CALCITONIN GENE-RELATED PEPTIDES

BACHEM

PIONEERING PARTNER FOR PEPTIDES
Calcitonin gene-related peptide (CGRP) is a 37 amino acid peptide which belongs to a family of related peptides including calcitonin, amylin, and adrenomedullin. CGRP peptides are mainly localized in sensory and central neurons and have been implicated in a variety of physiological processes such as cardiovascular homeostasis, calcium metabolism, and control of fetoplacental vascular tone. In this brochure we present a selection of our products for CGRP research.

**Introduction**

α-CGRP and β-CGRP, also known as CGRP I and II, respectively, belong to the calcitonin family of peptides comprising such members as calcitonin, amylin, calcitonin receptor-stimulating peptide, adrenomedullin 1, and intermedin. The N-terminally truncated analog of intermedin-53 is also known as adrenomedullin 2. At their N-terminus, these peptides have in common a characteristic disulfide loop structure, generally formed by six to seven amino acids. The 37 amino acid peptides α-CGRP and β-CGRP are encoded by different genes on chromosome 11. α-CGRP mRNAs are derived from the calcitonin/CGRP gene by alternative tissue specific splicing of the primary RNA transcripts whereas β-CGRP is encoded by a separate gene with high homology to the calcitonin/CGRP gene. The amino acid sequences of CGRP peptides are well conserved among species, as illustrated in Scheme 1. In humans, α- and β-CGRP differ by three amino acids, in rats, by two amino acids. Both peptides show similar biological activity. In dogs, pigs and numerous other species, variants of the CGRP-like calcitonin receptor-stimulating peptide (CRSP) are expressed in place of β-CGRP. The peptides are similar in their biological activities.

**Scheme 1:** Amino acid sequences of various CGRP peptides. Positions with high variance as well as amino acids, which differ from the majority of sequences, are highlighted. High variance was arbitrarily assigned to positions, where the major amino acid is present in less than 70% of all sequences.

<table>
<thead>
<tr>
<th>Peptide</th>
<th>Sequence</th>
<th>Amino acid Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>α-CGRP (human)</td>
<td>ACDTATCVTHRLAGLLSRSGGVKNNFVPTNVGSKAF-NH₂</td>
<td></td>
</tr>
<tr>
<td>β-CGRP (human)</td>
<td>ACNTATCVTHRLAGLLSRSGGPVKSNFVPTNVGSKAF-NH₂</td>
<td></td>
</tr>
<tr>
<td>α-CGRP (rat)</td>
<td>SCNTATCVTHRLAGLLSRSGGVKDNFVPTNVGSSEAF-NH₂</td>
<td></td>
</tr>
<tr>
<td>β-CGRP (rat)</td>
<td>SCNTATCVTHRLAGLLRSIGNGVKDNFVPTNVGSKAF-NH₂</td>
<td></td>
</tr>
<tr>
<td>α-CGRP (mouse)</td>
<td>SCNTATCVTHRLAGLLSRSGGVKDNFVPTDVGSEAF-NH₂</td>
<td></td>
</tr>
<tr>
<td>β-CGRP (mouse)</td>
<td>SCNTATCVTHRLAGLLRSIGNGVKDNFVPTDVGSEAF-NH₂</td>
<td></td>
</tr>
<tr>
<td>α-CGRP (dog)</td>
<td>SCNTATCVTHRLAGLLSRSGGVKNNFVPTNVGSSEAF-NH₂</td>
<td></td>
</tr>
<tr>
<td>β-CGRP (dog)</td>
<td>SCNTATCVTHRLAGLLRSIGNGVKDNFVPTDVGSEAF-NH₂</td>
<td></td>
</tr>
<tr>
<td>α-CGRP (pig)</td>
<td>SCNTATCVTHRLAGLLSRSGGVKNNFVPTDVGSEAF-NH₂</td>
<td></td>
</tr>
<tr>
<td>β-CGRP (pig)</td>
<td>SCNTATCVTHRLAGLLRSIGNGVKDNFVPTDVGSEAF-NH₂</td>
<td></td>
</tr>
<tr>
<td>α-CGRP (porcine)</td>
<td>SCNTATCVTHRLAGLLSRSGGVKNNFVPTNVGSSEAF-NH₂</td>
<td></td>
</tr>
<tr>
<td>β-CGRP (porcine)</td>
<td>SCNTATCVTHRLAGLLRSIGNGVKDNFVPTDVGSEAF-NH₂</td>
<td></td>
</tr>
<tr>
<td>α-CGRP (sheep)</td>
<td>SCNTATCVTHRLAGLLSRSGGVKNNFVPTNVGSSEAF-NH₂</td>
<td></td>
</tr>
<tr>
<td>β-CGRP (sheep)</td>
<td>SCNTATCVTHRLAGLLRSIGNGVKDNFVPTDVGSEAF-NH₂</td>
<td></td>
</tr>
<tr>
<td>α-CGRP (chicken)</td>
<td>SCNTATCVTHRLAGLLSRSGGVKNNFVPTNVGSSEAF-NH₂</td>
<td></td>
</tr>
<tr>
<td>β-CGRP (chicken)</td>
<td>SCNTATCVTHRLAGLLRSIGNGVKDNFVPTDVGSEAF-NH₂</td>
<td></td>
</tr>
</tbody>
</table>

**Distribution of CGRP**

CGRP expression is widely distributed in the central and peripheral nervous system. In the brain, it is particularly concentrated in the hypothalamus and in certain nuclei of the brainstem. In the periphery, CGRP is mainly detected in sensory afferents projecting to the spinal cord, in motor neurons at the neuromuscular junctions and in nerve fibers associated with the vasculature. In capsaicin-sensitive sensory neurons, CGRP co-localizes with substance P and other
neuropeptides, in the motor endplate with acetylcholine.

**Physiological Functions**

On the basis of pharmacological studies several physiological functions of CGRP have been suggested. Due to its potent vasodilatory action and its inotropic and chronotropic effects, CGRP is likely to play a role in cardiovascular homeostasis. Furthermore, it influences feeding and digestion since it has been shown to decrease food intake, gastric secretion, and intestinal motility. Based on its ability to modulate substance P signaling, an additional function of CGRP in nociception has been proposed. Additionally, CGRP might be important in processes such as control of fetoplacental vascular tone, regulation of calcium metabolism and insulin secretion, acetylcholine receptor synthesis, peripheral nerve regeneration, and neurogenic inflammation.

**CGRP Receptors**

CGRP receptors have been identified in several tissues, including brain, cardiovascular, endothelial, and smooth muscle tissue. Based on early pharmacological studies, the existence of two classes, CGRP1 and CGRP2 receptors, has been described. According to this historical classification CGRP1 receptors are more sensitive to the antagonistic properties of α-CGRP (8-37) (4013696, 4034544) whereas CGRP2 receptors are more responsive to the agonistic CGRP analogs, \((\text{Cys(Acm)}^{2,7}-\alpha\text{-CGRP (human)} (4039880)\) and \((\text{Cys(Et)}^{2,7}-\alpha\text{-CGRP (human)} (4039888). Recent studies have shown that the previously cloned G protein-coupled orphan receptor, named calcitonin receptor-like receptor (CRLR), can interact with members of a new family of three single-transmembrane domain receptor activity-modifying proteins (RAMPs). Interaction with RAMP1 resulted in a CGRP receptor, which is sensitive to α-CGRP (8-37), whereas binding to RAMP2 and RAMP3 led to receptors for adrenomedullin known as AM1 and AM2 receptors, respectively. The AM2 receptor showed considerable affinity for CGRP. Besides their essential role in regulating ligand specificity, RAMPs are also required for membrane trafficking of CRLR. Recently, a receptor component protein (RCP) of the CRLR/RAMP1 complex was described. RCP is an intracellular protein which is highly conserved between species and might be required for G protein-coupled signal transduction.

**Therapeutic Implications**

Given the multitude of physiological and pathophysiological effects of CGRP, modulations of its properties represent potential therapeutic interventions in a variety of disease states including cardiovascular disorders and neurogenic inflammation. Clinical trials have indicated that the vasodilatory effect of CGRP might be beneficial in the treatment or prevention of Raynaud’s disease, hypertension, angina pectoris and heart failure. Since CGRP is rapidly metabolized, longer acting CGRP agonists are needed for long-term treatment. CGRP antagonists, for their part, have found use in the treatment of migraine, which involves the activation of the trigeminal system and CGRP-evoked dilatation of cranial vessels.

**CGRP as Cardioprotectant**

CGRP is also present in the heart. Infusion of the peptide induces vasodilation and
CGRP generates positive inotropic and chronotropic effects, which can be blocked by its antagonist, truncated CGRP 8-37. In case of myocardial ischemia, CGRP is released by cardiac adrenergic cells. In response, an increase of plasma CGRP can be detected. The peptide is involved in protecting the heart against ischemia-reperfusion injury. Unfortunately, the short half-life of CGRP limits its therapeutic use in the treatment of cardiovascular disorders, so long-acting CGRP agonists have gained interest. They also show potential in the management of hypertension. Stabilization of peptidic agonists could be achieved by conjugation of long-chain fatty acids. N-terminally lipidated α-CGRP analogs have been developed and tested in murine models of hypertension and heart failure. Long-time administration of such an analog in vivo eventually resulted in a reduction in food intake and body weight. The modified peptide hormone induced secretion of GLP-1.

As an alternative approach for tackling the low metabolic stability of the peptide, controlled-release formulations of α-CGRP for treatment of ischemia due to a myocardial infarction have been developed.

CGRP and Migraine
CGRP has been detected in pericranial vascular nerves and the trigeminal ganglion. The neuropeptide is a potent dilator of cerebral and dural vessels, and it is involved in meningeal dural vasodilation. Migraine is possibly caused by activation of the human trigeminal system and the release of CGRP. Increased cranial CGRP levels have been measured in patients suffering from episodic or chronic migraine. Infusion of the peptide can trigger migraine attacks. Hence, CGRP antagonists could be effective in the treatment of the disease, which afflicts about 15 to 18% of the population worldwide. The recurrent pulsating strong headache and other symptoms turn migraine into a leading cause of disability and a global health problem. Women carry a higher risk of developing the disease than men. A number of small-molecule CGRP receptor antagonists have been evaluated as antimigraine drugs. Clinical studies with the dipeptide mimic olcegepant (BIBN-4096 BS) gave promising results, but the development was discontinued due to low oral bioavailability, rapid clearance and poor physical properties of the compound. Good results were obtained with the D-lysine lactame derivative telcagepant (MK-0974), an antagonist with improved oral bioavailability, in clinical phase III. Its development was discontinued in 2011 due to liver toxicity. More recently, clinical trials have been conducted with atogepant (MK-8031, AGN 241689) (phase II/III), ubrogepant (MK-1602) and rimegepant (BMS-927711) (both phase III, treatment of acute migraine).

As an alternative to CGRP receptor antagonists, anti-CGRP antibodies have been developed for the management of both episodic and chronic migraine and cluster headache. In 2018 three of them, erenumab (AMG-334), fremanezumab (TEV-48125), and galcanezumab (LY2951742), gained FDA approval for the prevention of migraine attacks. Erenumab was approved as well by the European authorities. A further antibody awaiting approval, eptinezumab (ALD403), is still evaluated in clinical studies. Fremanezumab and galcanezumab bind to α- and β-CGRP with about the same affinity. The situation for eptinezumab is not yet clear. Erenumab targets the CGRP receptor instead of the ligand.

Application of such antibodies could be contraindicated in case of cerebral and cardiovascular ischemia, which are alleviated by endogenous CGRP due to its cardioprotective activity. In the worst case, CGRP blockade could transform a transient mild ischemic event into a full-blown infarct. Moreover, administration of CGRP antagonists could mitigate other forms of chronic pain such as the joint pain and inflammation afflicting patients suffering from knee arthritis.

Prospects
CGRP has proven to be a molecule which is involved in diverse physiological processes. Future research will contribute to a better understanding of its various properties, the heterogeneity of its receptors, and its physiological interactions with other molecules.
Developing heart cell, fluorescent light micrograph. Fluorescent dyes have been used to highlight cellular structures and proteins: actin (green), cell nucleus (white), calcium channel protein synthesis (red). Actin is a contractile muscle protein. Calcium channels are vital to the proper functioning of a muscle cell, and here is being investigated with calcitonin gene related peptide (CGRP).

KEYSTONE/R. BICK, B. POINDEXTER, UT MEDICAL SCHOOL
REFERENCES

T. Katafuchi et al.
Calcitonin receptor-stimulating peptide, a new member of the calcitonin gene-related peptide family. Its isolation from porcine brain, structure, tissue distribution, and biological activity.

P.L. Durham and C. V. Vause
Calcitonin gene-related peptide (CGRP) receptor antagonists in the treatment of migraine.
CNS Drugs 24, 539-548 (2010)

L.H. Wang et al.
Serum levels of calcitonin gene-related peptide and substance P are decreased in patients with diabetes mellitus and coronary artery disease.

M.E. Bigal et al.
Calcitonin gene-related peptide (CGRP) and migraine current understanding and state of development.
Headache 53, 1230-1244 (2013)

F.A. Russell et al.
Calcitonin gene-related peptide: physiology and pathophysiology.
Physiol. Rev. 94, 1099-1142 (2014)

S. Guo et al.
Premonitory and nonheadache symptoms induced by CGRP and PACAP38 in patients with migraine.
Pain 157, 2773-2781 (2016)

A. Maassen van den Brink et al.
Wiping out CGRP: Potential cardiovascular risks.

Y. Zhang et al.
Calcitonin gene-related peptide is a key factor in the homing of transplanted human MSCs to sites of spinal cord injury.

W.S. Schou et al.
Calcitonin gene-related peptide and pain: a systematic review.
J. Headache Pain 18, 34 (2017)

A.A. Abdool et al.
A novel alpha-calcitonin gene-related peptide analogue protects against end-organ damage in experimental hypertension, cardiac hypertrophy, and heart failure.

M. Deen et al.
Blocking CGRP in migraine patients - a review of pros and cons.
J. Headache Pain 18, 96 (2017)

M.A. Giamberardino et al.
Calcitonin gene-related peptide receptor as a novel target for the management of people with episodic migraine: current evidence and safety profile of erenumab.
J. Pain Res. 10, 2751-2760 (2017)

D. Monteith et al.
Safety, tolerability, pharmacokinetics, and pharmacodynamics of the CGRP binding monoclonal antibody LY2951742 (galcanezumab) in healthy volunteers.
Front. Pharmacol. 8, 740 (2017)

J.B. Pawlak et al.
Cardiovascular effects of exogenous adrenomedullin and CGRP in Ramp and Calcrl deficient mice.
Peptides 88, 1-7 (2017)

L. Pellesi et al.
Spotlight on anti-CGRP monoclonal antibodies in migraine: The clinical evidence to date.

W.S. Schou et al.
Calcitonin gene-related peptide and pain: a systematic review.
J. Headache Pain 18, 34 (2017)

F. Tullio et al.
Cardioprotective effects of calcitonin gene-related peptide in isolated rat heart and in H9c2 cells via redox signaling.

R.E. Yarwood et al.
Endosomal signaling of the receptor for calcitonin gene-related peptide mediates pain transmission.

C. Depre et al.
A randomized, double-blind, placebo-controlled study to evaluate the effect of erenumab on exercise time during a treadmill test in patients with stable angina.
Headache 58, 715-723 (2018)

Z. Guo et al.
Independent roles of CGRP in cardioprotection and hemodynamic regulation in ischemic postconditioning.

D.L. Hay et al.
Update on the pharmacology of calcitonin/CGRP family of peptides: IUPHAR Review 25.
Br. J. Pharmacol. 175, 3-17 (2018)

Z. Kee et al.
The role of calcitonin gene related peptide (CGRP) in neurogenic vasodilation and its cardioprotective effects.
Front. Physiol. 9, 1249 (2018)

L. Ohlsson et al.
Fremanezumab blocks CGRP induced dilatation in human cerebral, middle meningeal and abdominal arteries.
J. Headache Pain 19, 66 (2018)

A.M. Roehrkasse et al.
Structure-function analyses reveal a triple beta-turn receptor-bound conformation of adrenomedullin 2/intermedin and enable peptide antagonist design.
J. Biol. Chem. 293, 15840-15854 (2018)
CALCITONIN GENE RELATED PEPTIDES (CGRP)

For more detailed information please go to shop.bachem.com
<table>
<thead>
<tr>
<th>Peptide Type</th>
<th>Sequence Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGRP (chicken)</td>
<td>H-3352 ACNTATCVTHRLADFLSRGGVVKNNFVPTNVGSKAF-NH₂ (Disulfide bond)</td>
</tr>
<tr>
<td>α-CGRP (human)</td>
<td>H-1470 ACDTATCVTHRLAGGLSRGGVVKNNFVPTNVGSKAF-NH₂ (Disulfide bond)</td>
</tr>
<tr>
<td>Biotinyl-α-CGRP (human)</td>
<td>H-5688 Biotinyl-ACDTATCVTHRLAGGLSRGGVVKNNFVPTNVGSKAF-NH₂ (Disulfide bond)</td>
</tr>
<tr>
<td>(Cys(Acm)²⁻)⁻α-CGRP (human)</td>
<td>H-5766 AC(Acm)DTATC(Acm)VTHRLAGGLSRGGVVKNNFVPTNVGSKAF-NH₂</td>
</tr>
<tr>
<td>(Cys(Et)²⁻)⁻α-CGRP (human)</td>
<td>H-5784 AC(Et)DTATC(Et)VTHRLAGGLSRGGVVKNNFVPTNVGSKAF-NH₂</td>
</tr>
<tr>
<td>Tyr-α-CGRP (human)</td>
<td>H-3354 YACDTATCVTHRLAGGLSRGGVVKNNFVPTNVGSKAF-NH₂ (Disulfide bond)</td>
</tr>
<tr>
<td>α-CGRP (mouse, rat)</td>
<td>H-2265 SCNTATCVTHRLAGGLSRGGVVKDNFVPTNVGSEAF-NH₂ (Disulfide bond)</td>
</tr>
<tr>
<td>Biotinyl-α-CGRP (mouse, rat)</td>
<td>H-5684 Biotinyl-SCNTATCVTHRLAGGLSRGGVVKDNFVPTNVGSEAF-NH₂ (Disulfide bond)</td>
</tr>
<tr>
<td>α-CGRP (8-37) (human)</td>
<td>H-9895 VTHRLAGGLSRGGVVKNNFVPTNVGSKAF-NH₂</td>
</tr>
<tr>
<td>α-CGRP (8-37) (mouse, rat)</td>
<td>H-4924 VTHRLAGGLSRGGVVKDNFVPTNVG-SEAF-NH₂</td>
</tr>
<tr>
<td>α-CGRP (19-37) (human)</td>
<td>H-8885 SGGVVKNNFVPTNVGSKAF-NH₂</td>
</tr>
<tr>
<td>α-CGRP (23-37) (human)</td>
<td>H-8895 VKNNFVPTNVGSKAF-NH₂</td>
</tr>
<tr>
<td>Tyr-α-CGRP (23-37) (mouse, rat)</td>
<td>H-2270 YVKDNFVPTNVGSEAF-NH₂</td>
</tr>
<tr>
<td>(Tyr²⁻)⁻α-CGRP(27-37) (canine, mouse, rat)</td>
<td>H-5504 YVPNVGSEAF-NH₂</td>
</tr>
<tr>
<td>α-CGRP (29-37) (canine, mouse, rat)</td>
<td>H-5746 PTVNVGSEAF-NH₂</td>
</tr>
<tr>
<td>β-CGRP (human)</td>
<td>H-6730 ACNTATCVTHRLAGGLSRGGVMVKSNFVPTNVGSEAF-NH₂ (Disulfide bond)</td>
</tr>
</tbody>
</table>
RELATED PRODUCTS

For more detailed information please go to shop.bachem.com
Calcitonin (chicken)
H-3074
CASLSTCVLGKLSQELHKLQTYPRTD-VGAGTP-NH₂
(Disulfide bond)

Calcitonin (eel)
H-2255
CSNLSTCVLGKLSQELHKLQTYPRTD-VGAGTP-NH₂
(Disulfide bond)

(Des-Cys¹,cyclo(Ser²-Asu⁷))-Calcitonin (eel) acetate salt
H-2214
c(SNLST-Asu)VLGKLSQELHKLQTYPRTD-VGAGTP-NH₂

Calcitonin (human)
H-2250
CGNLSTCMLGTYTQDFNKFHTF-PQTAIGVGAP-NH₂
(Disulfide bond)

Biotinyl-(Cys¹,Lys(biotinyl)¹⁸)-Calcitonin (human)
H-6670
Biotinyl-CGNLSTCMLGTYTQDFNK(biotinyl)FHTFPQTAIGVGAP-NH₂
(Disulfide bond)

Calcitonin (porcine)
H-3068
CSNLSTCVLSAYWRNLNNFHRFSGMGF-GPETP-NH₂
(Disulfide bond)

Calcitonin (rat)
H-3072
CGNLSTCMLGTYTQDNLNFHTFPQTF-SIGVGAP-NH₂
(Disulfide bond)

Calcitonin (salmon I)
H-2260
CSNLSTCVLGKLSQELHKLQTYPRNTGS-GTP-NH₂
(Disulfide bond)

Biotinyl-Calcitonin (salmon I)
H-5668
Biotinyl-CSNLSTCVLGKLSQELHKLQTY-PRNTGS-GTP-NH₂
(Disulfide bond)

Calcitonin (8-32) (salmon I)
H-5502
VLGKLSQELHKLQTYPRNTGS-GTP-NH₂

Acetyl-(Asn¹⁰,Tyr¹²)-Calcitonin (8-32) (salmon I)
H-4922
Ac-VLGKLSQELHKLQTYPRNTGSNTY-NH₂

Calcitonin C-Terminal Flanking Peptide (human)
H-2050
DMSSDLERDHRPHVSMPQAN

Calcitonin C-Terminal Flanking Peptide (human)
H-8236
DMSSDLERDHRPHVSMPQAN

Calcitonin N-Terminal Flanking Peptide (human)
H-3076
APFRSALESSPADPATLSDEEARLL-LAALVQDYVQMKESELESEQREGSSLDSPRS
<table>
<thead>
<tr>
<th>Peptide Name</th>
<th>Sequence</th>
<th>Disulfide Bond</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrenomedullin (human)</td>
<td>YRQSMNNFQGLRSFGCRFGTCT-VQKLH0IQYFTDKDKDNVAPRSKISPQGY-NH₂</td>
<td></td>
</tr>
<tr>
<td>Adrenomedullin (rat)</td>
<td>YRQSMNNQGSRSTGCRFGTCTMQKLH0IQYFTDKDKGMAPRNKISPQGY-NH₂</td>
<td></td>
</tr>
<tr>
<td>Adrenomedullin (11-50) (rat)</td>
<td>STGCRFGTCTMQKLH0IQYFTDKDKDGMAPRNKISPQGY-NH₂</td>
<td></td>
</tr>
<tr>
<td>Adrenomedullin (13-52) (human)</td>
<td>SFQCRFGTCTVQKLH0IQYFTDKDKDNVAPRSKISPQGY-NH₂</td>
<td></td>
</tr>
<tr>
<td>Adrenomedullin (16-31) (human, pig)</td>
<td>CRFGTCTVQKLH0IQY-NH₂</td>
<td></td>
</tr>
<tr>
<td>Adrenomedullin (22-52) (human)</td>
<td>TVQKLH0IQYFTDKDKDNVAPRSKISPQGY-NH₂</td>
<td></td>
</tr>
<tr>
<td>Adrenomedullin (26-52) (human)</td>
<td>LAH0IQYFTDKDKDNVAPRSKISPQGY-NH₂</td>
<td></td>
</tr>
<tr>
<td>Adrenomedullin (porcine)</td>
<td>YRQSMNNFQGLRSFGCRFGTCT-VQKLH0IQYFTDKDKGVAPRSKISPQGY-NH₂</td>
<td></td>
</tr>
<tr>
<td>Adrenomedullin 5 (primate)</td>
<td>HQVPQHRGHVCYLGVCRTHRLEIIQWIR-SASTKEPTGKASREPQNPYSY-NH₂</td>
<td></td>
</tr>
<tr>
<td>Intermedin (human)</td>
<td>TQAQLRLVGCVLGTCQVQNLSHRL-WQLMGAPQRQDSAPVDPPSPHSY-NH₂</td>
<td></td>
</tr>
<tr>
<td>Intermedin (rat)</td>
<td>PHAQQLRLVGCVLGTCQVQNLSHRL-WQLVRPSGRRDSAPVDPPSPHSY-NH₂</td>
<td></td>
</tr>
<tr>
<td>Intermedin-53 (human)</td>
<td>HSGPRRTQAQLRLVGCVLGTC-QVQNLSHRLWQLMGAPQRQDSAPVDPPSPHSY-NH₂</td>
<td></td>
</tr>
<tr>
<td>Proadrenomedullin (1-20) (human)</td>
<td>ARLDVASEFRKKWNKWALSR-NH₂</td>
<td></td>
</tr>
<tr>
<td>Proadrenomedullin (1-20) (rat)</td>
<td>ARLDTSSQFRKKWNKWALSR</td>
<td></td>
</tr>
<tr>
<td>Proadrenomedullin (12-20) (human)</td>
<td>KWNKWALSR-NH₂</td>
<td></td>
</tr>
</tbody>
</table>