

Peptide Based Inhibitor of Calcium Current

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Technology description

This technology is a short fragment of a naturally occurring peptide that can be used to regulate the density of calcium current in mammalian cells. Modulation of calcium current across cell membranes is an essential step in muscle contraction, neuronal signaling, and hormone release.

DESCRIPTION/DETAILS

Voltage dependent channels are multimetric proteins that reside within the surface membranes of cells. The activation of these channels allows for a wide range of cellular functions to take place, such as the release of neurotransmitters, muscle contraction, and the transmission of pain signals. Any chemical agent that alters calcium channel function has the ability to modify these, and many other, cellular processes.

Calcium Channels are already targets of therapeutic agents and regulatory therapies for individuals who struggle with various symptoms related to restricted blood-flow, as well as therapies aimed at pain pathways. Calcium channel blockers (CCBs), for instance, behave like cork stoppers in a bottle, preventing any calcium ions from passing through the plugged channel. This affect can decrease workload on a stressed heart and prevent it from operating anaerobically and can regulate the contractility of vascular smooth muscle to decrease blood pressure.

Our calcium channel inhibitor is based on a naturally occurring peptide that is known to regulate calcium current density. By mimicking the action of the identified 6 subunit, this synthetic, lipophilic peptide alters the density of calcium current by decreasing the number of active channels in the cell.

Application area

Expression of this peptide fragment within the cell reduces the normal calcium current by 30% ~ 50%, which can greatly alter the cell function. This peptide is a strong candidate for further pharmaceutical research and drug design.

Variety of heart related conditions: Some conditions currently treated with calcium-channel blockers include high blood pressure, abnormally rapid heart rhythms, and angina pectoris - a certain type of chest pain related to restricted blood flow to the heart.

Improve blood flow to different regions of body: Other than the well-documented cardio-vascular benefits, the way in which calcium current regulators have been shown to relax arteries and improve

blood flow has led doctors to prescribe them as preventative medications for chronic migraines and as a way to reduce the severity of bi-polar disorder and panic attacks.

Chronic pain and neuronal messaging: Cell membranes have numerous calcium channels. This peptide has the potential to regulate not only muscle contraction and blood flow but also the chemical signals that trigger neural signaling

Advantages

This calcium current inhibitor represents a mechanistically novel, potentially safer, method of regulating calcium current density by altering the number of active calcium channels in the membrane rather than interfering with the movement of calcium through channels as is the case with the calcium channel blockers (CCBs).

Present in human tissue: This peptide fragment is derived from a naturally occurring compound already found in cell membranes. By exposing certain cells to the peptide, regulation of the calcium current can be achieved.

Small lipophilic peptide fragment: The peptide fragment's short length, high functionality, and lipid solubility make it a great candidate for a small-molecule therapeutic delivery system.

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