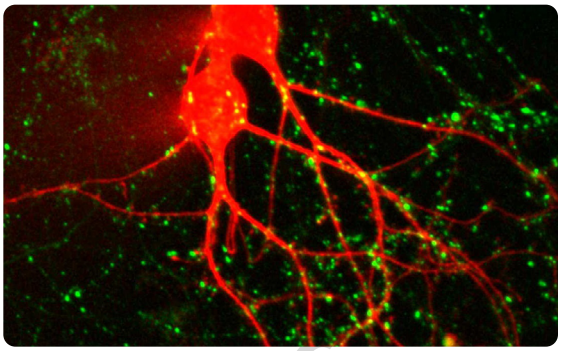
Powerful Probes & Reagents for Neuroscience

Single-domain antibodies, nerve terminal dyes, receptor probes, and more.



Biotium offers many fluorescent products that enable scientists to visualize and track neuronal structures, activity, and connectivity. Many of our neuroscience products feature CF® Dyes for exceptional sensitivity and signal-to-noise. Whether you're studying neural development, synaptic function, neurodegenerative diseases, or neuronal networks, Biotium's probes and stains provide the tools you need to illuminate the path forward in your discoveries.

Next-Generation MiniMab™ Single-Domain Antibodies

MiniMab™ Antibodies are engineered recombinant single-domain antibodies (SdAbs) designed for maximum performance in fluorescence detection applications. MiniMab™ Antibodies are available conjugated to a wide range of Biotium's industry-leading CF® Dyes, including best-in-class options for super-resolution imaging by STORM.

MiniMab™ Single-Domain Antibody Features

- Specialized for neuroscience targets
- Better tissue penetration, solubility, stability, and faster staining than IgG antibodies
- Minimal epitope-dye displacement for super-resolution imaging
- Conjugated to bright, photostable CF® Dyes, including near-IR CF®740
- Available with Biotium's top-performing dyes for STORM

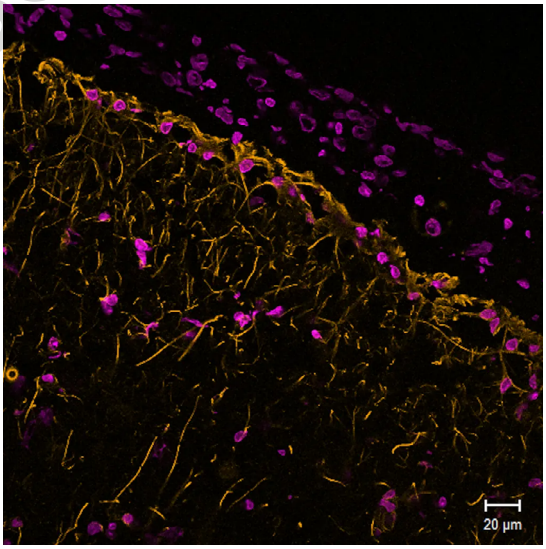


Figure 1. PFA-fixed rat brain cryosection stained with MiniMab™ GFAP SdAb (VHH) CF®568 conjugate (orange) and NucSpot® 680/700 (magenta). Scale bar: 20 um.

MiniMab™ Single-Domain Antibodies

Cat. No.	Product
N001	GFAP Recombinant Alpaca VHH (SdAb2409.GFAP)
N002	SYT1 Recombinant Alpaca VHH (SdAb2501.SYT1)
N003	VGLUT1 Recombinant Alpaca VHH (SdAb2412.VGLUT1)
N004	Alpaca Anti-Mouse IgG1 (Fc), rVHH (N2504.M1FC)

We regularly release new neuroscience antibodies, scan the QR code for the full list.

Biotium Choice IgG Antibodies

Cat. No.	Product
P034	ZO-1 Recombinant Monoclonal Mouse Antibody (rZO1-1A12)
P035	Neurofilament-H Recombinant Monoclonal Mouse Antibody (rRmdO-20)
P036	PSD95 Recombinant Monoclonal Mouse Antibody (rK28/43)
P037	NeuN Recombinant Monoclonal Mouse Antibody (rA60)

DOMINIQUE DUTSCHER SAS

Nerve Terminal Dyes

Track synaptic activity with SynaptoGreen™ and SynaptoRed™ nerve terminal dyes (originally FM® Dyes) designed for endocytic vesicle labeling in neurons and other cells. These membrane-selective dyes offer activity-dependent fluorescence and fixable options for immunostaining. Minimize background with SCAS, ADVASEP-7, and Sulforhodamine 101 background reducers and quenchers, available individually or in convenient kits.

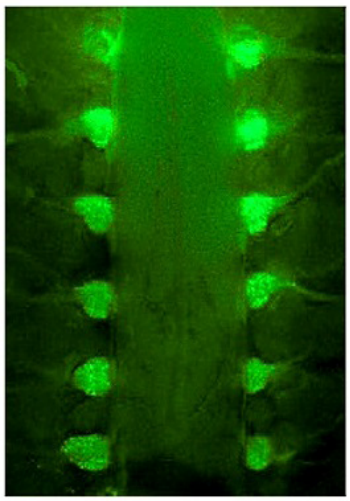


Figure 2. Neurons in mouse dorsal root ganglia (DRG) labeled with AM1-43. Image courtesy of Dr. David Corey, Harvard Medical School.

Nerve Terminal Dyes

Cat. No.	Product
70042, 70043	SynaptoGreen™ C1
70044, 70045	SynaptoGreen™ C2 (equivalent to FM®2-10)
70023, 70026	SynaptoGreen™ C3
70020, 70022	SynaptoGreen™ C4 (equivalent to FM®1-43)
70046, 70047	SynaptoGreen™ C5 (equivalent to FM®1-84)
70048, 70049	SynaptoGreen™ C18 (equivalent to FM®3-25)
70024	AM1-43
70038	AM1-44
70036	AM2-10
70051	AM3-25
70053	HM1-43
70040, 70041	SynaptoRed™ C1
70021, 70027	SynaptoRed™ C2 (equivalent to FM®4-64)
70019, 70028	SynaptoRed™ C2M (equivalent to FM®5-95)
70025	AM4-64
70039	AM4-65
70050	AM4-66

Nerve Terminal Staining Kits

Nerve Terminal Staining Kit	Nerve Terminal Dye	Background Reducer	Cat. No.
Nerve Terminal Staining Kit I	SynaptoGreen™ C4 (5 x 1 mg)	ADVASEP-7 (250 mg)	70030
Nerve Terminal Staining Kit II (A)	AM1-43 (1 mg)	ADVASEP-7 (100 mg)	70031
Nerve Terminal Staining Kit II (B)	AM1-43 (1 mg)	SCAS (100 mg)	70031-1
Nerve Terminal Staining Kit III	SynaptoGreen™ C4 (5 x 1 mg)	Sulforhodamine 101 (100 mg)	70032
Nerve Terminal Staining Kit V	SynaptoRed™ C2 (5 x 1 mg)	ADVASEP-7 (250 mg)	70034

Anterograde & Retrograde Axonal Tracers

Enhance your neuronal tracing studies with Biotium's retrograde and anterograde tracers, ideal for brain mapping, dendrite filling, and transneuronal tracing in fixed or live tissue. Choose from hydroxystilbamidine (Fluoro-Gold™), Neurobiotin™ (similar to Fluoro-Jade®), and fluorescent conjugates of Cholera Toxin Subunit B, WGA, and dextran amines. Stain options include unlabeled tracers and tracers labeled with bright, photostable CF® Dyes.

Scan this QR code for detailed product information on our tracers.

Anterograde & Retrograde Tracers

Cat. No.	Product
80014	Hydroxystilbamidine (Fluoro-Gold™)
80023	Hydroxystilbamidine (Fluoro-Gold™), 4% in H_2O
90057	Biotin Ethylenediamine, Hydrobromide (Neurobiotin™)
90075	Biotin Ethylenediamine, Hydrochloride
00068... 29127	Cholera Toxin Subunit B CF® Dye Conjugates
29021... 29095	Wheat Germ Agglutinin (WGA) Conjugates
80110... 80141	Dextran Conjugates

DOMINIQUE DUTSCHER SAS

Neurotoxins & Fluorescent Toxin-Based Receptor Probes

α-Bungarotoxin is a high-affinity inhibitor of nicotinic acetylcholine receptors, commonly used to label motor endplates when conjugated to bright, photostable CF® Dyes. Tetrodotoxin is a reversible blocker of voltage-gated sodium channels, widely used to study excitable membranes in neurons and muscle. Cholera Toxin Subunit B binds GM1 gangliosides in lipid rafts and is frequently used as a neuronal tracer or endocytic marker in live and fixed cell imaging.

Scan the QR code to for more information on Biotium's neurotoxin and fluorescent toxin-based receptor probes.

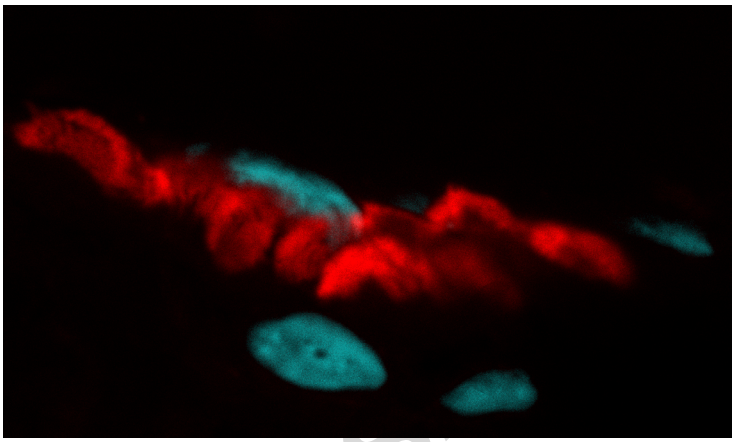


Figure 3. Neuromuscular junction endplate in a rat skeletal muscle cryosection stained with CF®594 α-Bungarotoxin (red). Nuclei are stained with DAPI (blue).

Neurotoxins & Fluorescent Toxin-Based Receptor Probes

Probe Type	Cat. No.	Product
α-Bungarotoxin	00010-1	α-Bungarotoxin
	00002... 00026	α-Bungarotoxin, CF® Dye and Other Conjugates
Tetrodotoxin	00060	Tetrodotoxin, Citrate-Free
	00061	Tetrodotoxin, with Citrate
Cholera Toxin Subunit B	00068... 29127	Cholera Toxin Subunit B CF® Dye Conjugates

Amyloid Stains & Neurodegeneration Dyes

Biotium offers a range of fluorescent dyes for detecting amyloid aggregates and neurodegeneration in brain tissue. Classic dyes like Congo Red and Thioflavin T are well-established tools for visualizing amyloid fibrils, while DCDAPH (DANIR-2c) stains specific aggregated protein structures in the far-red channel in tissue and is useful for *in vivo* applications. For imaging neurodegeneration, the scientists at Biotium created PathoGreen™ Histofluorescent Stain, an anionic green fluorescent dye functionally similar to Fluoro-Jade®.

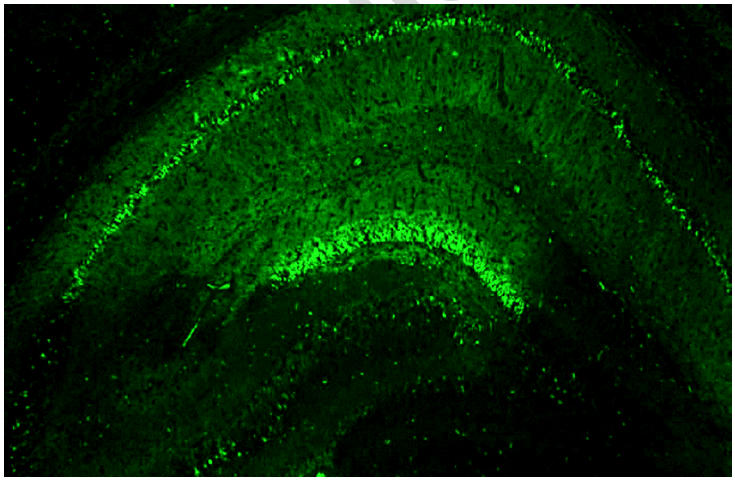


Figure 4. Section of mouse hippocampus stained with PathoGreen™. Degenerating neurons are stained green.

Amyloid & Neurodegeneration Stains

Cat. No.	Product	Ex/Em (nm)
80028	Congo Red, High Purity	497/614
80030	DCDAPH (DANIR-2c)	597/665
80033	Thioflavin T, High Purity	450/482
80027	PathoGreen™ Histofluorescent Stain, 1000X in Water	497/520

Scan this QR code to learn more about Biotium's amyloid and neurodegeneration detection reagents.

UQE DUTSCHER

Cytosolic Tracers for Cell Morphology & Gap Junctions

Choose from Biotium's fluorescent CF® Dye biotin and biocytin conjugates for anterograde and gap junction tracing. Biotin ethylenediamine (Neurobiotin™) is another useful anterograde and transneuronal tracer. Biotium offers fixable ViaFluor® SE membrane-permeant cytosolic stains in blue, green, or far-red, CF® Dye Hydrazides for microinjection, calcein AM, and Lucifer Yellow, which is a classic cell-impermeant cytosolic and gap junction dye.

Cytosolic Tracers & Fluid Phase Markers

Cat. No.	Product
92136... 96025	CF® Dye Hydrazides
80013	Calcein
30026	Calcein AM
30050... 30139	ViaFluor® SE Dyes
80015... 80026	Lucifer Yellow Derivatives
80014... 80023	Hydroxystilbamidine (equivalent to Fluoro-Gold™)
90057	Biotin Ethylenediamine, Hydrobromide (Neurobiotin™)
80029... 80038	CF® Dye Biotin
92004... 92007	CF® Dye Biocytin

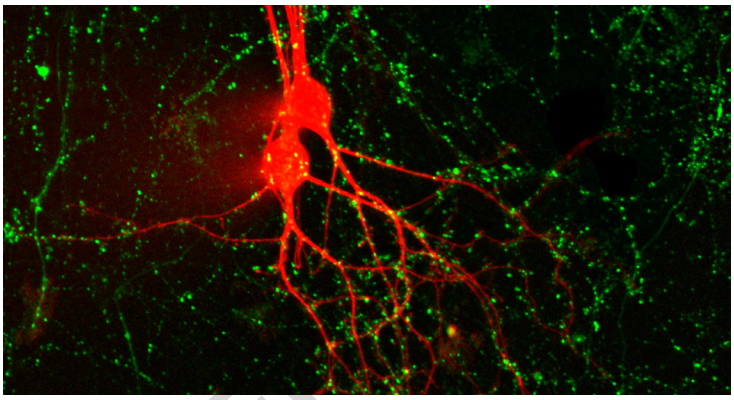


Figure 5. Cultured rat hippocampal neurons microinjected with CF®647 hydrazide (red) and stained with SynaptoGreen™ C4 (green). Image courtesy of Professor Guosong Liu, Tsinghua University.

Scan the QR code to explore Biotium's full range of biotin derivatives, cytosolic tracers, and cell-permeant dyes for neuronal labeling and cell tracking.

Membrane Potential Dyes

Monitor membrane potential with Biotium's comprehensive range of slow- and fast-response voltage-sensitive dyes. Slow-response dyes like DiBAC4(3), DiOC2(3), and TMRE/TMRM offer large fluorescence changes ideal for depolarization studies. Fast-response styryl dyes, including Di-4-ANNEPS, Di-8-ANEPPS, and RH probes, provide rapid, sensitive detection of neural and cardiac activity. A DiO/DPA FRET-based membrane potential kit is available.

Slow-Responding Membrane Potential Dyes

Cat. No.	Product	Ex/Em (nm)
61011	$DiBAC_4(3)$	493/516
70008	$DiOC_2(3)$	482/497
70007	$DiOC_5(3)$	482/497
70009	$DiOC_6(3)$	484/501
70005	TMRE, 2 mM in DMSO	549/574
70016	TMRE	549/574
70017	TMRM	548/573

Neurobiotin is a trademark of Vector Laboratories; FM is a registered trademark of Thermo Fisher Scientific; Fluoro-Gold is a trademark of Fluorochrome, LLC; Fluoro-Jade is a registered trademark of Histo-Chem, Inc.

Scan the QR code to view Biotium's voltage-sensitive dye catalog for precise membrane potential imaging in cells and tissues.

Fast-Responding Membrane Potential Dyes

Cat. No.	Product	Ex/Em (nm)
61010	Di-4-ANEPPS	496/705[1]
61012	Di-8-ANEPPS	498/713[1]
61013	Di-2-ANEPEQ (JPW 1114)	See Note 2
61014	Di-8-ANEPPQ	
61015	Di-12-ANEPPQ	
61018	RH237	528/782
61016	RH414	532/706
61017	RH421	515/704
61019	RH795	530/712
30037	DiO/DPA Membrane Potential Kit	484/501

[1]Ex/Em is shown for dyes in methanol. In cell membranes, spectra of styryl dyes are typically blue-shifted by as much as 20 nm for absorption/excitation and 80 nm for emission.
[2]Spectrally similar to the ANEPPS dyes.

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