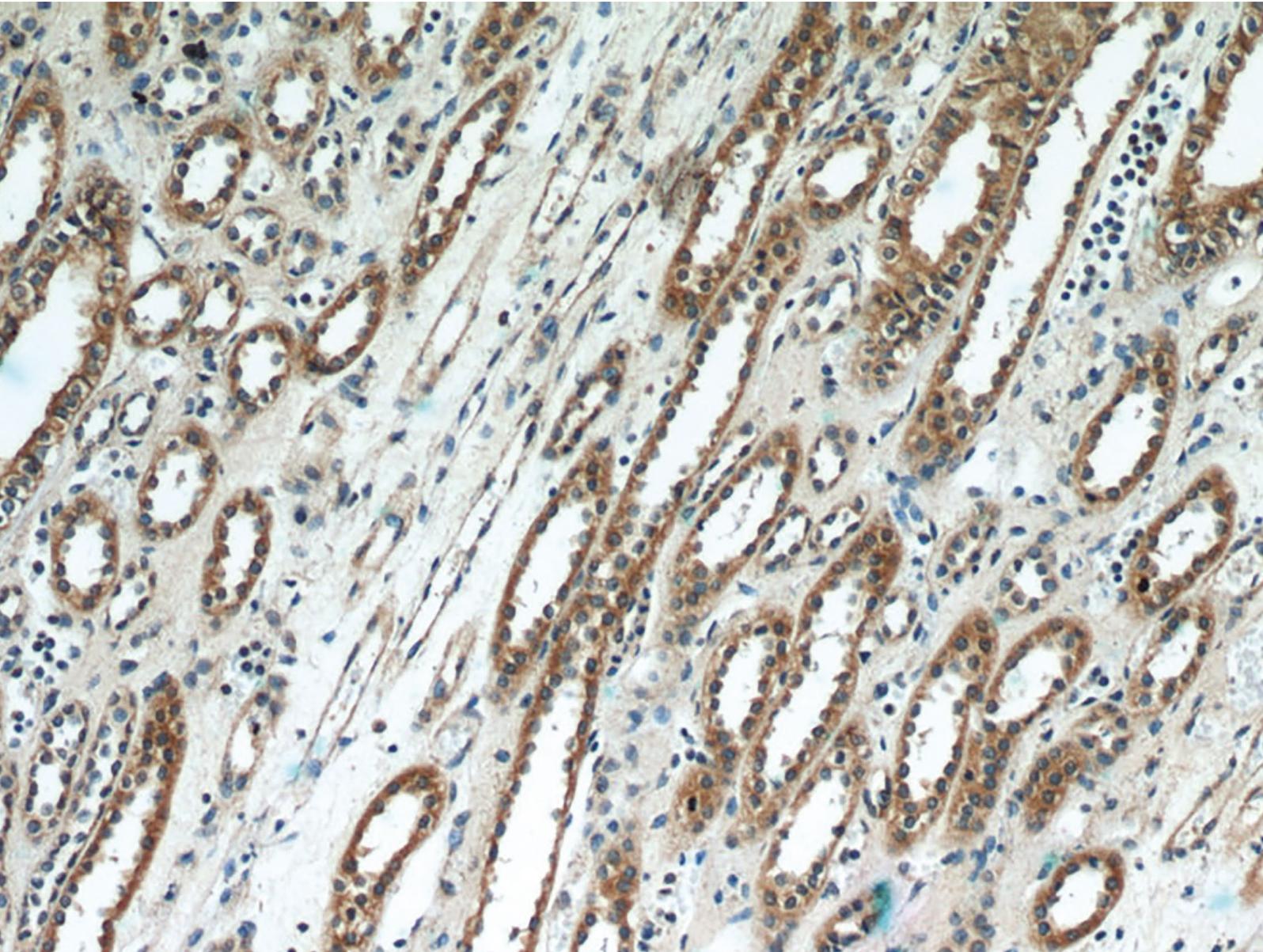


# ANTIBODIES FOR ION HOMEOSTASIS

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**Front Cover:**

*Immunohistochemical staining of paraffin-embedded human kidney tissue slide using SCNN1A antibody (10924-2-AP) at a dilution of 1:50 (10x objective).*

# WELCOME

Ion channels are pore-forming membrane proteins that are present in the membranes of all cells. The main function of ion channels is the maintenance of ion gradients across the cell membrane, shaping action potentials and other electrical signals, controlling the ion flow across secretary and epithelial cells, and regulating the cell volume.

Ion channels play a critical role in physiology and many different biological processes such as neuronal signal transmission, muscle contraction, or T-cell activation. Dysfunction of ion channels is the cause of several diseases and can lead to cystic fibrosis or improper functioning of the nervous system, to name just a few.

Ion channels present a big opportunity for future drug therapies. Therefore, specific and selective targeting with antibodies is essential to understand their complex nature and function.

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## Calcium Ion Homeostasis

Calcium channels allow the passage of calcium ions in response to depolarization of the cell membrane. The accumulation of calcium can then regulate the contraction of muscles, trigger the release of neurotransmitters or hormones, modulate intracellular signaling pathways, and impact several other calcium-dependent cellular functions. Calcium channels play an important role in several diseases, such as diseases related to the cardiovascular or nervous systems.

## PRODUCT FOCUS

### Stanniocalcin 2

Catalog Number  
**10314-1-AP**

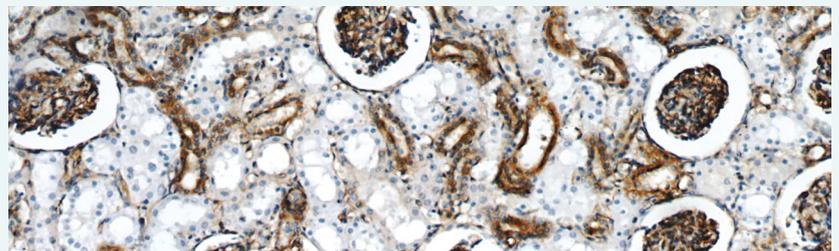
Type  
**Rabbit Polyclonal**

Applications  
**ELISA, IHC, WB**

**4 Publications**

Stanniocalcin (STC) is a family of secreted glycoprotein hormones that were originally discovered in the corpuscles of Stannius, an endocrine gland of fish. STC1 and STC2, two homologues of the STC family, are reported to be involved in calcium and phosphate homeostasis. STC is expressed in a wide variety of tissues such as the kidney, spleen, heart, and pancreas. The protein may play a

role in the regulation of renal and intestinal calcium and phosphate transport, cell metabolism, or cellular calcium/phosphate homeostasis. STC2 overexpression could promote tumor cell proliferation, invasion, and metastasis in prostate cancer, ovarian cancer, or neuroblastoma. STC2 is also vital for cytoprotective properties when exposed to ER stress and hypoxia.



Immunohistochemical staining of paraffin-embedded human kidney using Stanniocalcin 2 antibody (10314-1-AP) at a dilution of 1:50 (10x objective).

### Nucleobindin 1

Catalog Number  
**10228-1-AP**

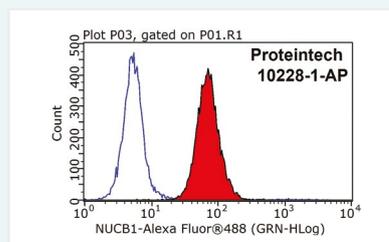
Type  
**Rabbit Polyclonal**

Applications  
**ELISA, FC, IF, IP, WB**

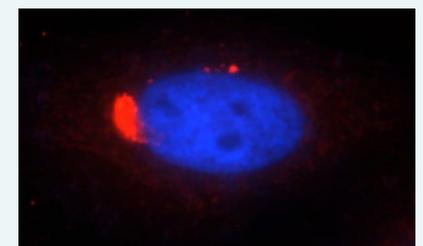
**1 Publication**

Nucleobindin (Nuc) was first identified as a secreted protein of 55 kDa that promotes production of DNA-specific antibodies in lupus-prone MRL/lpr mice. Nuc contains a signal peptide, a DNA-binding site, two calcium-binding motifs (EF-hand motifs), and a leucine zipper. Nucleobindin is

found in both cytosol and membrane and is localized to cis-Golgi cisternae and the cis-Golgi network (CGN). Nucleobindin is involved in autoimmunity, apoptosis, and calcium homeostasis in the bone matrix. NUC was located at human chromosome 19q13.2-q13.4.



1X10<sup>6</sup> HepG2 cells were stained with 0.2ug NUCB1 antibody (10228-1-AP, red) and control antibody (blue), fixed with 90% MeOH blocked with 3% BSA (30 min). Goat Anti-Rabbit IgG(H+L) Alexa Fluor 488-conjugated secondary antibody at a dilution of 1:1000.



Immunofluorescent analysis of HepG2 cells, using NUCB1 antibody (10228-1-AP) at 1:50 dilution and Rhodamine-labeled goat anti-rabbit IgG (red). Blue pseudocolor = DAPI

## Related Antibodies

Antibody Name	Catalog Number	Type	Applications
ATP1A1	<b>2</b> 14418-1-AP	Rabbit Poly	ELISA, IHC, IP, WB
ATP1A1-Specific	55187-1-AP	Rabbit Poly	ELISA, FC, IF, IHC, WB
ATP1A2	16836-1-AP	Rabbit Poly	ELISA, FC, IF, IHC, WB
ATP1A2-Specific	55179-1-AP	Rabbit Poly	ELISA, IHC, WB
ATP1A3	10868-1-AP	Rabbit Poly	ELISA
ATP12A	13231-1-AP	Rabbit Poly	ELISA, WB
ATP13A1	16244-1-AP	Rabbit Poly	ELISA, IF, IP, WB
ATP2C1	13310-1-AP	Rabbit Poly	ELISA, IF, IP, WB
ATP8A1	21565-1-AP	Rabbit Poly	ELISA, WB
Calbindin	14479-1-AP	Rabbit Poly	ELISA, IHC, IP, WB
Calretinin	12278-1-AP	Rabbit Poly	ELISA, IHC, WB
HRC	18142-1-AP	Rabbit Poly	ELISA, IF, WB
Nucleobindin 2	26712-1-AP	Rabbit Poly	ELISA, WB
PMCA2	19678-1-AP	Rabbit Poly	ELISA, IHC, WB
SERCA2	13985-1-AP	Rabbit Poly	ELISA, WB
SERCA3	13619-1-AP	Rabbit Poly	ELISA, IHC, IP, WB
STC1	20621-1-AP	Rabbit Poly	ELISA, WB

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## PRODUCT FOCUS

### Calcium-Sensing Receptor

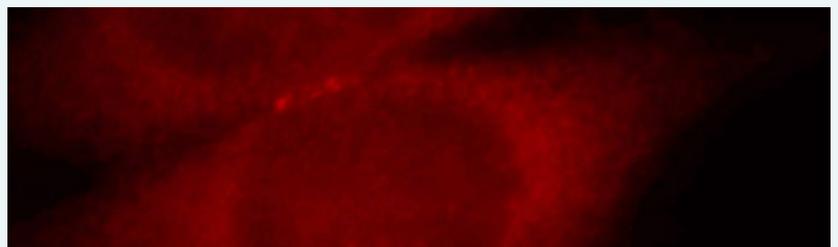
**Catalog Number**  
**19125-1-AP**

**Type**  
**Rabbit Polyclonal**

**Applications**  
**ELISA, IF, WB**

CASR, also known as GPRC2A and PCAR1, belongs to the G-protein-coupled receptor 3 family. Changes in extracellular calcium are thought to modulate a balance between proliferation and differentiation in a variety of cell types. The activity of CASR is mediated by a G-protein that activates a phosphatidylinositol-calcium second messenger system. It has been shown to play a major role in regulating parathyroid hormone secretion and subsequently influence the calcium concentration of extracellular fluids. In normal primary keratinocytes and breast epithelial cells, proliferation is inhibited and

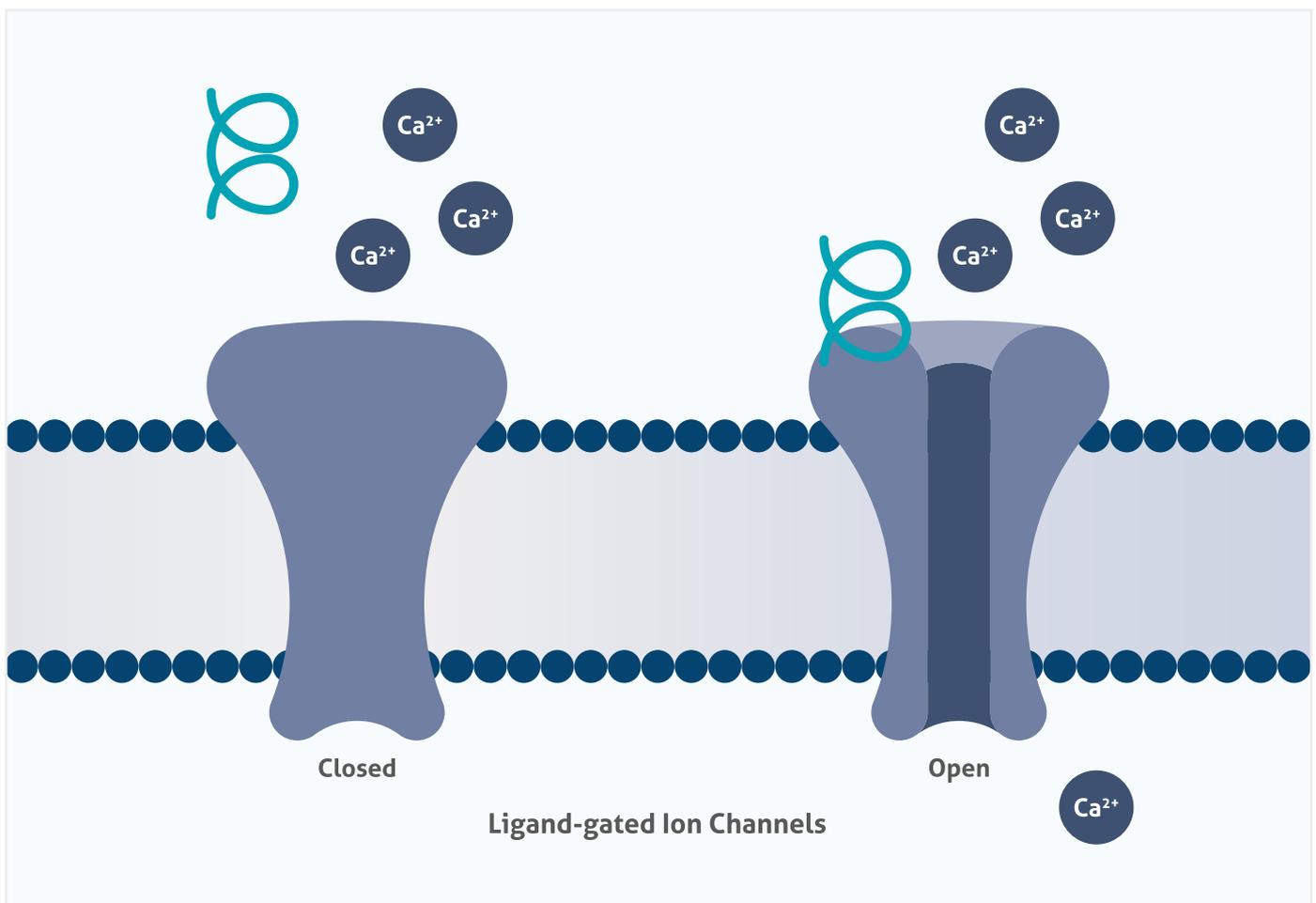
elevated extracellular calcium levels trigger differentiation. Malignant transformations of these cell types are accompanied by a loss of responsiveness to the anti-proliferative effects of elevated extracellular calcium. Several disorders of calcium homeostasis have been linked to mutations in the CaSR. These include familial hypocalciuric hypercalcemia (FHH), neonatal severe hyperparathyroidism (NSHPT), and autosomal dominant hypocalcemia (ADHypo). The 60–65 kDa band detected by this antibody might represent a degradation product of CASR (PMID: 15718278).



Immunofluorescent analysis of HeLa cells, using CASR antibody (19125-1-AP) at a 1:25 dilution and Rhodamine-labeled goat anti-rabbit IgG (red).

## Ligand-gated Ion Channels

Ligand-gated ion channels are located in the cell membrane. They open for ions to pass after binding of their ligand. Ligand binding results in a structural change to the channel and its permeability. The channel can open and ions are able to pass through.



## Related Antibodies

Antibody Name	Catalog Number	Type	Applications
GLRA1	17951-1-AP	Rabbit Poly	ELISA, FC, WB
GLRA2	13831-1-AP	Rabbit Poly	ELISA, IHC, WB
GLRA3	13145-1-AP	Rabbit Poly	ELISA, WB
GLRB	15371-1-AP	Rabbit Poly	ELISA, WB
ITPR1-specific	19962-1-AP	Rabbit Poly	ELISA, FC, IHC, WB
P2RX3	17843-1-AP	Rabbit Poly	ELISA, WB
P2RX4	13534-1-AP	Rabbit Poly	ELISA, FC, IF, IHC, IP, WB
P2RX5	<b>1</b> 19012-1-AP	Rabbit Poly	ELISA, FC, WB
Ryanodine Receptor 2	19765-1-AP	Rabbit Poly	ELISA, IHC, WB
SHROOM1	18218-1-AP	Rabbit Poly	ELISA, WB

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## PRODUCT FOCUS

### P2RX7

**Catalog Number**  
**11144-1-AP**

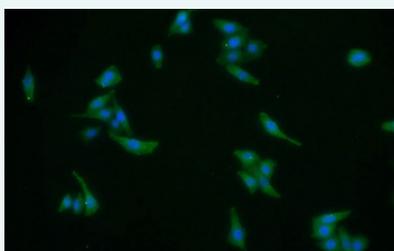
**Type**  
**Rabbit Polyclonal**

**Applications**  
**ELISA, FC, IF, IHC**

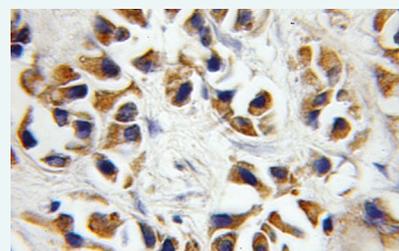
**3 Publications**

P2 receptors are a family of cell surface receptors that mediate a wide variety of physiologic effects in response to extracellular nucleotides. These receptors fall into two classes: P2X receptors, which are ligand-gated ion channels that mediate calcium and potassium fluxes in response to ATP, and P2Y receptors, which are G-protein-coupled receptors (GPCRs).

P2RX7 functions as a ligand-gated ion channel and is responsible for ATP-dependent lysis of macrophages through the formation of membrane pores permeable to large molecules. P2RX7 is highly expressed by cells of the haemopoietic lineage and can mediate cell death, killing of infectious organisms, and regulation of the inflammatory response.



*Immunofluorescence staining of HeLa cells using P2RX7 antibody (11144-1-AP) at a dilution of 1:50 and goat anti-rabbit IgG(H+L) Alexa Fluor 488-conjugated secondary antibody.*



*Immunohistochemical staining of paraffin-embedded human prostate cancer using P2RX7 antibody (11144-1-AP) at a dilution of 1:50 (10x objective).*

### HTR3A

**Catalog Number**  
**10443-1-AP**

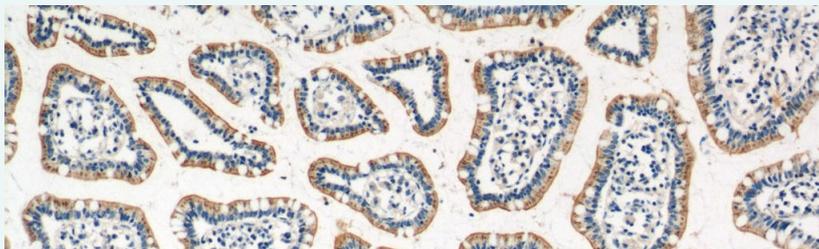
**Type**  
**Rabbit Polyclonal**

**Applications**  
**ELISA, FC, IHC, WB**

**1 Publication**

HTR3A (5-hydroxytryptamine receptor 3A, 5-HT3A) belongs to the ligand-gated ion channel receptor superfamily. It is the subunit A of the type 3 receptor for 5-hydroxytryptamine (5-HT, serotonin), a biogenic hormone that functions as a neurotransmitter, hormone, and mitogen.

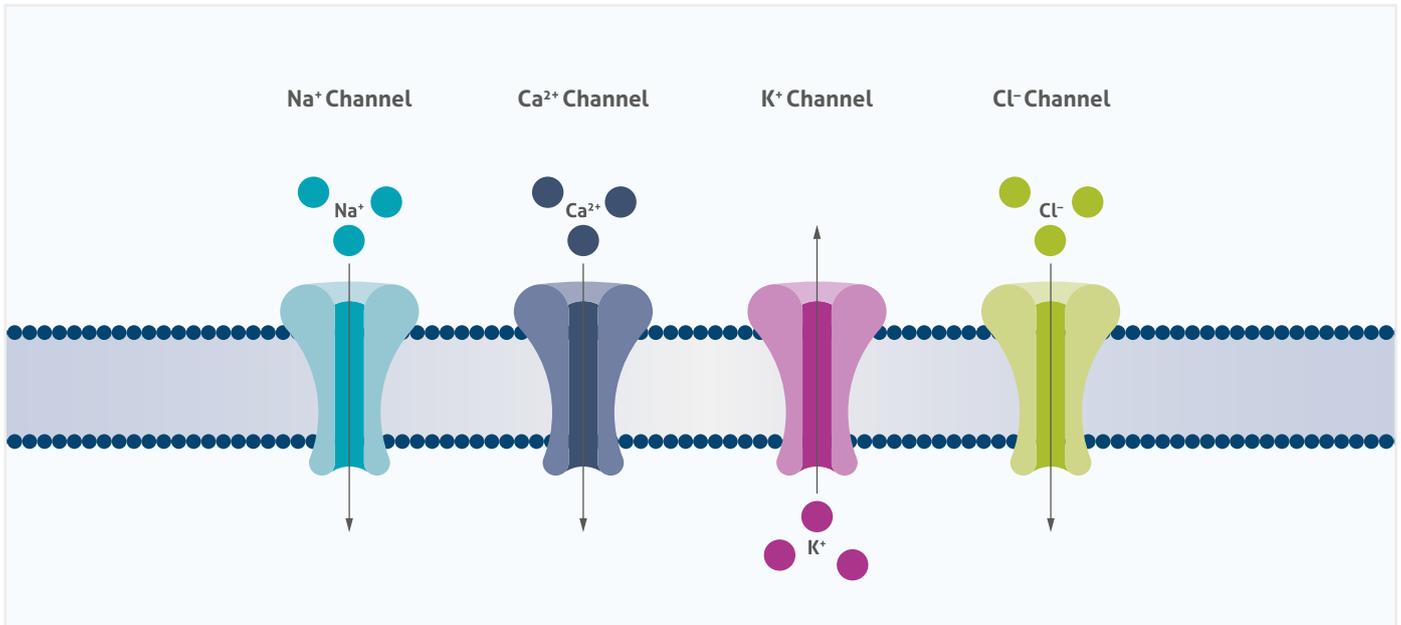
So far, five distinct 5-HT3 receptor subunits (A-E) have been identified. HTR3A can form functional homomers or heteromers with HTR3B, HTR3C, HTR3D, or HTR3E. 5-HT3 receptors are capable of mediating fast excitatory neurotransmission in the CNS and peripheral nervous system (PNS).



*Immunohistochemical staining of paraffin-embedded human small intestine tissue slide using HTR3A antibody (10443-1-AP) at a dilution of 1:50 (10x objective).*

## Voltage-gated Ion Channels

Voltage-gated ion channels (VDAC) open selectively for  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Ca}^{2+}$ , or  $\text{Cl}^-$ , whereat the voltage-gated  $\text{K}^+$  channels display the most diverse subtype. Alterations in the voltage across the membrane can open or close the channels. VDACS are present in all neurons, especially the sodium and potassium channels along the axons, which play a fundamental role in the generation of action potential and signaling between neurons.



## Related Antibodies

Antibody Name	Catalog Number	Type	Applications
TRPA1	19124-1-AP	Rabbit Poly	ELISA, FC, WB
VDAC1	55259-1-AP	Rabbit Poly	ELISA, FC, IHC, IP, WB
VDAC2	5 11663-1-AP	Rabbit Poly	ELISA, IHC, IP, WB
VDAC3	1 14451-1-AP	Rabbit Poly	ELISA, IHC, WB

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## PRODUCT FOCUS

### VDAC1/Porin

**Catalog Number**  
10866-1-AP

**Type**  
Rabbit Polyclonal

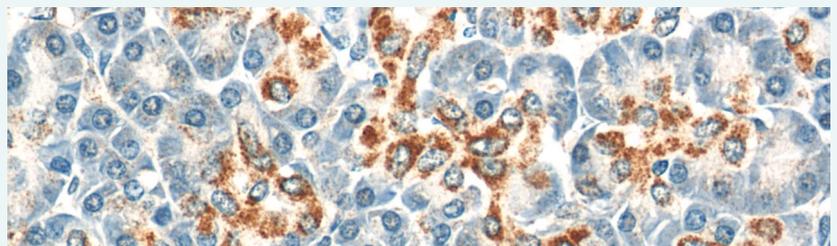
**Applications**  
ELISA, IF, IHC, IP, WB

24 Publications

KD/KO Validated

VDAC1, also known as VDAC, Porin 31HM, Porin 31HL, and Plasmalemmal porin, belongs to the eukaryotic mitochondrial porin family. It adopts an open conformation at low or zero membrane potential and a closed conformation at potentials above 30-40 mV, to form a channel through the

mitochondrial outer membrane and also the plasma membrane. Unlike other membrane transport proteins, porins are large enough to allow passive diffusion. It is a 31kd membrane protein conserved in chimpanzee, dog, cow, mouse, rat, chicken, and zebrafish.



Immunohistochemical staining of paraffin-embedded human pancreas using VDAC1/Porin antibody (10866-1-AP) at a dilution of 1:50 (40x objective).

## Cyclic Nucleotide-gated Ion Channels

Cyclic nucleotide-gated (CNG) channels belong to the family of voltage-gated ion channels. CNGs open after direct binding of cyclic nucleotides, cAMP, and cGMP. CNG channels are nonselective cation channels that poorly discriminate between alkali ions and even allow the passage of divalent cations.

### Related Antibodies

Antibody Name	Catalog Number	Type	Applications
CNGA3	21657-1-AP	Rabbit Poly	ELISA, WB
HCN3	13745-1-AP	Rabbit Poly	ELISA, WB
HCN4	55224-1-AP	Rabbit Poly	ELISA, WB

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## PRODUCT FOCUS

### HCN1

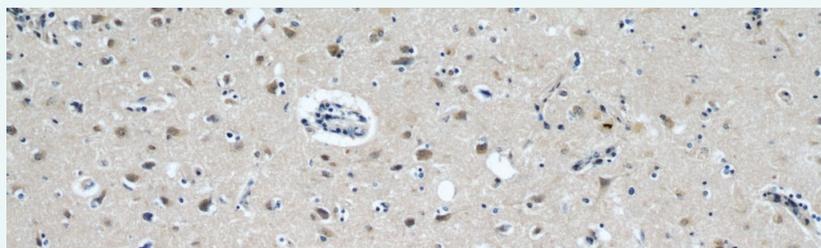
**Catalog Number**  
**55222-1-AP**

**Type**  
**Rabbit Polyclonal**

**Applications**  
**ELISA, IHC, IP, WB**

HCN1, also known as BCNG1, belongs to the potassium channel HCN family. Its hyperpolarization-activated ion channel exhibits weak selectivity for potassium over sodium ions. HCN1 contributes to the native

pacemaker currents in the heart (If) and in neurons (Ih). It is activated by cAMP, and at 10–100 times higher concentrations, and also by cGMP.



*Immunohistochemical staining of paraffin-embedded human brain using HCN1 antibody (55222-1-AP) at a dilution of 1:50 (10x objective).*

### HCN2

**Catalog Number**  
**55245-1-AP**

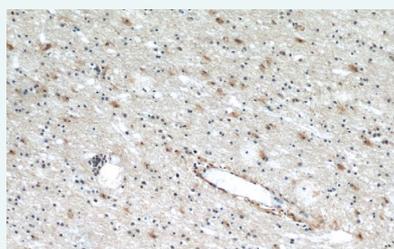
**Type**  
**Rabbit Polyclonal**

**Applications**  
**ELISA, IHC, IP, WB**

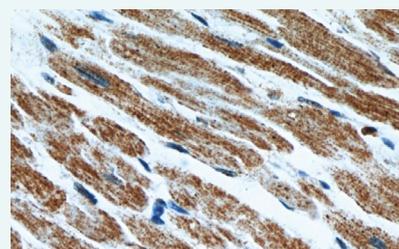
**1 Publication**

HCN2, also known as BCNG2, is a member of the potassium channel HCN family. HCN2 produces a large instantaneous current in neurons. It is activated by cAMP. HCN2 is

modulated by intracellular chloride ions and pH; acidic pH shifts the activation to more negative voltages.



*Immunohistochemical staining of paraffin-embedded human brain using HCN2 antibody (55245-1-AP) at a dilution of 1:50 (10x objective).*



*Immunohistochemical staining of paraffin-embedded human heart using HCN2 antibody (55245-1-AP) at a dilution of 1:50 (40x objective).*

## More Antibodies Related To Diverse Ion Channels

# PRODUCT FOCUS

### SCNN1A

**Catalog Number**  
**10924-2-AP**

**Type**  
**Rabbit Polyclonal**

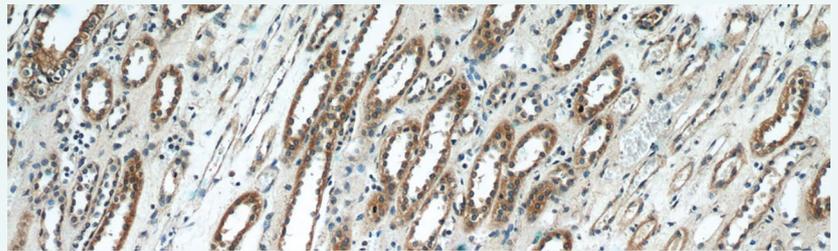
**Applications**  
**ELISA, IHC, WB**

**4 Publications**

**KD/KO Validated**

SCNN1A (sodium channel, non-voltage-gated 1 alpha), also known as ENaCA (epithelial Na<sup>+</sup>) channel subunit alpha) or amiloride-sensitive sodium channel subunit alpha, is the alpha subunit of the epithelial Na<sup>+</sup> channel (ENaC). ENaC is expressed in the apical membrane of salt-absorbing epithelia of kidney, distal colon, and lung. ENaC is a non-voltage-gated, constitutively active channel highly selective

for sodium. It has an essential role in salt and fluid homeostasis across epithelial tissues. ENaC consists of three different subunits: alpha, beta, and gamma. Mutations in the gene of SCNN1A have been associated with pseudohypoaldosteronism type 1 (PHA1), a rare salt-wasting disease resulting from target organ unresponsiveness to mineralocorticoids.



*Immunohistochemical staining of paraffin-embedded human kidney tissue slide using SCNN1A antibody (10924-2-AP) at a dilution of 1:50 (10x objective).*

### $\beta$ -ENaC

**Catalog Number**  
**14134-1-AP**

**Type**  
**Rabbit Polyclonal**

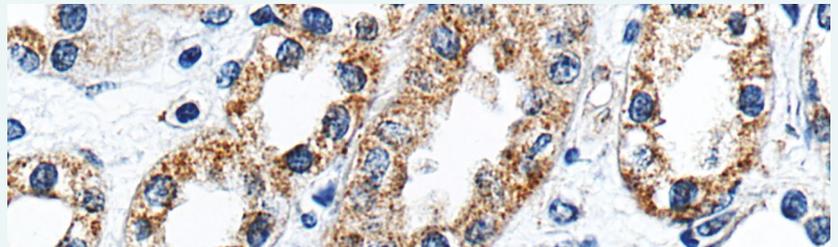
**Applications**  
**ELISA, IHC, WB**

**2 Publications**

**KD/KO Validated**

$\beta$ -ENaC belongs to the amiloride-sensitive sodium channel (TC 1.A.6) family. The sodium-permeable non-voltage-sensitive ion channel is inhibited by the diuretic amiloride.  $\beta$ -ENaC mediates electrodiffusion of the luminal

sodium (and water, which follows osmotically) through the apical membrane of epithelial cells. It controls the reabsorption of sodium in the kidney, colon, lung, and sweat glands.  $\beta$ -ENaC also plays a role in taste perception.



*Immunohistochemistry of paraffin-embedded human kidney tissue slide using  $\beta$ -ENaC antibody (14134-1-AP) at a dilution of 1:200 (40x objective).*

You can place your order online, by email, or fax.

Antibody Name	Catalog Number	Type	Applications
ASIC2	1 17851-1-AP	Rabbit Poly	ELISA, IP, WB
ASIC4	12003-1-AP	Rabbit Poly	ELISA, WB
ATPB	5 17247-1-AP	Rabbit Poly	ELISA, IF, IHC, IP, WB
ATP6V1B1	2 14780-1-AP	Rabbit Poly	ELISA, WB
ATP6V1B2	15097-1-AP	Rabbit Poly	ELISA, IHC, IP, WB
LENG9	16295-1-AP	Rabbit Poly	ELISA, IF, IHC, WB
NUPL2	16587-1-AP	Rabbit Poly	ELISA, WB
SCNN1G	2 13943-1-AP	Rabbit Poly	ELISA, IHC, WB
TRPC1	1 19482-1-AP	Rabbit Poly	ELISA, FC, IF, WB
TRPC4	21349-1-AP	Rabbit Poly	ELISA, IHC, WB
TRPC5	25890-1-AP	Rabbit Poly	ELISA, IF, WB
TRPM1	55111-1-AP	Rabbit Poly	ELISA, FC, IF
TRPM5	18027-1-AP	Rabbit Poly	ELISA, IF, IP, WB
TRPM6	55455-1-AP	Rabbit Poly	ELISA, IF
TRPM8	12813-1-AP	Rabbit Poly	ELISA
TRPV1	22686-1-AP	Rabbit Poly	ELISA, IHC, WB

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## PRODUCT FOCUS

### ATP6V1A

**Catalog Number**  
**17115-1-AP**

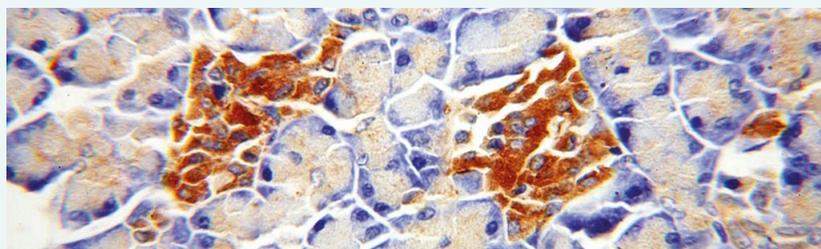
**Type**  
**Rabbit Polyclonal**

**Applications**  
**ELISA, IHC, IP, WB**

**3 Publications**

The vacuolar-type H(+)-ATPase (V-ATPase) is responsible for the acidification of endosomes, lysosomes, and other intracellular organelles. It is also involved in hydrogen ion transport across the plasma membrane into the extracellular space. The V-ATPase

is a multisubunit complex with cytosolic and transmembrane domains. The cytosolic catalytic domain consists of 3 A subunits and 3 B subunits, which bind and hydrolyze ATP, as well as regulatory accessory subunits. ATP6V1A is a V-type proton ATPase catalytic subunit A.



*Immunohistochemical staining of paraffin-embedded human pancreas using ATP6V1A antibody (17115-1-AP) at a dilution of 1:100 (40x objective).*

# CONTACT US

## Proteintech Group *US Head Office*

**PHONE** 1 (888) 4PTGLAB  
(1-888-478-4522)  
(toll free in USA),  
or 1(312) 455-8498  
(outside USA)

**FAX** 1 (312) 455-8408

**ADDRESS** Proteintech Group, Inc.  
5400 Pearl Street, Suite 300,  
Rosemont, IL 60018, USA

**EMAIL** proteintech@ptglab.com

## Proteintech Europe *United Kingdom*

**PHONE** +44 (161) 8393007

**FAX** +44 (161) 2413103

**ADDRESS** Proteintech Europe, Ltd.  
4th Floor,  
196 Deansgate,  
Manchester, M3 3WF

**EMAIL** europe@ptglab.com

## Proteintech Europe *Germany*

**EMAIL** germany@ptglab.com  
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## Proteintech *China Office*

**PHONE** 027-87531629  
or 4006-900-926

**FAX** 027-87531627

**ADDRESS** Wuhan Sanying Biotechnologies  
D3-3, No.666 Gaoxin Avenue,  
Wuhan East Lake Hi-tech Development Zone  
Wuhan, Hubei, P.R.C

**EMAIL** Proteintech-CN@ptglab.com

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