

## Latrunculins A and B

### Quick Facts

#### Storage upon receipt:

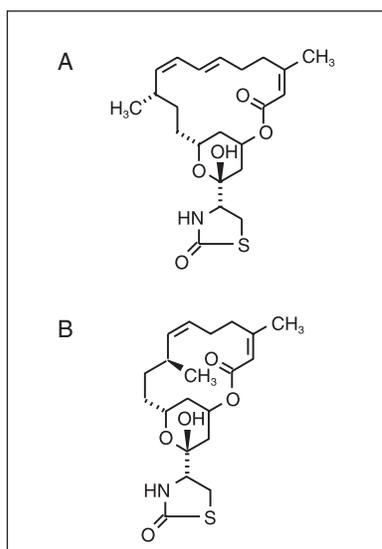
- $\leq -20^{\circ}\text{C}$
- Desiccate

#### Absorption:

- $215 \pm 3$  nm (latrunculin A in methanol)
- $212 \pm 3$  nm (latrunculin B in methanol)

### Introduction

Latrunculins A and B are cell-permeant macrolides containing the rare 2-thiazolidinone ring. Latrunculin A has a 16-member ring, and latrunculin B a 14-member ring (Figure 1). These marine toxins are derived from sponges and nudibranchs, most notably the Red Sea sponge *Negombata magnifica*, formerly *Latrunculia magnifica*. Latrunculins disrupt microfilament polymerization due to a one-to-one binding with monomeric G-actin but have no effect on microtubular structure.<sup>1-7</sup> Latrunculin A inhibits binding of thymosin  $\beta_4$  and nucleotide exchange on actin, but does not inhibit binding by profilin or DNase I.<sup>5</sup> Latrunculin A is more potent than latrunculin B, with both showing 10- to 100-fold greater potency than cytochalasins.<sup>3,6</sup>



**Figure 1.** Structures of latrunculin A (top) and latrunculin B (bottom).

### Contents

Latrunculins are provided as a lyophilized powder that is stable for 2 to 3 years when stored at  $\leq -20^{\circ}\text{C}$  and desiccated. They should be reconstituted in either anhydrous DMSO or ethanol (100 mg/mL for latrunculin A; 25 mg/mL for latrunculin B), stored at  $\leq -20^{\circ}\text{C}$ , desiccated, and protected from light. Stock solutions are stable for at least 2 to 3 months at  $\leq -20^{\circ}\text{C}$ , with latrunculin A exhibiting slightly better stability than latrunculin B. Latrunculin B should not be used in the presence of serum containing media. Both are sensitive to acids and bases, however latrunculin A is the more labile of the two in the presence of these agents.<sup>2</sup>

### Notes

The experiments described below are summarized from various peer-reviewed scientific journal articles. See *References* for specific citations.

#### Cell-Based Assays

Latrunculin A has a  $K_d$  of 180 nM–220 nM (as determined by measuring changes in fluorescence intensity with pyrene-labeled purified rabbit skeletal muscle actin in 5 mM Tris pH 7.8 containing 0.1 mM  $\text{CaCl}_2$ , 2 mM  $\text{MgCl}_2$ , 0.2 mM ATP, 0.2 mM DTT, 0.1% sodium azide at  $25^{\circ}\text{C}$ );<sup>2</sup> latrunculin B has a  $K_d$  of  $\sim 200$  nM.<sup>6</sup>

Latrunculin treatment caused complete rounding up of cells (mouse neuroblastoma and hamster fibroblasts) at 0.1–0.2  $\mu\text{g/mL}$  (latrunculin A) and 0.5  $\mu\text{g/mL}$  (latrunculin B) after 1 hour incubation. At 0.04–0.05  $\mu\text{g/mL}$  of latrunculin A, most cells retained their normal shape, but some cells contracted and adopted aberrant morphologies.<sup>3</sup>

Cells treated with latrunculin A maintained their altered state for extended periods (up to one week following treatment). Latrunculin B-induced changes appear to be more transient (effective anywhere from a few minutes to a few hours), even when cells were continually incubated with the compound.<sup>3</sup> (The authors of the study suggested that latrunculin B may have been inactivated by the serum in the growth media).

#### Solution Assays with Purified Actin<sup>2,5</sup>

Stock solutions of latrunculins were made to 2 to 10 mM in DMSO and diluted to 100  $\mu\text{M}$  in Buffer G (Buffer G: 5 mM Tris, pH 7.8, 2 mM  $\text{MgCl}_2$ , 0.1 mM  $\text{CaCl}_2$ , 0.2 mM ATP, 0.2 mM DTT, 0.01% to 0.1% sodium azide). Increases in fluorescence signal upon polymerization were monitored at room temperature using pyrenyl-actin (actin labeled on Cys374 with *N*-(1-pyrene)iodoacetamide (Molecular Probes, Catalog number P29)), using 0.7–0.95 moles of label per mole of protein according to the method of Kouyama and Mihashi.<sup>8</sup>

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## References

1. Science 219, 493 (1983); 2. FEBS Lett 213, 316 (1987); 3. Cell Motil Cytoskeleton 13, 127 (1989); 4. "On the Chemistry of Latrunculins A and B." Blasberger D et. al., Liebig's Ann Chem 1171 (1989); 5. J Biol Chem 275, 28120 (2000); 6. J Cell Sci 114, 1025 (2001); 7. J Nat Prod 67:1055 (2004); 8. Eur J Biochem 114, 33(1981).

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## Product List *Current prices may be obtained from our website or from our Customer Service Department.*

Cat #	Product Name	Unit Size
L12370	latrunculin A .....	100 µg
L22290	latrunculin B .....	100 µg

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