

Product Data Sheet

Product Name: Ac-Arg-Leu-Arg-AMC

Cat. No.: GA20483

Chemical Properties

Cas. No. 929903-87-7

Formula $C_{30}H_{46}N_{10}O_6$ M.Wt 642.76

Solubility Soluble in DMSO Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

Ac-Arg-Leu-Arg-AMC Assay for Proteasome Trypsin-like Activity^[1]

This protocol is adapted from research data and provided for reference only. Adjustments may be necessary based on specific experimental requirements.

1. Reagent Preparation: Dissolve Ac-Arg-Leu-Arg-AMC in an appropriate buffer or solvent to prepare a working concentration (e.g., 50µM); prepare 20mM Tris-HCl buffer (pH=7.5, containing 1mM DTT and 1mM EDTA).

Caution: Product has not been fully validated for medical applications. For research use only.

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2. Sample pretreatment: If using tissue or cell samples, first perform homogenization, centrifugation, and other steps to extract the proteasome, or directly use purified proteasome preparations.

3. Detection of proteasome trypsin-like activity: Add 50nM 20S proteasome, 50μM Ac-Arg-Leu-Arg-AMC substrate, and 20mM Tris-HCl buffer to the reaction system, with the total volume adjusted according to experimental needs (e.g., 100μL). Incubate the reaction mixture at 37°C and monitor the release of AMC (7-amino-4-methylcoumarin) using a fluorescence spectrophotometer. The excitation wavelength is approximately 380nm, and the emission wavelength is approximately 440-460nm. The initial reaction rate can be calculated from the change in fluorescence intensity over time to characterize the trypsin-like activity of the proteasome.

Precautions:

(1) For your safety and health, please wear a lab coat and disposable gloves during operation.

References:

[1] Kriachkov VA, Gotmanova NN, Tashlitsky VN, et al. Brain-Derived 11S Regulator (PA28αβ) Promotes Proteasomal Hydrolysis of Elongated Oligoglutamine-Containing Peptides. *Int J Mol Sci.* 2023 Aug 26;24(17):13275.

Background

Ac-Arg-Leu-Arg-AMC is a fluorescent peptide substrate (excitation/emission wavelength=380/440-460nm) used to detect the trypsin-like activity of the 26S proteasome. Ac-Arg-Leu-Arg-AMC can release fluorescent AMC through specific cleavage of the Arg-AMC bond by the β2 subunit of the 26S proteasome, thereby quantifying the trypsin-like activity of the proteasome. Ac-Arg-Leu-Arg-AMC can be used in studies on proteasome function, protein degradation regulation, and related diseases (such as cancer and neurodegenerative diseases)^[1-4].

References:

[1] Chang TL, Ding HY, Teng KN, et al. 5,6,3',4'-Tetrahydroxy-7-methoxyflavone as a novel potential proteasome inhibitor. *Planta Med.* 2010 Jul;76(10):987-94.
[2] Chang TL, Ding HY, Kao YW. Role of ginsenoside Rd in inhibiting 26S proteasome activity. *J Agric Food Chem.* 2008 Dec 24;56(24):12011-5.
[3] Chang TL. Inhibitory effect of flavonoids on 26S proteasome activity. *J Agric Food Chem.* 2009 Oct 28;57(20):9706-15.

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[4] Kulichkova VA, Artamonova TO, Lyublinskaya OG, et al. Proteomic analysis of affinity-purified extracellular proteasomes reveals exclusively 20S complexes. Oncotarget. 2017 Nov 1;8(60):102134-102149.

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