Latrunculins A and B

Quick Facts

Storage upon receipt:

- ≤–20˚C
- Desiccate

Absorption:

- 215 ± 3 nm (latrunculin A in methanol)
- 212 ± 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 affect on microtubular structure.[1-7] Latrunculin A inhibits binding of thymosin β_4 and nucleotide exchange on actin, but does not inhibit binding by profilin or DNase I.[5] Latrunculin A is more potent than latrunculin B, with both showing 10- to 100-fold greater potency than cytochalasins.[3,6]

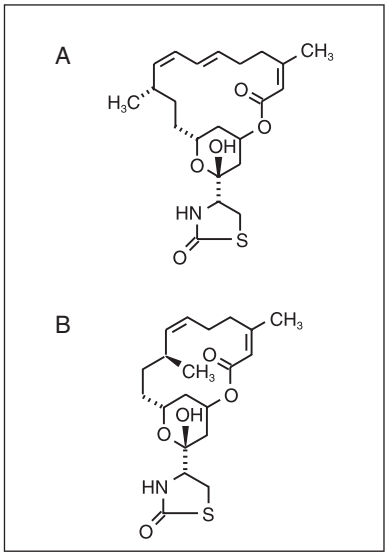

Figure 1. Structures of latrunculin A (top) and latrunculin B (bottom).

Contents

Latrunculins are provided as a lyophilized powder that is stable for 2 to 3 years when stored at ≤–20˚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 ≤–20˚C, desiccated, and protected from light. Stock solutions are stable for at least 2 to 3 months at ≤–20˚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.[2]

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 $CaCl_2$, 2 mM $MgCl_2$, 0.2 mM ATP, 0.2 mM DTT, 0.1% sodium azide at 25˚C);[2] latrunculin B has a K_d of ~200 nM.[6]

Latrunculin treatment caused complete rounding up of cells (mouse neuroblastoma and hamster fibroblasts) at 0.1–0.2 µg/mL (latrunculin A) and 0.5 µg/mL (latrunculin B) after 1 hour incubation. At 0.04–0.05 µg/mL of latrunculin A, most cells retained their normal shape, but some cells contracted and adopted aberrant morphologies.[3]

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.[3] (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[2,5]

Stock solutions of latrunculins were made to 2 to 10 mM in DMSO and diluted to 100 µM in Buffer G (Buffer G: 5 mM Tris, pH 7.8, 2 mM $MgCl_2$, 0.1 mM $CaCl_2$, 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.[8]

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., Liebigs 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).

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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