Endothelins (ET-1,2,3) and Urotensin II are peptides that are considered to be very powerful vasoconstrictive substances. In humans, endothelins mediate their actions via two specific G-Protein coupled receptors, ET$_A$R and ET$_B$R. Both ET$_A$R and ET$_B$R are present in the heart and in human myocardium at similar levels.¹ ²

Until recently it was thought that all cellular activities of the endothelins were mediated through their interactions with their cell surface receptors. However, a recent study demonstrated that cardiac nuclei also possess both ET$_A$R and ET$_B$R subtypes, which are functional and coupled to signaling mechanisms within the nuclear membrane.²  While ET$_B$R has varying affinities for the endothelin isoforms (ET-1>ET-2>ET-3), ET$_B$R shows no selective affinity.² ³ Subsequent studies have demonstrated the presence of endothelins in vascular as well as in non-vascular cells and tissues, having multiple biological activities.

The human Urotensin II receptor (UTIIR) was originally isolated as an orphan receptor (GPR14) in neural and sensory tissues. Urotensin II is expressed in various human tissues such as CNS, skeletal muscle, pancreas, and heart.² ⁴ ⁶ The role and the importance of ET-1 and Urotensin II as cardiovascular peptides in humans are already well established.² ⁴

Recently, evidence has accumulated indicating that ET-1, Urotensin II and their receptors are expressed in various kinds of tumor cells. Urotensin II was reported to stimulate cell growth of adrenal tumors and neuroblastomas suggesting the possibility that Urotensin II may act as a growth stimulator in tumors.⁸ ¹⁰ Overexpression of ET-1 and ET$_B$R was reported in different malignancies including prostate cancer, breast and ovarian carcinomas, and human Kaposi’s sarcoma.¹³ ¹⁳,¹⁶ Hypermethylation of the ET$_B$R correlated with transcriptional down-regulation. Reduced expression of ET$_B$R receptor was observed in several prostate, bladder and colon cancer cell lines.⁹

Currently there is increasing evidence that ET-1 may modulate mitogenesis, apoptosis, angiogenesis, tumor invasion and the development of metastases.³

In breast carcinomas it has been demonstrated that overexpression of ET-1 and ET$_A$R receptor correlated with parameters that characterize aggressive types of breast cancer¹³ suggesting that analysis of ET$_A$R expression might be used as a diagnostic marker for evaluating the progression of the disease and effectiveness of treatment. These and other findings have made ET receptors, and especially ET$_B$R, promising therapeutic targets for pharmacological intervention.

Alomone Labs offers polyclonal antibodies to ET$_A$R (#AER-001), ET$_B$R (#AER-002) and UTIIR (#AER-003) that can be used as research tools for exploring the role of endothelins and Urotensin-II in cancer and other pathologies.

### Related Antibodies

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References:

**Anti-Urotensin II Receptor (UTIIR)**

Product #: AER-003

Host: Rabbit

Epitope: Peptide (C)RLPLTVQRGKRYK, corresponding to residues 154-167 of rat UTIIR.

Putative epitope location:
Intracellular, 2nd Cytoplasmic loop.

Homology with other species:
Bovine – identical; Human, canine (13/14 residues identical).

Applications:
Immunohistochemistry:
Mouse paraffin kidney section.

**Anti-Endothelin Receptor A (ET-A)**

Product #: AER-001

Host: Rabbit

Epitope: Peptide (C)NHNTERSHKSDFSMN, corresponding to amino acid residues 413-426 of rat ET-A.

Putative epitope location:
Intracellular, C-terminus.

Homology with other species:
Human, swine, bovine - 13/14 residues identical; chicken - 12/14 residues identical.

Applications:
Immunohistochemistry:
Rat brain frozen sections.

**Anti-Endothelin Receptor B (ET-B)**

Product #: AER-002

Host: Rabbit

Epitope: peptide CEMLRKKSQGMQALND, corresponding to residues 298-314 of rat ET-B.

Putative epitope location:
Intracellular, i3 loop.

Homology with other species:
All known vertebrate sequences - identical.

Applications:
Immunohistochemistry:
Rat brain frozen sections.

**Western Blotting:**

1. Anti-ET-A antibody (#AER-001) (1:200).
2. Anti-ET-A antibody, preincubated with the control peptide antigen.

Immunohistochemical staining of rat dorsal peri-ventricular thalamus with Anti-ET-B antibody (#AER-002). The specific staining is black. The counterstain is cresyl violet.

**Western Blotting:**

2. Anti-ET-B antibody, preincubated with the control peptide antigen.

Immunohistochemical staining of rat kidney membranes:

1. Anti-UTIIR antibody (#AER-003) (1:200).
2. Anti-UTIIR antibody, preincubated with the control peptide antigen.