PACAP (1-38), human, ovine, rat

Cat. No.:	HY-P0221
CAS No.:	137061-48-4
Molecular Formula:	$C_{203}H_{331}N_{63}O_{53}S$
Molecular Weight:	4534.26
Sequence:	His-Ser-Asp-Gly-Ile-Phe-Thr-Asp-Ser-Tyr-Ser-Arg-Tyr-Arg-Lys-Gln-Met-Ala-Val-Lys-Lys-Tyr-Leu-Ala-Ala-Val-Leu-Gly-Lys-Arg-Tyr-Lys-Gln-Arg-Val-Lys-Asn-Lys-NH2
Sequence Shortening:	HSDGIFTDSYSRYRKQMAVKKYLAAVLGKRYKQRVKNK-NH2
Target:	PACAP Receptor
Pathway:	GPCR/G Protein
Storage:	Sealed storage, away from moisture Powder -80°C 2 years -20°C 1 year * In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)

HSDGIFTDSYSRYRKQMAVKKYLAAVLGKRYKQRVKNK-NH_2

SOLVENT & SOLUBILITY

In Vitro

H_2O : 100 mg/mL (22.05 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	0.2205 mL	1.1027 mL	2.2054 mL
	5 mM	0.0441 mL	0.2205 mL	0.4411 mL
	10 mM	0.0221 mL	0.1103 mL	0.2205 mL

Please refer to the solubility information to select the appropriate solvent.

BIOLOGICAL ACTIVITY

Description

PACAP (1-38), human, ovine, rat is a neuropeptide with 38 amino acid residues. PACAP (1-38) binds to PACAP type I receptor, PACAP type II receptor VIP_1, and PACAP type II receptor VIP_2 with IC_{50}s of 4 nM, 2 nM, and 1 nM, respectively.

IC_{50} & Target

IC50: 4 nM (PACAP type I receptor), 2 nM (PACAP type II receptor VIP_1), and 1 nM (PACAP type II receptor VIP_2)[1]

In Vitro

PACAP (1-38), human, ovine, rat is a fragment of pituitary adenylate cyclase activating polypeptide[1].

PACAP (1-38) shows high affinity for PACAP specific (PAC1) receptor in membranes from various tissues including the endocrine pancreas[2].

In vitro, PACAP (1-38) relaxes guinea-pig and rabbit tracheal smooth muscle precontracted by histamine and by acetylcholine. PACAP (1-38) also increases adenosine 3':5'-cyclic monophosphate (cyclic AMP) in tracheal smooth muscle, providing a possible mechanism for the relaxant effect of PACAP (1-38)[3].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

In Vivo	PACAP (1-38) alone in sham animals does not result in changes in any of the retinal layers. PACAP (1-38) dissolved in solutio ophthalmica cum benzalkonio leads to significant protection in the retina in bilateral common carotid artery occlusion (BCCAO)-lesioned retinas; retinas treated with PACAP (1-38) eye drops have preserved structure compared to control retinas. OLM-ILM (outer limiting membrane-inner limiting membrane) distance is reduced by 49.7% ($p<0.001$) in BCCAO retinas compared to sham controls, but it is only 40.6% ($p<0.001$) in the eyes treated with PACAP (1-38) eye drops. A protection to a similar degree is found in the inner nuclear layer (INL) (BCCAO: 38.5%, PACAP (1-38): 30.5%; $p<0.001$), and inner plexiform layer (IPL) (BCCAO: 64.8%, PACAP (1-38): 38.2%; $p<0.05$), while no statistically significant attenuation of the damage is observed in the outer nuclear layer (ONL) (BCCAO: 36.5%, PACAP (1-38): 37.7%) or outer plexiform layer (OPL) (BCCAO: 53.0%, PACAP (1-38): 48.2%). The number of cells in the ganglion cell layer (GCL) is significantly decreased after BCCAO by 52.4% ($p<0.05$) and is significantly ameliorated by PACAP (1-38) eye drops (decreased by 25.9%; $p<0.05$)[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Animal Administration [4]	Rats[4] Wistar rats (n=20:n=12 for histological analysis, n=8 for immunohistochemical analysis) weighing 250-300 are fed and watered ad libitum, under light/dark cycles of 12/12 h. Directly after the operation within 1 min, the right eye is treated with PACAP (1-38) eye drops (1 µg/drop). The vehicle used is benzalkonium-chloride in a concentration of 0.005%, as it is the most effective vehicle to achieve neuroprotection with PACAP1-27 eye drops. The left eye serves as a control, treated only with the vehicle. A group of animals serve as the sham-operated group that undergo anesthesia and all steps of the surgical procedure except ligation of the carotid arteries. Rats are treated twice a day with one drop, for 5 consecutive days[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- J Nanobiotechnology. 2023 Aug 8;21(1):261.
- J Cell Mol Med. 2023 Oct 13.
- Research Square Preprint. 2023 Apr 19.

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REFERENCES

[1]. Gourlet P, et al. Fragments of pituitary adenylate cyclase activating polypeptide discriminate between type I and II recombinant receptors. Eur J Pharmacol. 1995 Dec 4;287(1):7-11.

[2]. Yamaguchi N. Pituitary adenylate cyclase activating polypeptide enhances glucose-evoked insulin secretion in the canine pancreas in vivo. JOP. 2001 Sep;2(5):306-16.

[3]. Lindén A, et al. Inhibition of bronchoconstriction by pituitary adenylate cyclase activating polypeptide (PACAP 1-27) in guinea-pigs in vivo. Br J Pharmacol. 1995 Jul;115(6):913-6.

[4]. Werling D, et al. Passage through the Ocular Barriers and Beneficial Effects in Retinal Ischemia of Topical Application of PACAP (1-38) in Rodents. Int J Mol Sci. 2017 Mar 21;18(3). pii: E675.

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

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