Catalog Number:  FS-1001

Product Name:  NeuroVue® Maroon  Filter For Neuronal Tract Tracing

Product Description:  1 cm² nylon filter coated with the lipophilic far-red emitting dye, NeuroVue Maroon. Typical dye loading: 11-14nmoles/mm²

Figure 1: Spectra of NeuroVue Maroon. (ex max = 647nm; em max = 667nm)

Storage/Stability:  Store in the dark at room temperature.

Applications:  NeuroVue Maroon has been found to be useful for tracing neuronal connections in animal tissues fixed in formaldehyde (1, 2, 4-12, 14, 16-21, 23-25). Like other lipophilic tracers (13, 15), it readily transfers into plasma membranes in fixed and/or live tissues and diffuses laterally within the membrane, eventually labeling the entire cell body as well as the finest axonal and dendritic branches, and allowing visualization of neuronal processes up to several millimeters distant from the point of dye insertion (1, 2, 4-12, 14, 16-21, 23-25).

NeuroVue Maroon is provided in coated filter format because insertion of small dye coated filter segments has been shown to be a simple, reliable method for labeling well defined tissue regions, avoiding known artifacts associated with labeling via high pressure microinjection or insertion of dye crystals on a dissecting needle (3, 13, 22). NeuroVue Maroon fluoresces in the far red (Figure 1) and exhibits minimal bleed through into filter windows typically used for visible fluorescing lipophilic tracers such as DiA, Dil, NeuroVue Red (cat. # FS-1002), NeuroVue Orange (cat. # FS-1003) or NeuroVue Jade (cat. #. FS-1006), making it an excellent choice for multicolor neurotracing studies in sections and/or whole-mount preparations (1, 2, 4-12, 14, 16-21, 23-25).
Additional Important Information

1) Filter segments of the desired size and shape can be cut using super fine Vannas scissors (one possible supplier is World Precision Instruments, Sarasota, FL, cat #500086) and inserted into the tissue at the site to be labeled. Protocol NT 001 may be downloaded for further details.

2) Diffusion times vary depending on the biological system under study and must be determined empirically. See cited references and Protocol NT 001 for potentially important variables and possible starting conditions.

3) Detection of Labeled Cells
   Note: Due to its very long red fluorescence emission, most people cannot see NeuroVue Maroon emission by eye. Detection by camera will be more sensitive than with the unaided eye
   a) Confocal microscopy.
      Detection is most efficient using the 633nm or 647nm laser line for excitation and emission filter set at 650-710nm
   b) Epifluorescence microscopy:
      Standard filter sets potentially useful for NeuroVue Maroon excitation and emission include
      - Cy5® (Chroma # 31023): exciter D640/20x , dichroic 660DCLP, emitter D680/30
      - Cy5® longpass emission (Chroma #41024), exciter HQ620/60x , dichroic Q660LP, emitter HQ665LP
      Although suboptimal, success has also been reported using a standard Texas Red filter set to detect NeuroVue Maroon.

References:


2. de Caprona MD, Beisel KW, Nichols DH, Fritzsch B. 2004. Partial behavioral compensation is revealed in balance tasked mutant mice lacking otoconia. Brain Res Bull 64:289-301. Both NeuroVue Maroon (previously PTIR271) and NeuroVue Red (previously PTIR278) were used in Figure 8 (B. Fritzsch, personal communication).


4. Fritzsch B. 2003. Development of inner ear afferent connections: forming primary neurons and connecting them to the developing sensory epithelia. Brain Res Bull 60:423-433. NeuroVue Maroon (previously PTIR271) and NeuroVue Green (previously PTIR281) were used in Figure 4a, 4c,and 4d; NeuroVue Maroon and PKH26 were used for cover image (B. Fritzsch, personal communication).

5. Fritzsch B, Tessarollo L, Coppola E, Reichardt LF. 2004. Neurotrophins in the ear: their roles in sensory neuron survival and fiber guidance. Prog Brain Res 146:265-278. NeuroVue Maroon (formerly PTIR271) and Dil were used in Figure 2 (B. Fritzsch, personal communication)


**NeuroVue Green** (previously PTIR281); **NeuroVue Red** (previously PTIR278); **NeuroVue Maroon** (previously PTIR271)

10. Gu C, Rodriguez ER, Reimert DV, Shu T, Fritzsch B, Richards LJ, Kolodkin AL, Ginty DD. 2003. Neuropilin-1 Conveys Semaphorin and VEGF Signaling during Neural and Cardiovascular Development. Dev Cell 5:45-57. **NeuroVue Maroon** (formerly PTIR271) rather than PKH26 was used in Figure 3 (B. Fritzsch, personal communication)


14. Hsieh CY, Cramer KS.  2006. Deafferentation Induces Novel Axonal Projections in the Auditory Brainstem After Hearing Onset.  J Comp Neurol 497: 589-599 **NeuroVue Red** was used for all figures except Figure 2D, for which both NeuroVue Red and DiI were used, and Figure 5A, for which Dil was used (K. Cramer, personal communication).


16. Maklad A, Fritzsch B, Hansen LA. 2004. Innervation of the maxillary vibrissae in mice as revealed by anterograde and retrograde tract tracing. Cell Tissue Res 315:167-180. **NeuroVue Maroon** (previously PTIR271) was used for Figure 6 (B. Fritzsch, personal communication)

17. Matei V, Pauley S, Kaing S, Rowitch D, Beisel KW, Morris K, Jones K, Fritzsch B. 2005. Smaller epithelia in Neurog1 null mice are related to earlier hair cell terminal mitosis. Dev Dyn, 234:633-650. **NeuroVue Maroon** (previously PTIR271) was used for Figure 8 (B. Fritzsch, personal communication)


20. Pauley S, Wright TJ, Pirvola U, Ornitz D, Beisel K, Fritzsch B. 2003. Expression and function of FGF10 in mammalian inner ear development. Dev Dyn 227:203-215. **NeuroVue Maroon** (formerly PTIR271) rather than Dil was used in Figure 7 (B. Fritzsch, personal communication)

21. Pauley, S., Matei, V., Beisel, K.W., Fritzsch, B. 2005. Wiring the Ear to the Brain: the Molecular Basis of Neurosensory Development, Differentiation, and Survival. In: Development of the ear. Eds. M. Kelley and D. Wu, SHAR, Springer Verlag, 85-120. **NeuroVue Maroon** (previously PTIR271) was used in Figure 4; see Tessarollo, J Neurosci 2004, below, for methods (B. Fritzsch, personal communication)


24. Zou D, Silvius D, Fritzsch B, Xu PX. 2004. Eya1 and Six1 are essential for early steps of sensory neurogenesis in mammalian cranial placodes. Development 131:5561-5572. **NeuroVue Maroon (previously PTIR271) and NeuroVue Red (previously PTIR278) were used for Figure 6, panels G-R (B. Fritzsch, personal communication).**


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