

Product Data Sheet

Product Name: H-Gln-AMC

Cat. No.: GA22334

Chemical Properties

Cas. No. 105888-45-7

Formula $C_{15}H_{17}N_3O_4$

M.Wt 303.32

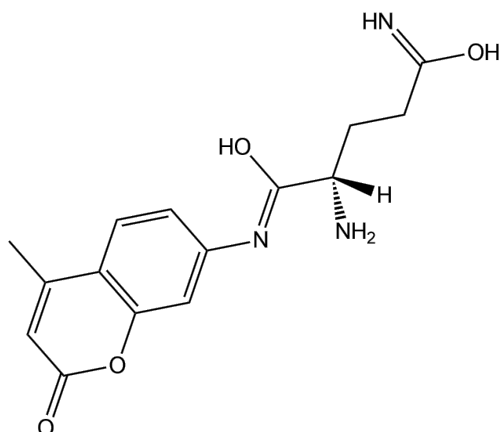
Solubility Soluble in DMSO

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

H-Gln-AMC used as the substrate for QC activity assays.

1. Prepare a 50mM Tris-HCl buffer with 150mM NaCl at pH 8.0.
2. Prepare H-Gln-AMC solutions with varying concentrations (e.g 50μM for bacterial QC catalytic activity testing) in the Tris-HCl buffer.
3. Add 0.5U of pyroglutaminy aminopeptidase to each well of a 96-well microtiter plate containing the H-Gln-AMC solutions.
4. Incubate the plate at 30°C for 10 minutes.
5. Add approximately 50nM of the QC enzyme to a final volume of 125μL reaction mixture to initiate the reaction.

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

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6. Monitor the fluorescence intensity at excitation/emission wavelengths of 380/460nm using the FluoStar Optima
7. Calculate QC activity from a standard curve of the fluorophore AMC generated under the same assay conditions

This protocol only provides a guideline, and should be modified according to your specific needs.

References:

[1] Taudte N, Linnert M, Rahfeld J, et al. Mammalian-like type II glutaminyl cyclases in *Porphyromonas gingivalis* and other oral pathogenic bacteria as targets for treatment of periodontitis. *J Biol Chem*. 2021 Jan-Jun;296:100263.

Background

H-Gln-AMC is a fluorogenic substrate commonly used to measure the activity of glutaminyl cyclase (QC) enzymes with K_m value of $51 \pm 3 \mu\text{M}$ at pH 8.0 and k_{cat} value of $5.4 \pm 0.1 \text{ s}^{-1}$ [1]. Glutaminyl cyclase (QC) catalyzes the intramolecular cyclization of N-terminal glutaminyl (Gln) and glutamyl (Glu) residues to form pyroglutamic (pGlu) peptides or proteins. Some recent findings suggest that QC can be a potential target against Alzheimer's disease, Huntington disease and other serious neurodegenerative disease[2].

H-Gln-AMC was used as a fluorescent substrate to detect glutaminyl cyclase (QC) activity in cerebrospinal fluid (CSF) from multiple sclerosis (MS) patients. In CSF, H-Gln-AMC was catalyzed by QC to form pyroglutamyl-AMC, which was subsequently hydrolyzed by pyroglutamyl aminopeptidase to release the fluorescent product AMC. The results show a slight increase in QC activity observed in MS patients, although the difference was not significant[3]. H-Gln-AMC was used as a fluorescent substrate to measure the activity of glutaminyl cyclases (QCs) from *Porphyromonas gingivalis* (*PgQC*), *Tannerella forsythia* (*TfQC*), and *Prevotella intermedia* (*PiQC*). At a concentration of $50 \mu\text{M}$ H-Gln-AMC, the catalytic activity of *PgQC*, *TfQC*, and *PiQC* could be accurately determined based on changes in AMC fluorescence intensity[4].

References:

- [1] Schilling S, Hoffmann T, Rosche F, et al. Heterologous expression and characterization of human glutaminyl cyclase: evidence for a disulfide bond with importance for catalytic activity. *Biochemistry*. 2002 Sep 3;41(35):10849-57.
- [2] Szaszko M, Hajdú I, Flachner B, et al. Identification of potential glutaminyl cyclase inhibitors from

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lead-like libraries by in silico and in vitro fragment-based screening. Mol Divers. 2017.21:175–186

[3] Gontsarova A, Kaufmann E, Tumani H, et al. Glutaminyl cyclase activity is a characteristic feature of human cerebrospinal fluid. Clin Chim Acta. 2008 Mar;389(1-2):152-9.

[4] Taudte N, Linnert M, Rahfeld J, et al. Mammalian-like type II glutaminyl cyclases in Porphyromonas gingivalis and other oral pathogenic bacteria as targets for treatment of periodontitis. J Biol Chem. 2021 Jan-Jun;296:100263.

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