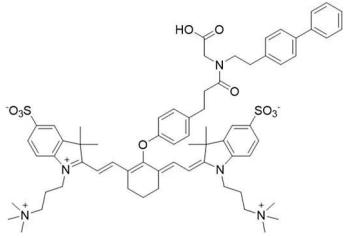
Reference:

1. **A Fluorescent Probe for Neural Stem/Progenitor Cells with High Differentiation Capability into Neurons**, Kim, B.; Feng, S.; Yun, S. W.; Leong, C.; Satapathy, R.; Wan, S. Y.; Chang, Y. T.* ChemBioChem 2016, 17, 2118-2122.

ElaNIR

Cat. No. P034

Chemical structure



Order: www.senprobe.com/ElaNIR

- **Known Property:** Elastin NIR probe
- **Molecular Weight:** 1181.52 ($C_{62}H_{68}N_6O_{11}S_2$)
- **λex / λem:** 787 / 805 nm
- **Application:** Immunofluorescence, Ex vivo mouse imaging, In vivo imaging
- **Cell selectivity mechanism:** POLD (Elastin)

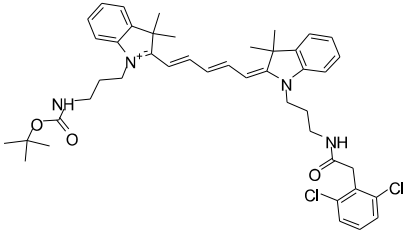
ElaNIR showed selective binding for elastin, such as those in the aorta, lungs, and skin. ElaNIR also allowed visualization and quantification of elastin levels in young and old mice, which reflect age-dependent changes of elastin in vivo. This makes ElaNIR a unique chemical tool for monitoring changes of elastin in tissue or animal models and provides new opportunities to study the effects of chemical compounds on elastin levels in biological processes.

Reference:

1. **Seeing Elastin: A Near-Infrared Zwitterionic Fluorescent Probe for In Vivo Elastin Imaging**: Su, D.; Teoh, C. L.; Park, S. J.; Kim, J. J.; Samanta, A.; Bi, R.; Danish, U. S.; Olivo, M.; Piantino, M.; Louis, F.; Matsusaki, M.; Kim, S. S.; Bae, M. A.; Chang, Y. T.* Chem 2018, 4, 1128-1138.

CyB C9
Cat. No. P050

Chemical structure



Order: www.senprobe.com/CyB_C9

Known Property:	Senescent Mesenchymal Stromal Cell selective probe
Molecular Weight:	756.82 ($C_{44}H_{53}Cl_2N_4O_3$)
λex / λem:	640 / 670 nm
Application:	Immunofluorescence
Cell selectivity mechanism:	Unknown

CyB C9 has a rapid process time (2 h), is nontoxic, and more sensitive in detecting senescent MSCs both in early and in late stages.

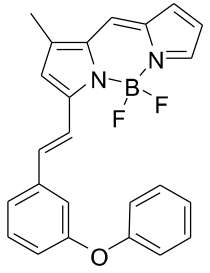
Reference:

1. **Rapid detection of senescent mesenchymal stromal cells by a fluorescent probe**, Ang, J.; Lee, Y. A.; Raghothaman, D.; Jayaraman, P.; Teo, K. L.; Khan, F. J.; Reuveny, S.; Chang, Y. T.; Kang, N. Y.; *Oh, S.* Biotechnol. J. 2019, 1800691.

AGO

Cat. No. P056

Chemical structure



Order: www.senprobe.com/AGO

- **Known Property:** AGE-selective probe
- **Molecular Weight:** 400.24 ($C_{24}H_{19}BF_2N_2O$)
- **λex / λem:** 490 / 570 nm
- **Application:** Fluorescence image
- **Cell selectivity mechanism:** Unknown
- **Related probes:** AGN

AGO (Advanced Glycation end-products Orange) is an AGE-selective probe with higher selectivity and sensitivity than conventional methods, allowing effective visualization of AGEs accumulation in a collagen ECM model. It has a BODIPY-based structure with a meta-phenoxybenzyl substituent and exhibits fluorescence at Excitation 490 nm / Emission 570 nm. **AGO** is designed for in vitro use, specifically for detecting AGEs in extracellular matrix (ECM) models. The meta-phenoxybenzyl moiety facilitates non-covalent interactions with Schiff bases and Amadori products, ensuring AGEs-specific binding. AGO has been validated through in vitro glycation models, including BSA-Ribose and collagen ECM systems, demonstrating its strong selectivity for AGEs.

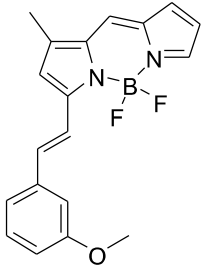
Reference:

1. **Development of a specific fluorescent probe to detect advanced glycation end products (AGEs)**, Cho, H.; Hong, N.-K.; Yong, I.; Kwon, H.-Y.; Kang, N.-Y.; Ciaramicoli, L. M.; Kim, P.; Chang, Y.-T.* J. Mater. Chem. B 2024, 12, 6155–6163.

AGN

Cat. No. P057

Chemical structure



Order: www.senprobe.com/AGN

- **Known Property:** AGE-selective negative probe
- **Molecular Weight:** 388.16 ($C_{19}H_{17}BF_2N_2O$)
- **λex / λem:** 490 / 570 nm
- **Application:** Fluorescence image
- **Cell selectivity mechanism:** Unknown
- **Related probes:** AGO

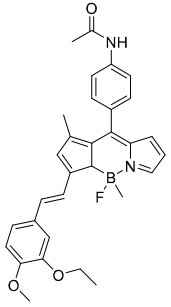
AGN (Advanced Glycation end-products Negative) is a negative control probe designed to validate the selectivity of AGO, engineered to prevent AGEs binding and produce minimal fluorescence. AGN features a meta-methoxybenzyl substituent, which prevents interactions with Schiff bases and Amadori products, making it an ideal negative control. It shares the same fluorescence properties as AGO (Excitation 490 nm / Emission 570 nm) but does not emit significant fluorescence in the presence of AGEs. By comparing AGO and AGN staining, AGN helps distinguish true AGEs-specific fluorescence from nonspecific background signals, ensuring reliable AGEs detection.

Reference:

1. **Development of a specific fluorescent probe to detect advanced glycation end products (AGEs)**, Cho, H.; Hong, N.-K.; Yong, I.; Kwon, H.-Y.; Kang, N.-Y.; Ciaramicoli, L. M.; Kim, P.; Chang, Y.-T.* J. Mater. Chem. B 2024, 12, 6155–6163.

CDr10a
Cat. No. P010a

■ **Chemical structure**



Order: www.senprobe.com/CDr10a

■ **Known Property:** Primary microglia and mouse cell line, BV2 cell selective probe

■ **Molecular Weight:** 515.37 ($C_{29}H_{28}BF_2N_3O_3$)

■ **λex / λem:** 570 / 620 nm

■ **Application:** Immunofluorescence

■ **Cell selectivity mechanism:** Unknown

■ **Related probes:** CDr20

CDr10 (Compound of Designation red 10) is microglia selective probe, and stains both primary microglia and mouse cell line BV2 cells. **CDr10a** is with acetyl group and CDr10b is with chloroacetyl group, which can make covalent bond with thiol group. Therefore, CDr10b staining survives cell methanol fixing condition, while **CDr10a** signal is washed out. CDr10 stains cytosol of microglia cell, and the selectivity mechanism is not known. CDr10b stains activated microglia stronger than resting state microglia. The low toxicity of CDr10b allowed a movie of microglia attacking glioma cells

---

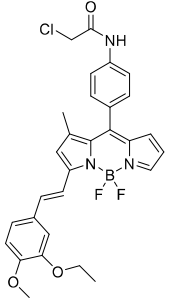
■ **Reference:**

1. **Microglia specific fluorescent probe for live cell imaging**, *Leong, C.; Lee, S. C.; Ock, J.; See, P.; Park, S. J.; Ginhoux, F.; Yun, S. W.; Chang, Y. T.* Chem. Commun. 2014, 50, 1089-1091.

CDr10b

Cat. No. P010b

Chemical structure



Order: www.senprobe.com/CDr10b

Known Property:	Primary microglia and mouse cell line, BV2 cell selective probe
Molecular Weight:	549.81 ($C_{29}H_{27}BClF_2N_3O_3$)
λex / λem:	571 / 611 nm
Application:	Immunofluorescence
Cell selectivity mechanism:	Unknown
Related probes:	CDr20

CDr10 (Compound of Designation red 10) is microglia selective probe, and stains both primary microglia and mouse cell line BV2 cells. CDr10a is with acetyl group and **CDr10b** is with chloroacetyl group, which can make covalent bond with thiol group. Therefore, **CDr10b** staining survives cell methanol fixing condition, while CDr10a signal is washed out. CDr10 stains cytosol of microglia cell, and the selectivity mechanism is not known. **CDr10b** stains activated microglia stronger than resting state microglia. The low toxicity of **CDr10b** allowed a movie of microglia attacking glioma cells

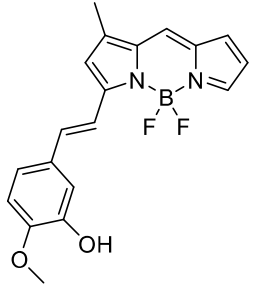
Reference:

1. **Microglia specific fluorescent probe for live cell imaging**, *Leong, C.; Lee, S. C.; Ock, J.; See, P.; Park, S. J.; Ginhoux, F.; Yun, S. W.; Chang, Y. T.* Chem. Commun. 2014, 50, 1089-1091.

CDr20

Cat. No. P020

Chemical structure



Order: www.senprobe.com/CDr20

Known Property:	Microglia selective probe
Molecular Weight:	354.16 ($C_{19}H_{17}BF_2N_2O_2$)
λex / λem:	568 / 600 nm
Application:	Immunofluorescence
Cell selectivity mechanism:	MOLD (Ugt1a7c)
Related probes:	CDr10

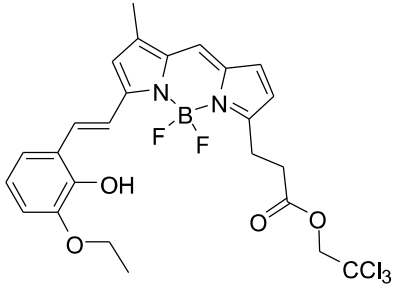
CDr20 works both in vitro cell culture and on brain slice. In mouse embryo, **CDr20** penetrated into brain tissue and live microglia was fluorescently stained. Through i.v. injection, **CDr20** was introduced to Alzheimer mouse brain and the microglia could be in situ imaged by two-photon fluorescence microscope.

Reference:

1. **Visualizing Microglia with a Fluorescence Turn-On Ugt1a7c Substrate**, *Kim, B.; Fukuda, M.; Lee, J. Y.; Su, D.; Sanu, S.; Silvin, A.; Khoo, A. T. T.; Kwon, T.; Liu, X.; Chi, W.; Liu, X.; Choi, S.; Wan, D. S. Y.; Park, S. J.; Kim, J. S.; Ginhoux, F.; Je, H. S.; Chang, Y. T.* Angew. Chem. Int. Ed. Engl. 2019, 58, 7972-7976.

BD-Oligo
Cat. No. P038

■ **Chemical structure**



Order: www.senprobe.com/BD-Oligo

■ **Known Property:** Aβ oligomer probe

■ **Molecular Weight:** 571.64 ($C_{25}H_{24}BCl_3F_2N_2O_4$)

■ **λex / λem:** 530 / 580 nm

■ **Application:** Immunofluorescence

■ **Cell selectivity mechanism:** Unknown

■ **Related probes:** CDnir7

BD-Oligo demonstrates a dynamic oligomer-monitoring ability during Aβ peptide fibrillogenesis, as Aβ was induced to form oligomers and eventually fibrils over time. More importantly, BD-Oligo also shows BBB penetration with capabilities of staining Aβ oligomers in vivo.

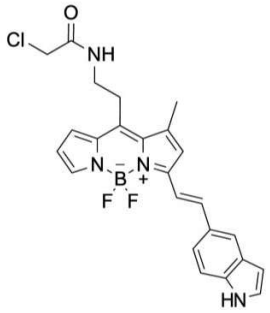
■ **Reference:**

1. **A chemical fluorescent probe for the detection of Aß oligomers**, Teoh, C. L.; Su, D. D.; Sahu, S.; Yun, S. W.; Drummond, E.; Prelli, F.; Lim, S.; Cho, S.; Ham, S.; Wisniewski, T.; Chang, Y. T. J. Am. Chem. Soc., 2015, available online.

BD-Tau

Cat. No. P039

■ **Chemical structure**



Order: www.senprobe.com/BD-Tau

■ **Known Property:** Tau probe

■ **Molecular Weight:** 466.72 ($C_{24}H_{22}BClF_2N_4O$)

■ **λex / λem:** 545 / 580 nm

■ **Application:** Immunofluorescence

■ **Cell selectivity mechanism:** Unknown

■ **Related probes:** BD-Oligo, 2C40, 2E10

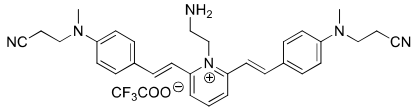
BD-tau, a BODIPY-based fluorescence sensor detects pathological tau aggregates in live cells. As a fluorescence turn-on sensor, the quantum yield of BD-tau increased 3.8-fold upon binding to tau aggregates in vitro. β-sheet protein panel assay indicates that BD-tau also responds to other β-sheet protein aggregates such as amyloid plaques and insulin aggregates. However, compared with other conventional tau probes, BD-tau has superior selectivity to tau aggregates over amyloid plaques or insulin aggregates. As a cell-permeable imaging probe, BD-tau selectively labeled pathological tau aggregates in live hippocampal neurons.

■ **Reference:**

1. **Development of a BODIPY-based fluorescent probe for imaging pathological tau aggregates in live cells**, Lim, S.; Haque, M. M.; Su, D.; Kim, D.; Lee, J. S.; Chang, Y. T.; Kim, Y. K. Chem. Commun. 2017, 53, 1607-1610.

2C40
Cat. No. P040

Chemical structure



Order: www.senprobe.com/2C40

- **Known Property:** Amyloid sensor
- **Molecular Weight:** 604.67 ($C_{33}H_{35}F_3N_6O_2$)
- **λex / λem:** 433 / 565 nm
- **Application:** Immunofluorescence
- **Cell selectivity mechanism:** Unknown
- **Related probes:** 2E10, BD-Oligo, BD-Tau

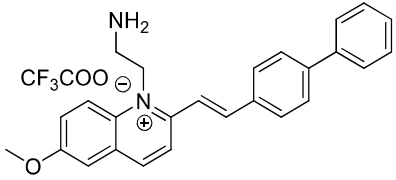
A library of fluorescent styryl dyes (320 compounds) was prepared by solid-phase chemistry. The dyes were screened for their detection of amyloid aggregates, which are associated with diseases such as Alzheimer's, and two of the 320 compounds screened, **2C40** and 2E10, showed promise as brain-imaging agents

Reference:

1. **Solid phase synthesis of styryl dye library and its application to amyloid sensors**, Li, Q.; Lee, J. S.; Ha, C.; Park, C. B.; Yang G.; Gan, W. B.; Chang, Y. T.* Angew. Chem., Int. Ed. Engl., 2004, 43, 6331-6335.

2E10
Cat. No. P041

Chemical structure



Order: www.senprobe.com/2E10

- **Known Property:** Amyloid sensor
- **Molecular Weight:** 494.5 ($C_{28}H_{25}F_3N_2O_3$)
- **λex / λem:** 441 / 491 nm
- **Application:** Immunofluorescence
- **Cell selectivity mechanism:** Unknown
- **Related probes:** 2C40, BD-Oligo, BD-Tau

A library of fluorescent styryl dyes (320 compounds) was prepared by solid-phase chemistry. The dyes were screened for their detection of amyloid aggregates, which are associated with diseases such as Alzheimer's, and two of the 320 compounds screened, 2C40 and **2E10**, showed promise as brain-imaging agents

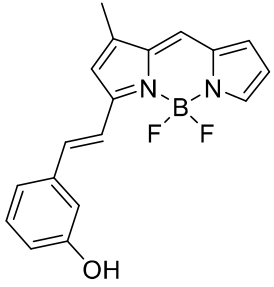
Reference:

1. **Solid phase synthesis of styryl dye library and its application to amyloid sensors**, Li, Q.; Lee, J. S.; Ha, C.; Park, C. B.; Yang G.; Gan, W. B.; Chang, Y. T.* Angew. Chem., Int. Ed. Engl., 2004, 43, 6331-6335.

Glucagon Yellow

Cat. No. P024

Chemical structure



Order: www.senprobe.com/GlucagonYellow

- **Known Property:** Pancreatic alpha cell
- **Molecular Weight:** 324.14 ($C_{18}H_{15}BF_2N_2O$)
- **λex / λem:** 550 / 568 nm
- **Application:** Immunofluorescence
- **Cell selectivity mechanism:** POLD (glucagon)
- **Related probes:** TP-alpha

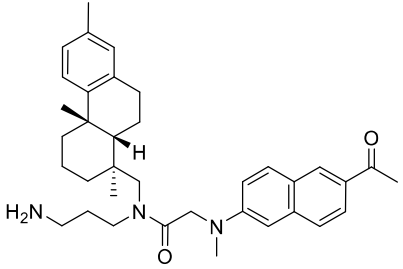
Glucagon yellow is a pancreatic alpha cell selective probe over beta cell. Glucagon yellow showed dose dependent fluorescence increase upon treatment of glucagon with slight red shift. In pancreatic tissue, Glucagon yellow showed a good correlation with glucagon antibody, but low correlation with insulin antibody

Reference:

1. **Synthesis of a bodipy library and its application to the development of live cell glucagon imaging probe**, Lee, J. S.; Kang, N. Y.; Kim, Y. K.; Samanta, A.; Feng, S.; Kim, H. K.; Vendrell, M.; Park, J. H.; Chang, Y. T.* J. Am. Chem. Soc. 2009, 131, 10077-10082.

TP-alpha
Cat. No. P026

■ **Chemical structure**



Order: www.senprobe.com/TP-alpha

■ **Known Property:** Pancreatic alpha cell

■ **Molecular Weight:** 553.79 ($C_{36}H_{47}N_3O_2$)

■ **λex / λem:** 370 / 510 nm

■ **Application:** Immunofluorescence, 3D imaging of live alpha cells using two photon microscopy

■ **Cell selectivity mechanism:** POLD (glucagon)

■ **Related probes:** Glucagon yellow (GY)

TP-alpha (Two Photon alpha cell probe) was discovered from "two photon green fluorescence library" by cell-based screening. **TP-alpha** is a pancreatic alpha cell selective probe over beta cell or acinar cell. TP-alpha showed dose dependent fluorescence increase upon treatment of glucagon, with low response to insulin or other proteins.

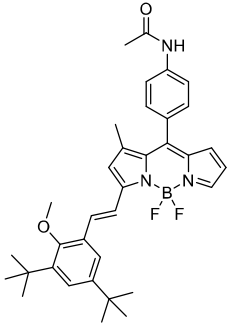
■ **Reference:**

1. **Glucagon-secreting alpha cell selective two-photon fluorescent probe TP-α: for live pancreatic islet imaging**, Agrawalla, B. K.; Chandran, Y.; Phue, W. H.; Lee, S. C.; Jeong, Y. M.; Wan, S. Y.; Kang, N. Y.; *Chang, Y. T.* J. Am. Chem. Soc. 2015, 137, 5355-5362.

PiY

Cat. No. P025

Chemical structure



Order: www.senprobe.com/PiY

Known Property:	Pancreatic beta cell
Molecular Weight:	583.53 ($C_{35}H_{40}BF_2N_3O_2$)
λex / λem:	558 / 585 nm
Application:	Immunofluorescence, Visualization of islets in pancreatic tissue by i.v. injection of mouse
Cell selectivity mechanism:	COLD (maybe glycogen)
Related probes:	TP-beta, PiF

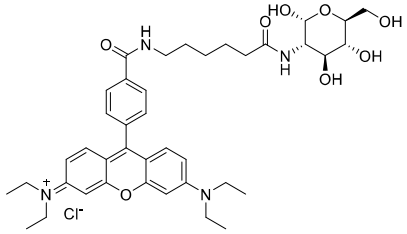
PiY (Pancreatic islet Yellow) is a pancreatic beta cell selective probe over alpha cell or acinar cell. Through i.v. injection of PiY into mouse tail vein, pancreatic islet was vividly visualized to facilitate the islet isolation.

Reference:

1. **Visualization and isolation of Langerhans islets by fluorescent probe PiY**, Kang, N. Y.; Lee, S. C.; Park, S. J.; Ha, H. H.; Yun, S. W.; Kostromina, E.; Gustavsson, N.; Ali, Y.; Chandran, Y.; Chun, H. S.; Bae, M. A.; Ahn, J. H.; Han, W.; Radda, G. K.; Chang, Y. T.* Angew. Chem., Int. Ed. Engl., 2013, 52, 8557-8560.

TP-beta
Cat. No. P027

Chemical structure



Order: www.senprobe.com/TP-beta

Known Property:	Pancreatic beta cell
Molecular Weight:	753.33 ($C_{40}H_{53}ClN_4O_8$)
λex / λem:	820 / 550-650 nm
Application:	Immunofluorescence
Cell selectivity mechanism:	GOLD (Glut2)
Related probes:	PiY, PiF

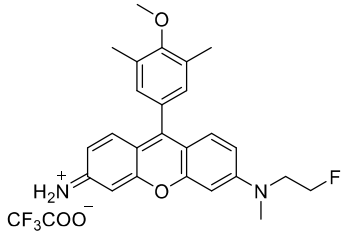
TP-beta (Two Photon beta cell probe) is a pancreatic beta cell selective probe over alpha cell. TP-beta is an optimized fluorescent 2-glucose derivative and the target is presumably Glut2, which is overexpressed in beta cell of pancreatic islet. TP-beta penetrates well into the core of the cultured dissociated pancreatic islets and stains most of the beta cells (74-75% of total cells in islet).

Reference:

1. **Two-photon dye cocktail for dual-color 3D imaging of pancreatic beta and alpha cells in live islets**, Agrawalla, B. K.; Lee, H. W.; Phue, W. H.; Raju, A.; Kim, J. J.; Kim, H. M.; Kang, N. Y.*; Chang, Y. T.* J. Am. Chem. Soc. 2017, 139, 3480-3487.

PiF
Cat. No. P031

■ **Chemical structure**



Order: www.senprobe.com/PiF

■ **Known Property:** Pancreatic beta cell
■ **Molecular Weight:** 518.51 ($C_{27}H_{26}F_4N_2O_4$)
■ **λex / λem:** 535 / 565 nm
■ **Application:** Immunofluorescence, PET imaging
■ **Cell selectivity mechanism:** POLD (insulin)
■ **Related probes:** PiY, TP-beta

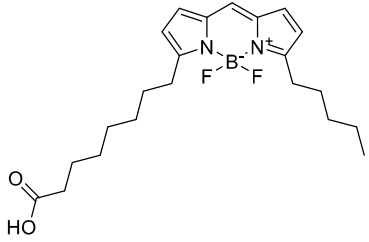
PiF (Pancreatic islet Fluorinated probe) is a superior pancreatic beta cell probe over PiY, facilitating the pancreatic tissue preparation from day to hours. PiF could detect not only healthy pancreatic beta cells, but also transplanted islet in the liver. PiF has built in F atom which could be replaced with 18F for PET imaging. PET imaging of pancreatic islet was demonstrated by replacing 19F with 18F of PiF

■ **Reference:**

1. **Multimodal imaging probe development for pancreatic β-cells: from fluorescence to PET**, Kang, N. Y.; Lee, J.; Lee, S. H.; Song, I. H.; Hwang, Y. H.; Kim, M. J.; Phue, W. H.; Agrawalla, B. K.; Wan, S. Y. D.; Lalic, J.; Park, S. J.; Kim, J. J.; Kwon, H. Y.; Im, S. H.; Bae, M. A.; Ahn, J. H.; Lim, C. S.; Teo, A. K. K.; Park, S.; Kim, S. E.; Lee, B. C.; Lee, D. Y.; *Chang, Y. T.* J. Am. Chem. Soc. 2020, 142, 3430-3439.

cLG
Cat. No. P058

Chemical structure



Order: www.senprobe.com/cLG

- **Known Property:** Liver cancer cell selective probe
- **Molecular Weight:** 404.31 ($C_{22}H_{31}BF_2N_2O_2$)
- **λex / λem:** 500 / 515 nm
- **Application:** Fluorescence image
- **Cell selectivity mechanism:** GOLD (SLC27A2)
- **Related probes:** hLR

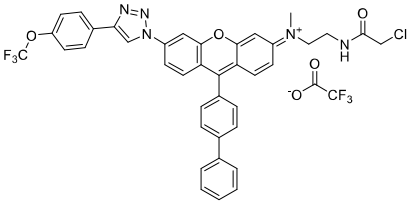
cLG was selective for liver cancer cells, whereas hLR was selective for healthy liver cells. These two probes selectively stained the targeted cells in the liver section, which was confirmed by H&E and antibody staining. In addition, the use of a cocktail of these two probes provided high contrast between the cancerous region and the normal region, enabling accurate cancer imaging.

Reference:

1. **A Pair of Fluorescent Probes Enabling Precise Diagnosis of Liver Cancer by Complementary Imaging**, Gao M, Lee SH, Kwon HY, Ciaramicoli LM, Jo E, Yu YH, Li F, Kim B, Hong K, Lee JS, Kim N, Oh Y, Im CY, Tan CSH, Ha HH, Chang YT., ACS Cent Sci., 2024 Dec 16;11(1):76-83.

hLR
Cat. No. P059

Chemical structure



Order: www.senprobe.com/hLR

- **Known Property:** Liver healthy cell selective probe
- **Molecular Weight:** 882.16 ($C_{41}H_{30}ClF_6N_5O_3$)
- **λex / λem:** 500 / 554 nm
- **Application:** Fluorescence image
- **Cell selectivity mechanism:** POLD (SMPD1)
- **Related probes:** cLG

cLG was selective for liver cancer cells, whereas **hLR** was selective for healthy liver cells. These two probes selectively stained the targeted cells in the liver section, which was confirmed by H&E and antibody staining. In addition, the use of a cocktail of these two probes provided high contrast between the cancerous region and the normal region, enabling accurate cancer imaging.

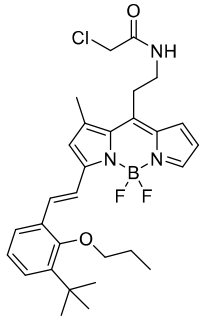
Reference:

1. **A Pair of Fluorescent Probes Enabling Precise Diagnosis of Liver Cancer by Complementary Imaging**, Gao M, Lee SH, Kwon HY, Ciaramicoli LM, Jo E, Yu YH, Li F, Kim B, Hong K, Lee JS, Kim N, Oh Y, Im CY, Tan CSH, Ha HH, Chang YT., ACS Cent Sci., 2024 Dec 16;11(1):76-83.

TiY

Cat. No. P028

■ **Chemical structure**



Order: www.senprobe.com/TiY

■ **Known Property:** Tumor Initiating Cell (TIC) probe

■ **Molecular Weight:** 541.87 ($C_{29}H_{35}BClF_2N_3O_2$)

■ **λex / λem:** 553 / 573 nm

■ **Application:** Immunofluorescence

Therapeutic treatment for TIC

■ **Cell selectivity mechanism:** POLD (heme oxygenase 2: HMOX2)

■ **Related probes:** TiNIR

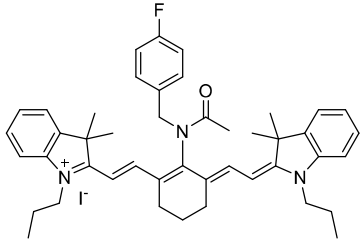
The chloroacetyl motif of **TiY** facilitated the binding target protein from TS32 cells, elucidating vimentin as TiY's target. Vimentin is an intermediate filament and EMT (Epithelial-mesenchymal transition) marker. **TiY** shows the inhibitor function against vimentin, and has higher affinity to tetramer comparing to monomer vimentin. At high dose, TiY suppresses the tumor sphere growth of TIC, without much effect to differentiated cancer cells or normal epithelial cells.

■ **Reference:**

1. **Identification of Tumor Initiating Cells by a Small Molecule Fluorescent Probe through Vimentin as the Biomarker**, *Lee, Y. A.; Kim, J. J.; Lee, J.; Lee, J. H. J.; Sahu, S.; Kwon, H. Y.; Park, S. J.; Jang, S. Y.; Lee, J. S.; Wang, Z.; Tam, W. L.; Lim, B.; Kang, N. Y.; Chang, Y. T.* Angew. Chem. Int. Ed. Engl. 2018, 57, 2851-2854.

TiNIR
Cat. No. P030

■ **Chemical structure**



Order: www.senprobe.com/TiNIR

■ **Known Property:** Tumor Initiating Cell (TIC) probe

■ **Molecular Weight:** 797.84 ($C_{45}H_{53}FIN_3O_2$)

■ **λex / λem:** 805 / 825 nm

■ **Application:** Immunofluorescence

Therapeutic treatment for TIC

■ **Cell selectivity mechanism:** POLD (heme oxygenase 2: HMOX2)

■ **Related probes:** TiY

The long wavelength of **TiNIR** allowed the in vivo imaging of tumor in mouse model both is fluorescence and photoacoustic imaging. The affinity of TiNIR to target proteins were monitored by fluorescence and the bound protein was identified as heme oxygenase 2 (HMOX2). TIC maintain high level of reactive oxygen species (ROS) in the cell, and HMOX2 seem to detoxify cells by removing intracellular ROS.

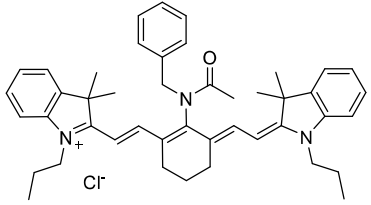
■ **Reference:**

1. **A NIR probe tracks and treats lung tumor initiating cells by targeting HMOX2**, *Kim, J. J.; Lee, Y. A.; Su, D.; Lee, J.; Park, S. J.; Kim, B.; Lee, J. H. J.; Liu, X.; Kim, S. S.; Bae, M. A.; Lee, J. S.; Hong, S. C.; Wang, L.; Samanta, A.; Kwon, H. Y.; Choi, S. Y.; Kim, J. Y.; Yu, Y. H.; Ha, H. H.; Wang, Z.; Tam, W. L.; Lim, B.; Kang, N. Y.; Chang, Y. T.* J. Am. Chem. Soc. 2019, 141, 14673-14686.

CDnir7

Cat. No. P007

Chemical structure



Order: www.senprobe.com/CDnir7

- **Known Property:** Macrophage probe
- **Molecular Weight:** 668.4 ($C_{45}H_{54}ClN_3O$)
- **λex / λem:** 806 / 821 nm
- **Application:** Immunofluorescence
- **Cell selectivity mechanism:** Unknown
- **Related probes:** CDg16

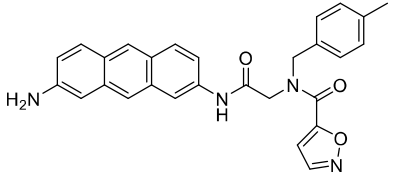
CDnir7 (Compound of Designation near infra red 7) is a macrophage selective probe with a long wavelength of near infrared (NIR) excitation and emission. With the deep tissue penetration optical property, **CDnir7** visualize the inflammation site in mouse paw (LPS injection model) using fluorescence molecular tomography. **CDnir7** is also active probe for photoacoustic imaging and breast tumor in mouse model could be visualized by multi-spectral optoacoustic tomography (MSOT). **CDnir7** was also successfully applied for Alzheimer disease mouse brain imaging through MSOT.

Reference:

1. **A macrophage uptaking near-infrared chemical probe CDnir7 for in vivo imaging of inflammation**, Kang, N. Y.; Park, S. J.; Ang, X. W.; Samanta, A.; Driessen, W. H.; Ntziachristos, V.; Vasquez, K. O.; Peterson, J. D.; Yun, S. W.; *Chang, Y. T.* Chem. Commun. 2014, 50, 6589-6591.
2. **Visualizing Alzheimer's Disease Mouse Brain with Multispectral Optoacoustic Tomography using a Fluorescent probe**, CDnir7, Park, S. J.; Ho, C. J. H.; Arai, S.; Samanta, A.; Olivo, M.; Chang, Y. T.* Sci. Rep. 2019, 9, 12052.

CDg16
Cat. No. P016

Chemical structure



Order: www.senprobe.com/CDg16

Known Property:	activated macrophage probe
Molecular Weight:	464.53 ($C_{28}H_{24}N_4O_3$)
λex / λem:	458 / 544 nm
Application:	Immunofluorescence
Cell selectivity mechanism:	GOLD (SLC18B1)
Related probes:	CDnir7

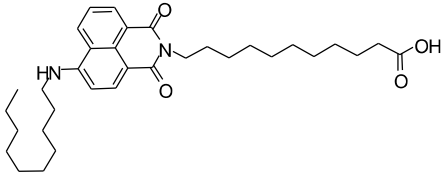
CDg16 (Compound of Designation green 16) is a selective probe for activated macrophage over resting state cells, and is expected to have high signal with low background at active inflammation site. CDg16 was originally discovered from mouse macrophage cell line (Raw264.7), but also showed good selectivity in mouse primary macrophages and human cell line. The staining of CDg16 is in vesicle in the cell and partially overlapped with lysosome.

Reference:

1. **Imaging inflammation using an activated macrophage probe with Slc18b1 as the activationselective gating target**, *Park, S. J.; Kim, B.; Choi, S.; Balasubramaniam, S.; Lee, S. C.; Lee, J. Y.; Kim, H. S.; Kim, J. Y.; Kim, J. J.; Lee, Y. A.; Kang, N. Y.; Kim, J. S.; Chang, Y. T.* Nat. Commun. 2019, 10, 1111.

CDg18
Cat. No. P018

Chemical structure



Order: www.senprobe.com/CDg18

- **Known Property:** M2 macrophage probe
- **Molecular Weight:** 536.76 ($C_{33}H_{48}N_2O_4$)
- **λex / λem:** 444 / 525 nm
- **Application:** Immunofluorescence
- **Cell selectivity mechanism:** GOLD

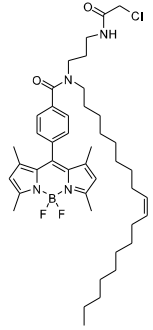
M2 selective probe **CDg18** with a novel mechanism of Gating-Oriented Live-cell Distinction through M2 favored fatty acid transporters. **CDg18** visualized the progressive phenotypic change of M2 towards M1 using a resveratrol analogue HS-1793 as a reprogramming effector. Combined together with M1 probe CDr17, the diminishing M2 character and emerging M1 markers could be simultaneously monitored in real time through the multi-color changes during the macrophage reprogramming.

Reference:

1. **Development of a Fluorescent Probe for M2 Macrophages via Gating-Oriented Live-Cell Distinction**, Cho, H.; Kwon, H. Y.; Lee, S. H.; Lee, H. G.; Kang, N. Y.*; Chang, Y. T.* J. Am. Chem. Soc. 2023, 145, 2951-2957.

CDgB
Cat. No. P032

■ Chemical structure



Order: www.senprobe.com/CDgB

■ **Known Property:** B lymphocyte probe

■ **Molecular Weight:** 688.4 ($C_{45}H_{54}ClN_3O$)

■ **λex / λem:** 502 / 518 nm

■ **Application:** Immunofluorescence

■ **Cell selectivity mechanism:** LOLD (lipid membrane fluidity)

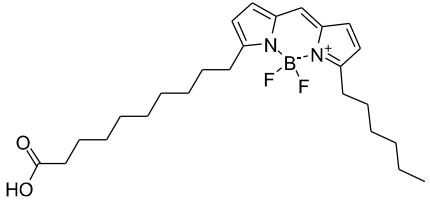
CDgB (Compound of Designation green for B cell) is a selective fluorescent probe for B cell over T cell. B and T lymphocytes are similar in size and shape and it is practically impossible to distinguish them without the aid of antibody. **CDgB** is the first small molecule probe which distinguish B cell from T cell. **CDgB** has long hydrocarbon chain and the cell selectivity originates from the cell membrane lipid composition. In comparing to B cell, T cell has longer hydrocarbon in the plasma membrane lipid and also higher contents of cholesterol.

■ Reference:

1. **Lipid-Oriented Live-Cell Distinction of B and T Lymphocytes**, Kwon, H. Y.; Kumar Das, R.; Jung, G. T.; Lee, H. G.; Lee, S. H.; Berry, S. N.; Tan, J. K. S.; Park, S.; Yang, J. S.; Park, S.; Baek, K.; Park, K. M.; Lee, J. W.; Choi, Y. K.; Kim, K. H.; Kim, S.; Kim, K. P.; Kang, N. Y.*; Kim, K.*; Chang, Y. T.* J. Am. Chem. Soc. 2021, 143, 5836-5844.

NeutropG
Cat. No. P055

Chemical structure



Order: www.senprobe.com/NeutropG

Known Property:	Neutrophil probe
Molecular Weight:	446.38 ($C_{25}H_{37}BF_2N_2O_2$)
λex / λem:	511 / 519 nm
Application:	Immunofluorescence
Cell selectivity mechanism:	MOLD

NeutropG is a selective fluorescent probe for identifying and imaging live neutrophils, showing high specificity among granulocytes. It targets lipid droplet biosynthesis enzymes (ACSL and DGAT) following the Metabolism-Oriented Live-cell Distinction (MOLD) concept. NeutropG is fast, stable, wash-free, and biocompatible, proving effective in clinical blood samples and demonstrating potential as a diagnostic tool for metabolically active neutrophils

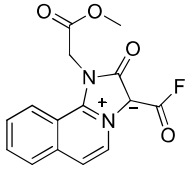
Reference:

1. **Neutrophil Selective Fluorescent Probe Development through Metabolism-Oriented Live-cell Distinction**, Gao, M.; Lee, S. H.; Park, S. H.; Ciaramicoli, L. M.; Kwon, H. Y.; Cho, H.; Jeong, J.; Chang, Y. T.* Angew. Chem. Int. Ed. Engl. 2021, 60, 23742-23749.

Histamine Blue

Cat. No. P060

Chemical structure



Order: www.senprobe.com/HistamineBlue

Known Property:	Basophil selective through histamine sensing
Molecular Weight:	302.26 ($C_{15}H_{11}FN_2O_4$)
λex / λem:	346 / 417 nm
Application:	Immunofluorescence
Cell selectivity mechanism:	Unknown

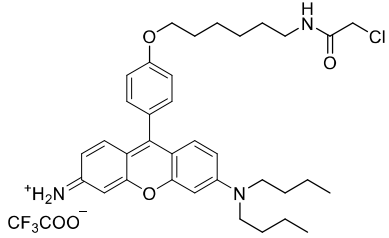
Histamine Blue is a mesoionic acid fluoride showing a 14-fold fluorescence increase upon condensation with histamine. **Histamine Blue** displays very good selectivity over a broad range of signalling molecules and metabolites due to the catalytic effect of the imidazole group, and is the first fluorescent small molecule for imaging histamine in live RBL-2H3 basophils. **Histamine Blue** can also monitor the uptake and de novo synthesis of histamine in live RAW 264.7 macrophages and its fluorescence intensity correlates well with the histamine levels in cell extracts.

Reference:

1. **Imaging Histamine in Live Basophils and Macrophages with a Fluorescent Mesoionic Acid Fluoride**, Kielland, N.; Vendrell, M.; Lavilla, R.*; Chang, Y. T.* Chem. Commun. 2012, 48, 7401-7403
2. **Neutrophil Selective Fluorescent Probe Development through Metabolism-Oriented Live-cell Distinction**, Gao, M.; Lee, S. H.; Park, S. H.; Ciaramicoli, L. M.; Kwon, H. Y.; Cho, H.; Jeong, J.; Chang, Y. T.* Angew. Chem. Int. Ed. Engl. 2021, 60, 23742-23749.

CDy2
Cat. No. P002

■ Chemical structure



Order: www.senprobe.com/CDy2

■ **Known Property:**	Differentiated muscle cell probe
■ **Molecular Weight:**	704.23 ($C_{37}H_{45}ClF_3N_3O_5$)
■ **λex / λem:**	545 / 610 nm
■ **Application:**	Immunofluorescence
■ **Cell selectivity mechanism:**	POLD (ALDH2 in mitochondria)
■ **Related probes:**	E26, I25, I31

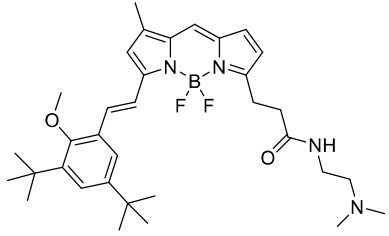
CDy2 stains mitochondria in live muscle cells and target protein was expected to covalently labeled through CA group of **CDy2**. The fluorescent property of **CDy2** allowed to monitor the binding protein from SDS-gel and the biomarker of **CDy2** was elucidated as ALDH2.

■ Reference:

1. **Binding of fluorophores to proteins depends on the cellular environment**, Kim, Y. K.; Lee, J. S.; Bi, X.; Ha, H. H.; Ng, S. H.; Ahn, Y. H.; Lee, J. J.; Wagner, B. K.; Clemons, P. A.; Chang, Y. T.* Angew. Chem., Int. Ed. Engl. 2011, 50, 2761-2763.
2. **Small-molecule fluorophores to detect cell-state switching in the context of highthroughput screening**, Wagner, B. K.; Carrinski, H. A.; Ahn, Y. H.; Kim, Y. K.; Gilbert, T. J.; Fomina, D. A.; Schreiber, S. L.; Chang, Y. T.; Clemons, P. A. J. Am. Chem. Soc. 2008, 130, 4208-4209.
3. **Site-selective labeling at Cys302 of aldehyde dehydrogenase unveils a selective mitochondrial stain**, Kim, Y. K.; Lee, J. K.; Lee, J. S.; Yoon, C. N.; Chang, Y. T.* Mol. Biosyst. 2011, 7, 2375-2378.

CDy6
Cat. No. P006

Chemical structure



Order: www.senprobe.com/CDy6

Known Property:	Mitotic cell probe
Molecular Weight:	592.58 ($C_{34}H_{47}BF_2N_4O_2$)
λex / λem:	570 / 585 nm
Application:	Immunofluorescence
Cell selectivity mechanism:	Unknown, lysosomal localization
Related probes:	CDb12

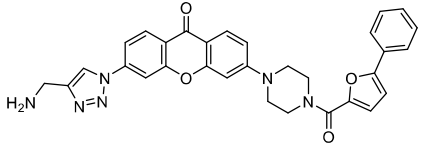
CDy6 (Compound of Designation yellow 6) was discovered from mitotic cell selective dye screening. **CDy6** stains lysosome and the fluorescence intensity increases during the mitosis in RPE1, Hela, and U2OS cells. **CDy6** is photostable and non-toxic, so the stable lysosome imaging was possible for at least 3 cell division cycle.

Reference:

1. **CDy6, a photostable probe for long-term real-time visualization of mitosis and proliferating cells**, Jeong, Y. M.; Duanting, Z.; Hennig, H.; Samanta, A.; Agrawalla, B. K.; Bray, M. A.; Carpenter, A. E.; Chang, Y. T.* Chem. Biol. 2015, 22, 299-307.

CDb12
Cat. No. P012

Chemical structure



Order: www.senprobe.com/CDb12

Known Property:	Mitotic cell probe
Molecular Weight:	546.59 ($C_{31}H_{26}N_6O_4$)
λex / λem:	365 / 500 nm
Application:	Immunofluorescence
Cell selectivity mechanism:	Unknown, nuclear localization
Related probes:	CDy6

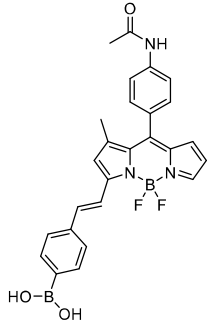
CDb12 (Compound of Designation blue 12) was discovered from mitotic cell selective dye screening in RPE1 cells, and stains mitotic cells 7 times stronger than interphase cells. CDb12 stains nucleus and increase the fluorescence upon treatment of DNA, but not of RNA. **CDb12** could monitor the dynamic cell division at least for 2 cell division cycle. In contrast, Hoechst treated cells showed cell cycle arrest at M phase, may be due to too strong binding to DNA.

Reference:

1. **Development of nucleus staining fluorescent probe for dynamic mitosis imaging in live cells**, Ghosh, K. K.; Jeong, Y. M.; Kang, N. Y.; Lee, J. Y.; Wan, S. Y.; Kim, J. Y.; Yoo, J.; Kim, D.; Kim, Y. K.; *Chang, Y. T.* Chem. Commun. 2015, 51, 9336-9338.

BacGO
Cat. No. P029

Chemical structure



Order: www.senprobe.com/BacGO

Known Property:	Gram positive bacteria probe
Molecular Weight:	485.1 ($C_{26}H_{23}B_2F_2N_3O_3$)
λex / λem:	563 / 578 nm
Application:	Immunofluorescence
Cell selectivity mechanism:	COLD (peptidoglycan of bacteria)
Related probes:	CDy11, CDy14, CDr15

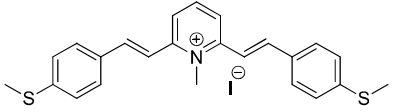
BacGO (Bacteria Gram-positive Orange) is selective fluorescent probe for gram positive bacteria over gram negative bacteria. Boronic acid is a popular binding motif for vicinal diol and has been used for carbohydrate recognition. Gram positive bacteria contains higher contents of peptidoglycan than Gram negative bacteria and boronic acid is expected to more selectively bind to Gram positive bacteria. A series of boronic acid containing fluorescent compounds were tested for Gram positive bacteria selective staining, and **BacGO** was discovered as a universal Gram positive bacteria probe.

Reference:

1. **Development of a Universal Fluorescent Probe for Gram-Positive Bacteria**, Kwon, H. Y.; Liu, X.; Choi, E. G.; Lee, J. Y.; Choi, S. Y.; Kim, J. Y.; Wang, L.; Park, S. J.; Kim, B.; Lee, Y. A.; Kim, J. J.; Kang, N. Y.; *Chang, Y. T.* Angew. Chem. Int. Ed. Engl. 2019, 58, 8426-8431.

DNA-green
Cat. No. P033

Chemical structure



Order: www.senprobe.com/DNA-green

- **Known Property:** DNA selective probe
- **Molecular Weight:** 517.5 ($C_{24}H_{24}INS_2$)
- **λex / λem:** 420 / 540 nm
- **Application:** Immunofluorescence
- **Cell selectivity mechanism:** DOLD

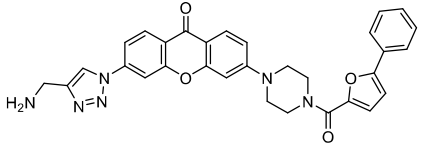
DNA-selective probe, **DNA green**, capable of cell imaging, and also DNA quantification in flow cytometry. It is noteworthy that **DNA green** works both in live and fixed cells, which allows various experimental options in cellular imaging. As a practical green DNA staining dye, **DNA green** provides broader color options for biological imaging by a simple chemical method.

Reference:

1. **Discovery of a Green DNA Probe for Live-Cell Imaging**, Feng, S.; Kim, Y. K.; Yang, Q.; Chang, Y. T.* Chem. Commun., 2010, 46, 436-438.

CDb12
Cat. No. P012

Chemical structure



Order: www.senprobe.com/CDb12

Known Property:	Mitotic cell probe
Molecular Weight:	546.59 ($C_{31}H_{26}N_6O_4$)
λex / λem:	365 / 500 nm
Application:	Immunofluorescence
Cell selectivity mechanism:	Unknown, nuclear localization
Related probes:	CDy6

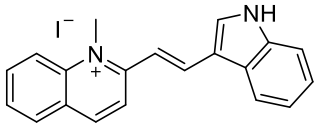
CDb12 (Compound of Designation blue 12) was discovered from mitotic cell selective dye screening in RPE1 cells, and stains mitotic cells 7 times stronger than interphase cells. CDb12 stains nucleus and increase the fluorescence upon treatment of DNA, but not of RNA. **CDb12** could monitor the dynamic cell division at least for 2 cell division cycle. In contrast, Hoechst treated cells showed cell cycle arrest at M phase, may be due to too strong binding to DNA.

Reference:

1. **Development of nucleus staining fluorescent probe for dynamic mitosis imaging in live cells**, Ghosh, K. K.; Jeong, Y. M.; Kang, N. Y.; Lee, J. Y.; Wan, S. Y.; Kim, J. Y.; Yoo, J.; Kim, D.; Kim, Y. K.; *Chang, Y. T.* Chem. Commun. 2015, 51, 9336-9338.

E36
Cat. No. P021

■ **Chemical structure**



Order: www.senprobe.com/E36

■ **Known Property:** RNA probe

■ **Molecular Weight:** 285.37 ($C_{20}H_{17}IN_2$)

■ **λex / λem:** 457 / 541 nm

■ **Application:** Selective fluorescent imaging of nuclear structure in live cells

■ **Cell selectivity mechanism:** RNA

■ **Related probes:** E144, F22

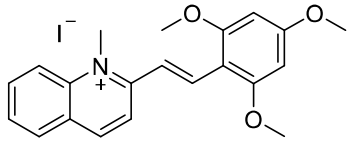
E36 is a selective RNA probe over DNA. **E36** was disclosed through in vitro DNA/RNA selectivity screening and live cell staining for nucleolus

■ **Reference:**

1. **RNA-selective, live cell imaging probes for studying nuclear structure and function.**, Li, Q., Kim, Y. K., Namm, J., Kulkarni, A., Rosania, G., Ahn, Y. H., Chang, Y. T.* Chem. Biol. 2006, 13, 615-623.
2. **A protocol for preparing, characterizing and using three RNA-specific, live cell imaging probes: E36**, E144 and F22 Li, Q.; Chang, Y. T.* Nat. Protoc. 2006, 1, 2922-2932.
3. **Nuclear envelope budding enables large ribonucleoprotein particle export during synaptic wnt signaling**, Speese, S. D.; Ashley, J.; Jokhi, V.; Nunnari, J.; Barria, R.; Li, Y.; Ataman, B.; Koon, A.; Chang, Y. T.; Li, Q.; Moore, M. J.; Budnik, V. Cell 2012, 149, 832-846.

E144
Cat. No. P022

■ Chemical structure



Order: www.senprobe.com/E144

■ **Known Property:**	RNA probe
■ **Molecular Weight:**	464.32 ($C_{21}H_{22}IN_3$)
■ **λex / λem:**	440 / 532 nm
■ **Application:**	Selective fluorescent imaging of nuclear structure in live cells
■ **Cell selectivity mechanism:**	RNA
■ **Related probes:**	E36, F22

E144 is a selective RNA probe over DNA. E144 was disclosed through in vitro DNA/RNA selectivity screening and live cell staining for nucleolus

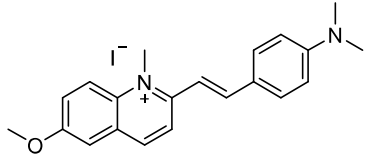
■ Reference:

1. **RNA-selective, live cell imaging probes for studying nuclear structure and function.**, Li, Q., Kim, Y. K., Namm, J., Kulkarni, A., Rosania, G., Ahn, Y. H., Chang, Y. T.* Chem. Biol. 2006, 13, 615-623.
2. **A protocol for preparing, characterizing and using three RNA-specific, live cell imaging probes: E36**, E144 and F22 Li, Q.; Chang, Y. T.* Nat. Protoc. 2006, 1, 2922-2932.

F22

Cat. No. P023

Chemical structure



Order: www.senprobe.com/F22

Known Property:	RNA probe
Molecular Weight:	446.33 ($C_{21}H_{23}IN_2O$)
λex / λem:	492 / 598 nm (with buffer)
	548 / 620 nm (with RNA)
Application:	Selective fluorescent imaging of nuclear structure in live cells
Cell selectivity mechanism:	RNA
Related probes:	E36, E144

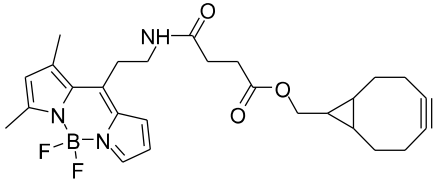
F22 is a selective RNA probe over DNA. **F22** was disclosed through in vitro DNA/RNA selectivity screening and live cell staining for nucleolus

Reference:

1. **RNA-selective, live cell imaging probes for studying nuclear structure and function**., Li, Q., Kim, Y. K., Namm, J., Kulkarni, A., Rosania, G., Ahn, Y. H., Chang, Y. T.* Chem. Biol. 2006, 13, 615-623.
2. **A protocol for preparing, characterizing and using three RNA-specific, live cell imaging probes: E36**, E144 and F22 Li, Q.; Chang, Y. T.* Nat. Protoc. 2006, 1, 2922-2932.
3. **RNA buffers the phase separation behavior of prion-like RNA binding proteins**, Maharana, S.; Wang, J.; Papadopoulos, D. K.; Richter, D.; Pozniakovsky, A.; Poser, I.; Bickle, M.; Rizk, S.; Guillén-Boixet, J.; Franzmann, T.; Jahnel, M.; Marrone, L.; Chang, Y. T.; Sterneckert, J.; Tomancak, P.; Hyman, A. A.; Alberti, S. Science 2018, 360, 918-921.
4. **RNA-Induced Conformational Switching and Clustering of G3BP Drive Stress Granule Assembly by Condensation**, Guillén-Boixet, J.; Kopach, A.; Holehouse, A. S.; Wittmann, S.; Jahnel, M.; Schlüßler, R.; Kim, K.; Trussina, I. R. E. A.; Wang, J.; Mateju, D.; Poser, I.; Maharana, S.; Ruer-Gruß, M.; Richter, D.; Zhang, X.; Chang, Y. T.; Guck, J.; Honigmann, A.; Mahamid, J.; Hyman, A. A.; Pappu, R. V.; Alberti, S.; Franzmann, T. M. Cell 2020, 181, 346-361.

CO-1
Cat. No. P049

Chemical structure



Order: www.senprobe.com/CO-1

Known Property:	Bio-orthogonal Click reaction
Molecular Weight:	495.37 ($C_{27}H_{32}BF_2N_3O_3$)
λex / λem:	490 / 510 nm
Application:	Immunofluorescence
Cell selectivity mechanism:	Unknown
Related probes:	AzG-1

CO-1 is cell permeable background-free probe through optimized lipophilicity, water solubility and charged van der Waals surface area. **CO-1**, a cyclooctyne-containing BODIPY probe, is also specifically label intracellular azide-tagged organelles & engineered proteins with minimum background.

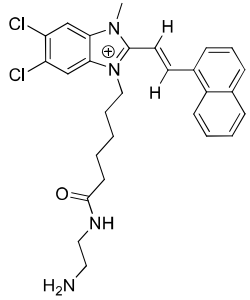
Reference:

1. **Development of background-free tame fluorescent probes for intracellular live cell imaging**, Alamudi, S. H.; Satapathy, R.; Kim, J.; Su, D.; Ren, H.; Das, R.; Hu, L.; Alvarado-Martínez, E.; Lee, J. Y.; Hoppmann, C.; Peña-Cabrera, E.; Ha, H. H.; Park, H. S.; *Wang, L.*; Chang, Y. T.* Nat. Commun. 2016, 7, 11964.

JC-D7

Cat. No. P035

Chemical structure



Order: www.senprobe.com/JC-D7

- **Known Property:** Poly phosphate probe
- **Molecular Weight:** 509.20 ($C_{28}H_{31}Cl_2N_4O^+$)
- **λex / λem:** 405 / 530 nm
- **Application:** Live imaging, Immunofluorescence
- **Cell selectivity mechanism:** Unknown
- **Related probes:** JC-D8

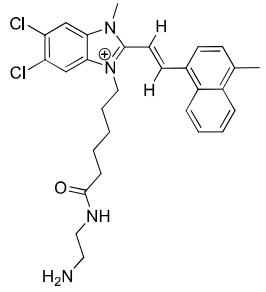
JC-D7/ JC-D8 demonstrate high selectivity for the labeling of polyP that was not sensitive to a number of ubiquitous organic polyphosphates, notably RNA. Use of these probes allowed us to demonstrate the real-time detection of polyP release from lysosomes in live cells.

Reference:

1. **In Situ Investigation of Mammalian Inorganic Polyphosphate Localization Using Novel Selective Fluorescent Probes JC-D7 and JC-D8**, Angelova, P. R.; Agrawalla, B. K.; Elustondo, P. A.; Gordon, J.; Shiba, T.; Abramov, A. Y.; Chang, Y. T.; *Pavlov, E. V.* ACS Chem Biol. 2014, 9, 2101-2110.

JC-D8
Cat. No. P036

Chemical structure



Order: www.senprobe.com/JC-D8

Known Property:	Poly phosphate probe
Molecular Weight:	523.2 ($C_{29}H_{33}Cl_2N_4O^+$)
λex / λem:	390 / 535 nm
Application:	Live imaging, Immunofluorescence
Cell selectivity mechanism:	Unknown
Related probes:	JC-D7

JC-D7/ **JC-D8** demonstrate high selectivity for the labeling of polyP that was not sensitive to a number of ubiquitous organic polyphosphates, notably RNA. Use of these probes allowed us to demonstrate the real time detection of polyP release from lysosomes in live cells.

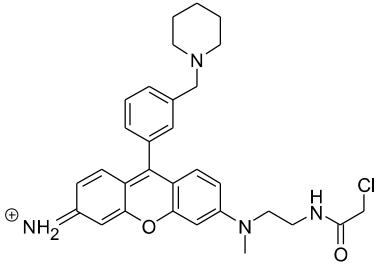
Reference:

1. **In Situ Investigation of Mammalian Inorganic Polyphosphate Localization Using Novel Selective Fluorescent Probes JC-D7 and JC-D8**, Angelova, P. R.; Agrawalla, B. K.; Elustondo, P. A.; Gordon, J.; Shiba, T.; Abramov, A. Y.; Chang, Y. T.; *Pavlov, E. V.* ACS Chem Biol. 2014, 9, 2101-2110.

MTX

Cat. No. P043

Chemical structure



Order: www.senprobe.com/MTX

- **Known Property:** Temperature Probe
- **Molecular Weight:** 575.72 ($C_{30}H_{34}ClN_4O_2^+$)
- **λex / λem:** 536 / 563 nm
- **Application:** Cell organelle imaging
- **Cell selectivity mechanism:** Unknown
- **Related probes:** ER ThermAC

MTX, a modified version of MTY have been developed for assessing the temperature of mitochondria in living cells.
Their use as nanothermometers is dependent on their long term retention in mitochondria, lack of interference with mitochondrial activities, and on their propensity to be unaffected by fluctuations of membrane potential, which is likely enabled by their binding to specific targets within mitochondria.

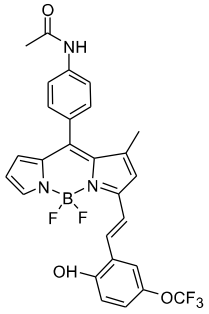
Reference:

1. **Pitfalls in Monitoring Mitochondrial Temperature Using Charged Thermosensitive Fluorophores**, Chrétien, D.; Bénit, P.; Leroy, C.; El-Khoury, R.; Park, S.; Lee, J. Y.; Chang, Y. T.; Lenaers, G.; Rustin, R.; Rak, M. Chemosensors 2020, 8, 124.

ER ThermAC

Cat. No. P037

Chemical structure



Order: www.senprobe.com/ERThermAC

Known Property:	Temperature Probe
Molecular Weight:	541.28 ($C_{22}H_{21}BF_5N_3O_3$)
λex / λem:	510 / 590 nm
Application:	Cell organelle imaging
Cell selectivity mechanism:	Unknown
Related probes:	ER Thermo Yellow, JC-1

A novel BODIPY-based thermosensitive dye, **ER thermAC**, is quickly and easily taken up into the endoplasmic reticulum of adipocytes where it forms a contiguous intraorganellar thermometer for the optical visualisation of thermogenesis. Following adrenergic stimuli, heat production occurred at random timings in each cell, and the dynamics of thermogenesis was consistent with mitochondrial depolarisation observed using JC-1.

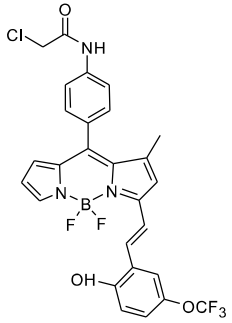
Reference:

1. **Optical visualisation of thermogenesis in stimulated single cell brown adipocytes**, Kriszt, R.; Arai, S.; Itoh, H.; Lee, M. H.; Goralczyk, A. G.; Ang, X. M.; Cypess, A. M.; White, A. P.; Shamsi, F.; Xue, R.; Lee, J. Y.; Lee, S. C.; Hou, Y.; Kitaguchi, T.; Sudhaharan, T.; Ishiwata, S.; Lane, E. B.; Chang, Y. T. Tseng, Y. H.; Suzuki, M.; Raghunath, M. Sci. Rep. 2017, 7, 1383.

ER Thermo Yellow

Cat. No. P038

Chemical structure



Order: www.senprobe.com/ERThermoYellow

Known Property:	Temperature Probe
Molecular Weight:	575.72 ($C_{27}H_{20}BClF_5N_3O_3$)
λex / λem:	560 / 585 nm
Application:	Cell organelle imaging
Cell selectivity mechanism:	Unknown
Related probes:	ER ThermAC

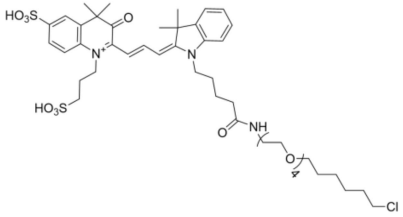
ER thermo yellow stains the target organelle evenly without the commonly encountered problem of aggregation, and successfully demonstrates the ability to monitor intracellular temperature gradients generated by external heat sources in various cell types

Reference:

1. **A molecular fluorescent probe for targeted visualization of temperature at the endoplasmic reticulum**, Arai, S.; Lee, S. C.; Zhai, D.; Suzuki, M.; Chang, Y. T.* Sci. Rep. 2014, 4, 6701.

PF555-CA1
Cat. No. PF001

Chemical structure



Order: www.senprobe.com/PFCA1

Known Property:	Super-photostable dye
Molecular Weight:	952.61 ($C_{46}H_{66}ClN_3O_{12}S_2$)
λex / λem:	555 / 567 nm
Application:	Imaging using Chloroalkyl labeling
Cell selectivity mechanism:	Not applicable

PF555 (Phoenix Fluor 555) is a cyanine-based orange-red fluorescent dye with a novel backbone structure known as 3-oxo-cyanine. It exhibits exceptional photostability and low oxygen sensitivity during fluorescence imaging. Thanks to its unique properties, **PF555** enables long-term live-cell imaging without the need for scavengers. Observing the internalization and recycling of EGFR (Epidermal Growth Factor Receptor) is often challenging with commercial dyes due to their limited photostability and short observation windows. However, the superior photostability of **PF555** allows for successful visualization of these processes.

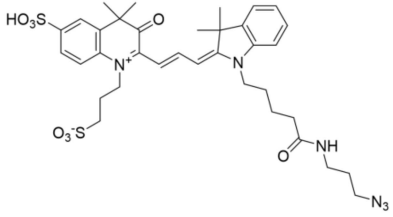
Reference:

1. **Super-Photostable Organic Dye for Long-Term Live-cell Single Protein Imaging**, Kim, D. H.*; Triet, H. M.; Lee, S. H.; Jazani, S.; Jang, S.; Abedi, S. A. A.; Xiagang, L.; Seo, J.; Ha, T.; Chang, Y. T.*, Ryu, S. H.* Nat. Methods, 2025, 22(3), 550-558.

PF555-Az1

Cat. No. PF002

Chemical structure



Order: www.senprobe.com/PFAz1

Known Property:	Super-photostable dye
Molecular Weight:	740.89 ($C_{35}H_{44}N_6O_8S_2$)
λex / λem:	555 / 567 nm
Application:	Labeling using click reaction
Cell selectivity mechanism:	Not applicable
Related probes:	PF555-Az2

PF555 (Phoenix Fluor 555) is a cyanine-based orange-red fluorescent dye with a novel backbone structure known as 3-oxo-cyanine. It exhibits exceptional photostability and low oxygen sensitivity during fluorescence imaging. Thanks to its unique properties, **PF555** enables long-term live-cell imaging without the need for scavengers. Observing the internalization and recycling of EGFR (Epidermal Growth Factor Receptor) is often challenging with commercial dyes due to their limited photostability and short observation windows. However, the superior photostability of **PF555** allows for successful visualization of these processes.

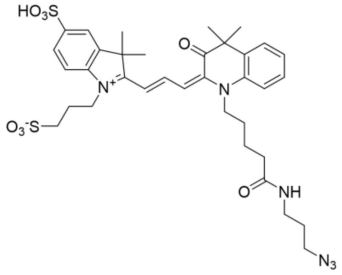
Reference:

1. **Super-Photostable Organic Dye for Long-Term Live-cell Single Protein Imaging**, Kim, D. H.*; Triet, H. M.; Lee, S. H.; Jazani, S.; Jang, S.; Abedi, S. A. A.; Xiagang, L.; Seo, J.; Ha, T.; Chang, Y. T.*, Ryu, S. H.* Nat. Methods, 2025, 22(3), 550-558.

PF555-Az2

Cat. No. PF003

Chemical structure



Order: www.senprobe.com/PFAz2

Known Property:	Super-photostable dye
Molecular Weight:	740.89 ($C_{35}H_{44}N_6O_8S_2$)
λex / λem:	555 / 567 nm
Application:	Labeling using click reaction
Cell selectivity mechanism:	Not applicable
Related probes:	PF555-Az1

PF555 (Phoenix Fluor 555) is a cyanine-based orange-red fluorescent dye with a novel backbone structure known as 3-oxo-cyanine. It exhibits exceptional photostability and low oxygen sensitivity during fluorescence imaging. Thanks to its unique properties, **PF555** enables long-term live-cell imaging without the need for scavengers. Observing the internalization and recycling of EGFR (Epidermal Growth Factor Receptor) is often challenging with commercial dyes due to their limited photostability and short observation windows. However, the superior photostability of **PF555** allows for successful visualization of these processes.

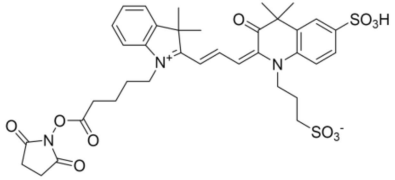
Reference:

1. **Super-Photostable Organic Dye for Long-Term Live-cell Single Protein Imaging**, Kim, D. H.*; Triet, H. M.; Lee, S. H.; Jazani, S.; Jang, S.; Abedi, S. A. A.; Xiagang, L.; Seo, J.; Ha, T.; Chang, Y. T.*, Ryu, S. H.* Nat. Methods, 2025, 22(3), 550-558.

PF555-NHS1

Cat. No. PF004

Chemical structure



Order: www.senprobe.com/PFNHS1

Known Property:	Super-photostable dye
Molecular Weight:	755.85 ($C_{36}H_{41}N_3O_{11}S_2$)
λex / λem:	555 / 567 nm
Application:	Labeling using amide coupling reaction
Cell selectivity mechanism:	Not applicable
Related probes:	PF555-NHS2

PF555 (Phoenix Fluor 555) is a cyanine-based orange-red fluorescent dye with a novel backbone structure known as 3-oxo-cyanine. It exhibits exceptional photostability and low oxygen sensitivity during fluorescence imaging. Thanks to its unique properties, **PF555** enables long-term live-cell imaging without the need for scavengers. Observing the internalization and recycling of EGFR (Epidermal Growth Factor Receptor) is often challenging with commercial dyes due to their limited photostability and short observation windows. However, the superior photostability of **PF555** allows for successful visualization of these processes.

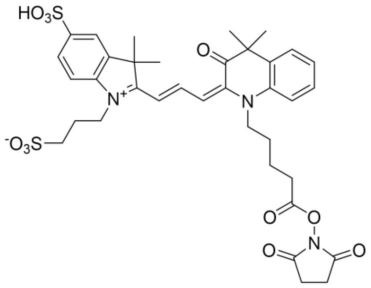
Reference:

1. **Super-Photostable Organic Dye for Long-Term Live-cell Single Protein Imaging**, Kim, D. H.*; Triet, H. M.; Lee, S. H.; Jazani, S.; Jang, S.; Abedi, S. A. A.; Xiagang, L.; Seo, J.; Ha, T.; Chang, Y. T.*, Ryu, S. H.* Nat. Methods, 2025, 22(3), 550-558.

PF555-NHS2

Cat. No. PF005

Chemical structure



Order: www.senprobe.com/PFNHS2

Known Property:	Super-photostable dye
Molecular Weight:	755.85 ($C_{36}H_{41}N_3O_{11}S_2$)
λex / λem:	555 / 567 nm
Application:	Labeling using click chemistry
Cell selectivity mechanism:	Not applicable
Related probes:	PF555-NHS1

PF555 (Phoenix Fluor 555) is a cyanine-based orange-red fluorescent dye with a novel backbone structure known as 3-oxo-cyanine. It exhibits exceptional photostability and low oxygen sensitivity during fluorescence imaging. Thanks to its unique properties, **PF555** enables long-term live-cell imaging without the need for scavengers. Observing the internalization and recycling of EGFR (Epidermal Growth Factor Receptor) is often challenging with commercial dyes due to their limited photostability and short observation windows. However, the superior photostability of **PF555** allows for successful visualization of these processes.

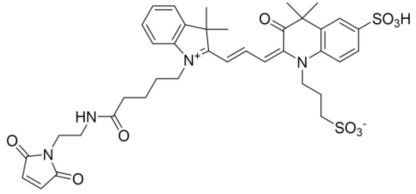
Reference:

1. **Super-Photostable Organic Dye for Long-Term Live-cell Single Protein Imaging**, Kim, D. H.*; Triet, H. M.; Lee, S. H.; Jazani, S.; Jang, S.; Abedi, S. A. A.; Xiagang, L.; Seo, J.; Ha, T.; Chang, Y. T.*, Ryu, S. H.* Nat. Methods, 2025, 22(3), 550-558.

PF555-Mal1

Cat. No. PF006

Chemical structure



Order: www.senprobe.com/PFMal1

Known Property:	Super-photostable dye
Molecular Weight:	780.91 ($C_{38}H_{44}N_4O_{10}S_2$)
λex / λem:	555 / 567 nm
Application:	Labeling using maleimide-thiol reaction
Cell selectivity mechanism:	Not applicable
Related probes:	PF555-Mal2

PF555 (Phoenix Fluor 555) is a cyanine-based orange-red fluorescent dye with a novel backbone structure known as 3-oxo-cyanine. It exhibits exceptional photostability and low oxygen sensitivity during fluorescence imaging. Thanks to its unique properties, **PF555** enables long-term live-cell imaging without the need for scavengers. Observing the internalization and recycling of EGFR (Epidermal Growth Factor Receptor) is often challenging with commercial dyes due to their limited photostability and short observation windows. However, the superior photostability of **PF555** allows for successful visualization of these processes.

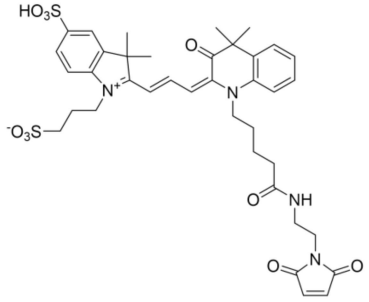
Reference:

1. **Super-Photostable Organic Dye for Long-Term Live-cell Single Protein Imaging**, Kim, D. H.*; Triet, H. M.; Lee, S. H.; Jazani, S.; Jang, S.; Abedi, S. A. A.; Xiagang, L.; Seo, J.; Ha, T.; Chang, Y. T.*, Ryu, S. H.* Nat. Methods, 2025, 22(3), 550-558.

PF555-Mal2

Cat. No. PF007

Chemical structure



Order: www.senprobe.com/PFMal2

Known Property:	Super-photostable dye
Molecular Weight:	780.91 ($C_{38}H_{44}N_4O_{10}S_2$)
λex / λem:	555 / 567 nm
Application:	Labeling using maleimide-thiol reaction
Cell selectivity mechanism:	Not applicable
Related probes:	PF555-Mal1

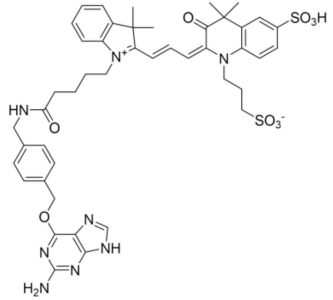
PF555 (Phoenix Fluor 555) is a cyanine-based orange-red fluorescent dye with a novel backbone structure known as 3-oxo-cyanine. It exhibits exceptional photostability and low oxygen sensitivity during fluorescence imaging. Thanks to its unique properties, **PF555** enables long-term live-cell imaging without the need for scavengers. Observing the internalization and recycling of EGFR (Epidermal Growth Factor Receptor) is often challenging with commercial dyes due to their limited photostability and short observation windows. However, the superior photostability of **PF555** allows for successful visualization of these processes.

Reference:

1. **Super-Photostable Organic Dye for Long-Term Live-cell Single Protein Imaging**, Kim, D. H.*; Triet, H. M.; Lee, S. H.; Jazani, S.; Jang, S.; Abedi, S. A. A.; Xiagang, L.; Seo, J.; Ha, T.; Chang, Y. T.*, Ryu, S. H.* Nat. Methods, 2025, 22(3), 550-558.

PF555-BG1
Cat. No. PF008

Chemical structure



Order: www.senprobe.com/PFBG1

Known Property:	Super-photostable dye
Molecular Weight:	911.06 ($C_{45}H_{50}N_8O_9S_2$)
λex / λem:	555 / 567 nm
Application:	Labeling using Benzylguanine labeling
Cell selectivity mechanism:	Not applicable
Related probes:	PF555-BG2

PF555 (Phoenix Fluor 555) is a cyanine-based orange-red fluorescent dye with a novel backbone structure known as 3-oxo-cyanine. It exhibits exceptional photostability and low oxygen sensitivity during fluorescence imaging. Thanks to its unique properties, **PF555** enables long-term live-cell imaging without the need for scavengers. Observing the internalization and recycling of EGFR (Epidermal Growth Factor Receptor) is often challenging with commercial dyes due to their limited photostability and short observation windows. However, the superior photostability of **PF555** allows for successful visualization of these processes.

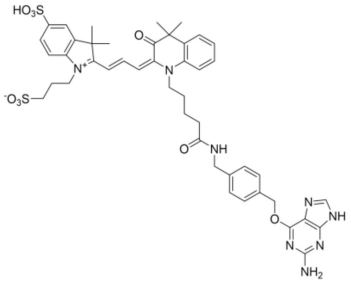
Reference:

1. **Super-Photostable Organic Dye for Long-Term Live-cell Single Protein Imaging**, Kim, D. H.*; Triet, H. M.; Lee, S. H.; Jazani, S.; Jang, S.; Abedi, S. A. A.; Xiagang, L.; Seo, J.; Ha, T.; Chang, Y. T.*, Ryu, S. H.* Nat. Methods, 2025, 22(3), 550-558.

PF555-BG2

Cat. No. PF009

Chemical structure



Order: www.senprobe.com/PFBG2

Known Property:	Super-photostable dye
Molecular Weight:	911.06 ($C_{45}H_{50}N_8O_9S_2$)
λex / λem:	555 / 567 nm
Application:	Labeling using Benzylguanine labeling
Cell selectivity mechanism:	Not applicable
Related probes:	PF555-BG1

PF555 (Phoenix Fluor 555) is a cyanine-based orange-red fluorescent dye with a novel backbone structure known as 3-oxo-cyanine. It exhibits exceptional photostability and low oxygen sensitivity during fluorescence imaging. Thanks to its unique properties, **PF555** enables long-term live-cell imaging without the need for scavengers. Observing the internalization and recycling of EGFR (Epidermal Growth Factor Receptor) is often challenging with commercial dyes due to their limited photostability and short observation windows. However, the superior photostability of **PF555** allows for successful visualization of these processes.

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1. **Super-Photostable Organic Dye for Long-Term Live-cell Single Protein Imaging**, Kim, D. H.*; Triet, H. M.; Lee, S. H.; Jazani, S.; Jang, S.; Abedi, S. A. A.; Xiagang, L.; Seo, J.; Ha, T.; Chang, Y. T.*, Ryu, S. H.* Nat. Methods, 2025, 22(3), 550-558.

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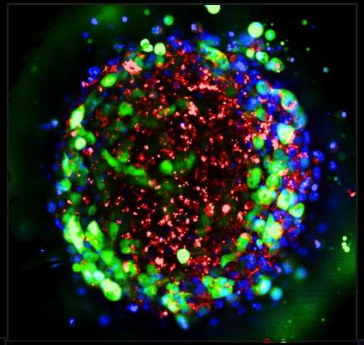

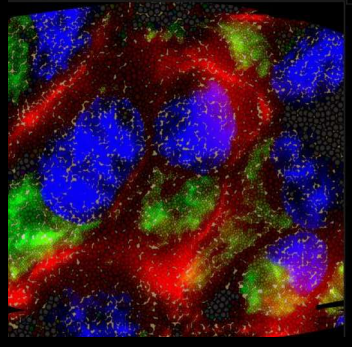

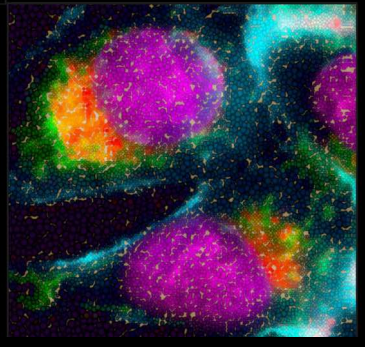

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