

KCC4 (C-12): sc-19427

BACKGROUND

The four isoforms of potassium/chloride co-transport channels (KCC) belong to a superfamily of cation-chloride co-transporters involved in cell volume maintenance. Nitric oxide (NO) donors activate KCCs, while inhibitors of the cGMP pathway prevent NO donor activation. The ubiquitously expressed KCC1 contains 12 transmembrane domains with both cytoplasmic N and C terminal domains. KCC2 expression is limited to neuronal tissues by a restrictive element similar to the neuronal-restrictive silencing factor. In neurons, KCC2 expression is correlated with an inhibitory response to GABA, while the absence of KCC2 is necessary for an unusual excitatory response to GABA. Alterations of KCC2 expression in the inferior colliculus of rat brain may be related to seizure susceptibility. Conversely, KCC3 is not suspected to play a major role in epilepsy. The two splice variants of KCC3, KCC3 α and KCC3 β , are predominantly expressed in brain and kidney, respectively, while KCC4 is expressed in muscle, brain, lung, heart and kidney.

REFERENCES

1. Lauf, P.K. and Adragna, N.C. 2000. K-Cl cotransport: properties and molecular mechanism. *Cell. Physiol. Biochem.* 10: 341-354.
2. Di Fulvio, et al. 2001. Protein kinase G regulates potassium chloride cotransporter-3 expression in primary cultures of rat vascular smooth muscle cells. *J. Biol. Chem.* 276: 21046-21052.
3. Lauf, P.K., et al. 2001. K-Cl cotransport: immunohistochemical and ion flux studies in human embryonic kidney (HEK293) cells transfected with full-length and C-terminal-domain-truncated KCC1 cDNAs. *Cell. Physiol. Biochem.* 11: 143-160.
4. Karadsheh, M.F. and Delpire, E. 2001. Neuronal restrictive silencing element is found in the KCC2 gene: molecular basis for KCC2-specific expression in neurons. *J. Neurophysiol.* 85: 995-997.
5. Hubner, C.A., et al. 2001. Disruption of KCC2 reveals an essential role of K-Cl cotransport already in early synaptic inhibition. *Neuron* 30: 515-524.
6. Kanaka, C., et al. 2001. The differential expression patterns of messenger RNAs encoding K-Cl cotransporters (KCC1,2) and Na-K-Cl cotransporter (NKCC1) in the rat nervous system. *Neuroscience* 104: 933-946.
7. Reid, K.H., et al. 2001. The mRNA level of the potassium-chloride cotransporter KCC2 covaries with seizure susceptibility in inferior colliculus of the post-ischemic audiogenic seizure-prone rat. *Neurososci. Lett.* 308: 29-32.
8. Steinlein, O.K., et al. 2001. Mutation analysis of the potassium chloride cotransporter KCC3 (SLC12A6) in rolandic and idiopathic generalized epilepsy. *Epilepsy Res.* 44: 191-195.

CHROMOSOMAL LOCATION

Genetic locus: SLC12A7 (human) mapping to 5p15.33; Slc12a7 (mouse) mapping to 13 C1.

STORAGE

Store at 4° C, ****DO NOT FREEZE****. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

SOURCE

KCC4 (C-12) is an affinity purified goat polyclonal antibody raised against a peptide mapping within an internal region of KCC4 of human origin.

PRODUCT

Each vial contains 200 μ g IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Blocking peptide available for competition studies, sc-19427 P, (100 μ g peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% BSA).

APPLICATIONS

KCC4 (C-12) is recommended for detection of KCC4 of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for KCC4 siRNA (h): sc-42610, KCC4 siRNA (m): sc-42611, KCC4 shRNA Plasmid (h): sc-42610-SH, KCC4 shRNA Plasmid (m): sc-42611-SH, KCC4 shRNA (h) Lentiviral Particles: sc-42610-V and KCC4 shRNA (m) Lentiviral Particles: sc-42611-V.

RECOMMENDED SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: use donkey anti-goat IgG-HRP: sc-2020 (dilution range: 1:2000-1:100,000) or Cruz Marker™ compatible donkey anti-goat IgG-HRP: sc-2033 (dilution range: 1:2000-1:5000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto A Blocking Reagent: sc-2333 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use donkey anti-goat IgG-FITC: sc-2024 (dilution range: 1:100-1:400) or donkey anti-goat IgG-TR: sc-2783 (dilution range: 1:100-1:400) with UltraCruz™ Mounting Medium: sc-24941.

SELECT PRODUCT CITATIONS

1. Capó-Aponte, J.E., et al. 2007. Potassium-chloride cotransporter mediates cell cycle progression and proliferation of human corneal epithelial cells. *Cell Cycle* 6: 2709-2718.
2. Chen, Y.F., et al. 2009. Motor protein-dependent membrane trafficking of KCl cotransporter-4 is important for cancer cell invasion. *Cancer Res.* 69: 8585-8593.

RESEARCH USE

For research use only, not for use in diagnostic procedures.

PROTOCOLS

See our web site at www.scbt.com or our catalog for detailed protocols and support products.