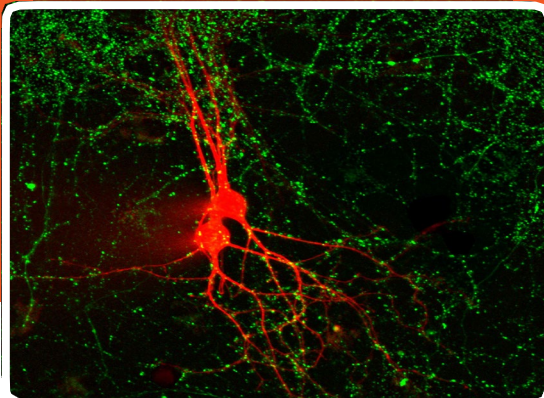


Neuronal Tracers & Reagents



Fluorescent dyes and toxins for neuronal tracing and more

Nerve Terminal Dyes:

NeuroTracer Green & NeuroTracer Red

They have a lipophilic tail at one end and a highly hydrophilic, cationic head group at the other end. They are virtually non-fluorescent in solution, but when added to cells, insertion of the lipophilic tails into the plasma membrane causes the dyes to become intensely fluorescent.

These dyes can be used to label membranes and vesicles in many cell types, but they are commonly called nerve terminal dyes or synaptic vesicle dyes due to their utility for dynamic tracking of synaptic vesicles in cultured neurons and tissue preparations). When applied to neurons, the dyes are incorporated into synaptic vesicles by endocytosis (termed the "on-rate"). After extracellular dye is quenched or washed away, the fluorescent vesicles can be imaged over time. During exocytosis and neurotransmitter release, the dyes are also released from the vesicles, causing a decrease in fluorescence signal (or "off-rate").

C18 and AM3-25 are high molecular weight dyes that cannot pass through ion channels that have been used as controls to distinguish mechanisms of dye uptake.

Nerve Terminal Dyes

Cat.n.	Product Name	Ex/Em in membranes	Fixable?	Size
IS44007	FM 2-10	~480/600 nm	No	5 mg
IS02007	FM 1-43	~480/600 nm	No	5 mg
IS64007	FM 1-84	~480/600 nm	No	5 mg
IS84007	FM 3-25	~480/600 nm	No	5 mg
IS12007	FM 4-64	~510/750 nm	No	5 mg
IS91007	FM 5-95	~510/750 nm	No	5 mg

Background Quenchers and Nerve Terminal Staining Kits

A common problem encountered with nerve terminal dyes is background fluorescence due to residual membrane staining after washing. To reduce extracellular fluorescence, we offer three quencher or dye-clearing agents. ADVASEP-7, a sulfonated β -cyclodextrin, binds dyes and allows them to be more efficiently washed away. SCAS is a quencher that reduces dye fluorescence without the need for washing. Sulforhodamine 101 quenches NeuroTracer Green background by fluorescent resonance energy transfer (FRET). We also offer Nerve Terminal Staining Kits that pair dyes with background reducers.

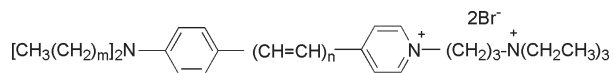


Figure 2. General structure of NeuroTracer Green and NeuroTracer Red dyes. $m = 0-17$; $n = 1-3$.

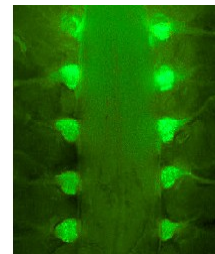


Figure 3. Neurons in mouse dorsal root ganglia (DRG) labeled with AM1-43. Image courtesy of Dr. David Corey, Harvard Medical School.

Amyloid Stains Fluorojade Histofluorescent Stain for Neurodegeneration

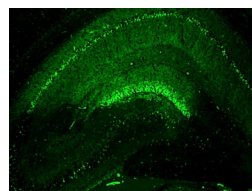
Congo Red is commonly used to detect amyloid protein aggregates associated with Alzheimer's disease, Bovine Spongiform Encephalopathy, and related diseases. The staining can be detected by either colorimetric or fluorescence imaging (Ex/Em 497/614 nm).

DCDAPH is a far-red fluorescent probe (Ex/Em 597/665 nm) with high affinity ($K_d=27$ nM) to $A\beta_{1-42}$ aggregates. It has been used for fluorescent staining of brain sections, as well as *in vivo* small animal near-IR imaging.

Thioflavin T is a cell-permeable benzothiazole dye that exhibits enhanced fluorescence (Ex/Em 450/482 nm) upon binding to amyloid fibrils. Thioflavin T has also been used in histology and for protein characterization.

Fluorojade is an anionic green fluorescent dye functionally similar to Fluoro-Jade® dyes. These dyes stain degenerating neurons and their processes in brain sections and cell culture

Cat.n.	Product Name	Ex/Em	Size
IS82008	Congo Red High Purity Grade	497/614 nm	100 mg
IS03008	DCDAPH	597/665 nm	5 mg
IS33008	Thioflavin T High Purity Grade	450/482 nm	100 mg
IS72008-50mL	FluorojadeHistofluorescent Stain	497/520 nm	50 ml



Degenerating neurons in a slice of mouse hippocampus stained with Fluorojade Histofluorescent Stain.

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Toxins and Fluorescent Receptor Probes

Cat.n.	Product Name	Ex/Em	Unit Size
IS06000	Tetrodotoxin, Citrate-Free	N/A	1 mg
IS160000	Tetrodotoxin, With Citrate	N/A	1 mg
IS01000-1	α -Bungarotoxin	N/A	1 mg
IS71000	Biotin-XX α -Bungarotoxin	N/A	0.5 mg
IS31000	α -Bungarotoxin fitc	494/518 nm	10x50 ug
IS41000	α -Bungarotoxin TRITC	553/577 nm	10 X 50 ug
IS61000	- α Bungarotoxin (Texas593/613 nm Red®)	593/613 nm	10 X50 ug
IS50000	a- Bungarotoxin Alexa 488	490/515 nm	100 ug
IS62000	a- Bungarotoxin Alexa 546	541/560nm	100 ug
IS81000	a- Bungarotoxin Alexa 555	555/565nm	100 ug
IS7000	a- Bungarotoxin Alexa 594	593/614nm	100 ug
IS900	a- Bungarotoxin Alexa 633	630/650 nm	100 ug
IS07000	Cholera Toxin B Alexa 488	490/515 nm	100 ug
IS57000	Cholera Toxin B Alexa 546	541/560 nm	100 ug
IS17000	Cholera Toxin B Alexa 568	562/583 nm	100 ug
IS27000	Cholera Toxin B Alexa 594	593/614 nm	100 ug
IS77000	Cholera Toxin B Alexa 633	630/650 nm	100 ug

Tetrodotoxin

Tetrodotoxin (TTX) reversibly blocks excitable sodium channels and has been a widely used tool for studies of excitable membranes of nerve and muscle cells. Available lyophilized in citrate buffer, or citrate-free.

Bungarotoxin and Fluorescent Conjugates

α -Bungarotoxin is a potent inhibitor for the motor endplate acetylcholine receptor. Fluorescent conjugates of α -bungarotoxin can be used to label neuromuscular junctions

Cholera Toxin Subunit B Conjugates

Cholera toxin subunit B binds GM1 ganglioside in lipid rafts, and is used as a retrograde neuronal tracer.

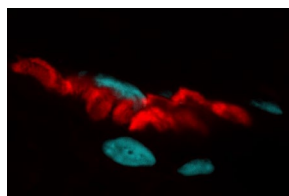


Figure 4. Rat skeletal muscle cryosection stained with Alexa594 α -bungarotoxin (motor endplate, red) and DAPI (nuclei, blue).

Cytosolic Tracer Dyes

Alexa Dye Hydrazides

Hydrazides are non-toxic, highly water soluble membrane-impermeant tracers that can be used to fill cells by microinjection

Lucifer Yellow and Related Dyes

Lucifer Yellow is a classic cell-impermeant cytosolic and gap junction dye. We also offer Lucifer Yellow Cadaverine and Lucifer Yellow CH with aldehyde-fixable groups.

Biotin derivatives

Formaldehyde-fixable biocytin and biocytin hydrazide are widely used microinjectable polar tracers. Biocytin has been used as an anterograde tracer and gap junction probe. Biotin derivatives can be detected with labeled streptavidin or anti-biotin antibodies. Neurobiotin™, a useful anterograde and transneuronal tracer.

Cat.n.	Product Name	Ex/Em	Unit Size
IS51008	Lucifer Yellow CH, lithium salt	428/536 nm	25 mg
IS61008	Lucifer Yellow CH, potassium salt	428/536 nm	25 mg
IS81008	Lucifer Yellow Cadaverine	428-536 nm	25 mg
IS71008	Lucifer Yellow Cadaverine Biotin-X, dipotassium salt	428-532 nm	10 mg
IS55009	Biocytin	N/A	100 mg
IS06009	Biocytin Hydrazide	N/A	25 mg
IS75009	Neurobiotin	N/A	25 mg
IS57009	Biotin ethylenediamine, hydrochloride	N/A	25 mg
IS62003	Calcein AM Cell Viability Assay Kit	494/517 nm*	500 assays
IS25129	Alexa Dye Hydrazide Alexa 488	490/515 nm	1 mg
IS35129	Alexa Dye Hydrazide Alexa 555	555-565 nm	1 mg
IS45129	Alexa Dye Hydrazide Alexa 568	562/583 nm	1 mg
IS85129	Alexa Dye Hydrazide Alexa 594	593/614 nm	1 mg
IS65129	Alexa Dye Hydrazide Alexa 633	630/650 nm	1mg
IS63129	Alexa Dye Hydrazide Alexa 647	650/665 nm	1mg

Anterograde and Retrograde Neuronal Tracers

Wheat Germ Agglutinin (WGA) Conjugates

WGA is a glycoprotein-binding lectin that has been used for retrograde and anterograde neuronal tracing.

Dextran Conjugates

Labeled dextran amine can be used for both retrograde and anterograde tracing. CF® dye dextrans are anionic with an aldehyde-fixable free amine group, and are available with a wide selection of colors and a range of molecular weights.

Fluoro-Gold™

Fluoro-Gold™ has been used extensively as a retrograde tracer for neurons and also a histochemical stain. Fluoro-Gold™ is used for retrograde tracing and dendrite filling.

Cholera Toxin Subunit B (see above)

Biotin Ethylenediamine (see above)

Cat.n.	Product Name	Ex/Em	Size
IS41008	Fluoro-Gold	361-536 nm	10 mg
IS32008	Fluoro-Gold, 4% in H2O	361-536 nm	200 ul
IS22092	WGA Alexa 488	490/515 nm	1 mg
IS46092	WGA Alexa 546	541/560 nm	1 mg
IS67092	WGA Alexa 555	555/565 nm	1 mg
IS77092	WGA Alexa 568	562/583 nm	1 mg
IS32092	WGA Alexa 594	593/614 nm	1 mg
IS42092	WGA Alexa 633	630/650 nm	1 mg
IS01108	Dextran 10 K MW Alexa 488	490/515 nm	1 mg
IS11108	Dextran 10 K MW Alexa 546	541/560 nm	1 mg
IS21108	Dextran 10 K MW Alexa 555	555-565 nm	1 mg
IS31108	Dextran 10 K MW Alexa 568	562/583 nm	1 mg
IS41108	Dextran 10 K MW Alexa 488	593/614 nm	1 mg
IS62108	Dextran 40 K MW Alexa 488	490/515 nm	1 mg
IS71108	Dextran 70 K MW Alexa 488	490/515 nm	1 mg
IS13108	Dextran 150 K MW Alexa 488	490/515 nm	1 mg
IS43108	Dextran 250 K MW Alexa 488	490/515 nm	1 mg

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