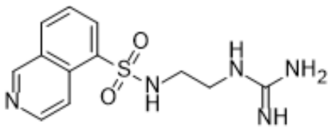
# HA-1004

| | |
|---|---|
| **Cat. No.:** | HY-123468 |
| **CAS No.:** | 91742-10-8 |
| **Molecular Formula:** | $C_{12}H_{15}N_5O_2S$ |
| **Molecular Weight:** | 293.34 |
| **Target:** | Cyclic GMP-AMP Synthase; PKA; ERK; Calcium Channel |
| **Pathway:** | Immunology/Inflammation; Stem Cell/Wnt; TGF-beta/Smad; MAPK/ERK Pathway; Membrane Transporter/Ion Channel; Neuronal Signaling |
| **Storage:** | Powder -20°C 3 years<br>In solvent -80°C 6 months<br>-20°C 1 month |



## BIOLOGICAL ACTIVITY

| | |
|---|---|
| **Description** | HA-1004 is a selective inhibitor of PKA, which can inhibit lipolysis and induce vascular relaxation. HA-1004 is also a dual inhibitor of cyclic GMP-dependent protein kinase and cyclic AMP-dependent protein, and is involved in smooth muscle, second messenger, cyclic AMP and cyclic GMP regulation mechanisms. HA-1004 is an antagonist for calcium, that can be used as a vasodilator to inhibit the contraction of rabbit aortic strips, or to antagonize ERK and tyrosine hydroxylase (TH) phosphorylation in morphine abstinence rat models[1][2][3]. |
| **$IC_{50}$ & Target** | cyclic GMP-dependent protein kinase, cyclic AMP-dependent protein[2] |
| **In Vivo** | HA-1004 (40 nmol/day; infused by minipumps and delivered at 1 μL/h), it acts simultaneously with morphine to antagonize the phosphorylation of ERK1/2 and TH and inhibit the increase of NA conversion during morphine withdrawal in rats[1].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |

## REFERENCES

[1]. Almela P, et al. Crosstalk between G protein-coupled receptors (GPCRs) and tyrosine kinase receptor (TXR) in the heart after morphine withdrawal. Front Pharmacol. 2013 Dec 27;4:164.

[2]. Goodman HM, et al. The isoquinoline sulfonamide inhibitors of protein phosphorylation, H-7, H-8, and HA-1004, also inhibit RNA synthesis: studies on responses of adipose tissue to growth hormone. Endocrinology. 1990 Jan;126(1):441-50.

[3]. Ishikawa T, et al. Relaxation of vascular smooth muscle by HA-1004, an inhibitor of cyclic nucleotide-dependent protein kinase. J Pharmacol Exp Ther. 1985 Nov;235(2):495-9.



Tel: 609-228-6898 Fax: 609-228-5909 E-mail: tech@MedChemExpress.com
Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA