

## $\omega$ -Conotoxin and Fluorescent $\omega$ -Conotoxin

**C-3117**  $\omega$ -conotoxin GVIA

**C-3115**  $\omega$ -conotoxin GVIA, tetramethylrhodamine conjugate

### Quick Facts

#### Storage upon receipt:

- $-20^{\circ}\text{C}$
- Desiccate
- Protect from light

**Note:** Before opening the vial, allow product to warm to room temperature.

and protected from light. Before opening the vial, allow product to warm to room temperature. Lyophilized peptides are usually completely soluble in water, saline and other aqueous solvents. A generally suitable stock solution can be prepared by dissolving  $\omega$ -conotoxin at  $0.8\ \mu\text{g}/\text{mL}$  in phosphate-buffered saline, pH 7.4 (PBS). This approximately  $0.25\ \mu\text{M}$  stock solution should then be divided into single-use aliquots and stored at  $-20^{\circ}\text{C}$ . **PROTECT FROM LIGHT. AVOID REPEATED FREEZING AND THAWING.**

### Introduction

$\omega$ -Conotoxin GVIA is a 27-amino acid peptide toxin (molecular weight = 3037) from the cone snail *Conus geographus*. This peptide preferentially binds neuronal  $\text{Ca}^{2+}$  channels, with little effect on  $\text{Ca}^{2+}$  channels from cardiac or skeletal muscle.<sup>1</sup> Molecular Probes offers both the native (C-3117) and the tetramethylrhodamine conjugate of  $\omega$ -conotoxin GVIA (C-3115). Jones, Kunze and Angelides have reported that the fluorescent  $\omega$ -conotoxin GVIA derivative is biologically active and exhibits a  $K_d$  of 10 to 20 nM, which compares favorably with the  $K_d$  of native  $\omega$ -conotoxin (0.6 nM).<sup>2</sup> Moreover, the high-affinity binding of this fluorescent  $\omega$ -conotoxin conjugate allows researchers to visualize the voltage-gated  $\text{Ca}^{2+}$  channels on neurons. For example, tetramethylrhodamine  $\omega$ -conotoxin was used to analyze the distribution of  $\text{Ca}^{2+}$  channels on frog motor nerve terminals.<sup>3,4</sup>

### Materials

The products are supplied as lyophilized solids. Upon receipt, the lyophilized solid should be stored desiccated at  $-20^{\circ}\text{C}$

### Application

It is good practice to centrifuge the peptide conjugate solution briefly in a microcentrifuge before use; only the supernatant should then be added to the experiment. This step will eliminate any peptide aggregates that may have formed in solution, thereby reducing nonspecific background staining.

Add an aliquot of the tetramethylrhodamine  $\omega$ -conotoxin stock solution to the sample of interest, incubate, wash and examine.<sup>2-5</sup> A 10-fold dilution of  $0.25\ \mu\text{M}$  tetramethylrhodamine  $\omega$ -conotoxin conjugate yields the same  $\sim 25\ \text{nM}$  final incubation concentration previously adopted in physiological studies of hippocampal neurons.<sup>2</sup> To observe the distribution of  $\text{Ca}^{2+}$  channels with a fluorescence microscope, neurons should be labeled with a higher concentration of the  $\omega$ -conotoxin conjugate; we suggest incubating cells in a final concentration of 25–250 nM. Unlabeled  $\omega$ -conotoxin may be used as a control for nonspecific binding of the labeled peptide and for physiological studies.<sup>6-8</sup>

### Warning

**$\omega$ -Conotoxin GVIA is toxic and should be handled with appropriate care. The lowest lethal dose (LDLo) has been determined to be  $50\ \mu\text{g}/\text{kg}$  in animal tests (mouse).**

### References

1. Biochemistry 26, 820 (1987);
2. Science 244, 1189 (1989);
3. J Neurosci 11, 1032 (1991);
4. Trends Neurosci 20, 404 (1997);
5. Neuron 5, 773 (1990);
6. Methods Neurosci 8, 202 (1992);
7. Toxicol 34, 183 (1996);
8. Neuron 17, 969 (1996).

**Product List** Current prices may be obtained from our Web site or from our Customer Service Department.

Cat #	Product Name	Unit Size
C-3117	$\omega$ -conotoxin GVIA .....	5 x 10 $\mu\text{g}$
C-3115	$\omega$ -conotoxin GVIA, tetramethylrhodamine conjugate .....	5 $\mu\text{g}$

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