

Product Specification Sheet

**Hyperpolarization-activated Cyclic Nucleotide-gated channel 4 (HCN4) Antibodies**

Cat. # HCN41-S	Rabbit Anti-Rat HCN4 antiserum	<b>SIZE:</b> 100 ul
Cat. # HCN41-A	Rabbit Anti-Rat HCN4 IgG (Aff pure)	<b>SIZE:</b> 100 ug
Cat. # HCN41-P	Rat HCN4 Control/blocking peptide	<b>SIZE:</b> 100 ug

Biological rhythms (beating of the heart, circadian sleep cycles, respiration, and the release of hormones) are necessary to sustain life. Heart beating is the most reliable and rhythmic biological phenomenon. Cardiac pacemaking is produced by the slow diastolic depolarization phase of the action potential. The hyperpolarization-activated cation current (termed  $I_f$ ,  $I_h$ , or  $I_q$ ) plays a key role in the initiation and modulation of cardiac and neuronal pacemaker depolarization. The generation of cardiac pacemaker potentials relies on a complex interplay between at least four different types of cation channels: T- and L-type  $Ca^{2+}$  channels,  $K^+$  channels, and a cation channel termed  $I_f$  (synonymous names are  $I_h$  and  $I_q$ ). The  $I_f$  channel has been designated as "pacemaker" channel because it reveals unique features that are believed to be a prerequisite for pacemaker activity. Recently, the **hyperpolarization-activated cyclic nucleotide-gated families of ion channel proteins (HCN1-4)** have been identified as the "pacemaker" channel. The amino acid sequences of HCNs predict a structure similar to that of voltage-gated (Kv) channels and cyclic nucleotide-gated (CNG) channels. HCNs proteins (HCN1-4) are characterized by six transmembrane domains (S1-S6), including a positively charged voltage-sensing S4 segment and an **ion-conducting pore** between S5 and S6. In the C terminus the HCNs carry a cyclic nucleotide-binding domain (CNBD), a motif found in several cyclic nucleotide-binding proteins. The core region of HCNs channels (S1 to the C terminus of the CNBD) is highly conserved, whereas the cytoplasmic N and C-termini, vary considerably in their length and share only weak sequence homology.

**HCN4** (rat 1198 aa, human 1203-aa, chromosome 15q24-q25) is highly expressed at heart ventricle and atrium, brain (olfactory bulb, thalamus), and testis. expressed in brain.

**Source of Antigen and Antibodies**

<b>Antigen</b>	15-aa peptide from <b>rat HCN4(1)</b> ; (Gene Accession #NP067690.1) <b>Designation (#HCN41-P, control/blocking peptide)</b> conjugated to KLH; <b>Epitope location</b> ~ C-terminal, Cytoplasmic domain
<b>Ab Host/type</b>	Rabbit, Polyclonal unpurified antiserum (#HCN41-S) and IgG, purified over antigen-agarose (Cat # HCN41-A)
<b>2-Ab</b>	Cat # 20320, <b>goat anti-rabbit IgG-HRP</b> (AP, biotin, FITC conjugates also available).
<b>-ve control</b>	# 20009-1, Rabbit (non-immune) IgG, purified, suitable for ELISA, Western, IHC as -ve control

**Form & Storage of Antibodies/Peptide Control**

**Antiserum (unpurified)**

100ul solution lyophilized powder  
Supplied in Buffer: 0.05% azide  
**Reconstitute** powder in 100 ul PBS

**Affinity pure IgG**

100 ug/100ul solution lyophilized powder  
Supplied in **Buffer:** PBS+0.1% BSA  
**Reconstitute powder** in PBS at 1mg/ml

**Control/blocking peptide**

100 ug/100 ul solution lyophilized powder  
Supplied in Buffer: PBS pH 7.5,  
**Reconstitute powder** in PBS at 1 mg/ml.

**Storage**

**Short-term:** unopened, undiluted liquid vials at -20OC and powder at 4oC or -20oC..

**Long-term:** at -20C or below in suitable aliquots after reconstitution. Do not freeze and thaw and store working, diluted solutions.

**Stability:** 6-12 months at -20oC or below.

**Shipping:** 4oC for solutions and room temp for powder

**Recommended Usage**

**Western Blotting** (1:1K-5K for neat serum and 1-10 ug/ml for affinity pure using Chemiluminescence technique).

**ELISA** (1:10K-1:100K; using 50-100 ng of control peptide/well).

**Histochemistry & Immunofluorescence:** not tested. We recommend the use of affinity pure antibody at 2-20 ug/ml.

**Specificity & Cross-reactivity**

The rat HCN41-P peptide is 100% conserved in mouse, 93% in rabbit and 86% in human or primate HCN4. No significant sequence homology of HCN41-P is seen with other HCNs or any other protein. Antibody reactivity in various species is not known. The HCN41-P Control peptide, because of its low mol. Wt (<3 kDa), is not suitable for Western. It should be used for ELISA or antibody blocking experiments (use 5-10 ug control peptide per 1 ug of aff pure IgG or 1 ul antiserum) to confirm antibody specificity (see detailed protocol at the web site).

**General References:** (1) Seiffert R (1999) PNAS 96, 9391; Montegia LM (2000) Brain Res. Mol. Brain Res. 81, 129; Ludwig A (1999) EMBO J. 18, 2323; Stevesn DR (2001) Nature 413, 631; Biel M (2002) Trend Cardiovasc. Med. 12, 206-213 (review)

*\*This product is for In vitro research use only.*

**Related materials available from ADI**

Antibodies: HCN1-4, CNG1-4.

HCN41-S-A-P

71214A

**India Contact:**

**Life Technologies (India) Pvt. Ltd.**

306, Aggarwal City Mall, Opposite M2K Pitampura, Delhi – 110034 (INDIA). Ph: +91-11-42208000, 42208111, 42208222, Mobile: +91-9810521400, Fax: +91-11-42208444  
Email: [customerservice@lifetechindia.com](mailto:customerservice@lifetechindia.com) Website: [www.lifetechindia.com](http://www.lifetechindia.com)