Austrian Association of Molecular Life Sciences and Biotechnology (ÖGMBT)
&
Doctoral College Metabolic & Cardiovascular Disease (DK-MCD)

Molecular dynamics of the skeletal muscle voltage-gated calcium channel: gating and subunit interactions

GUEST LECTURE by

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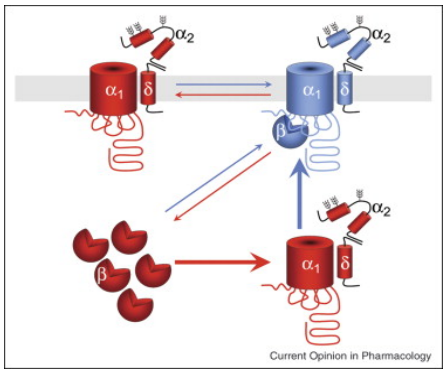
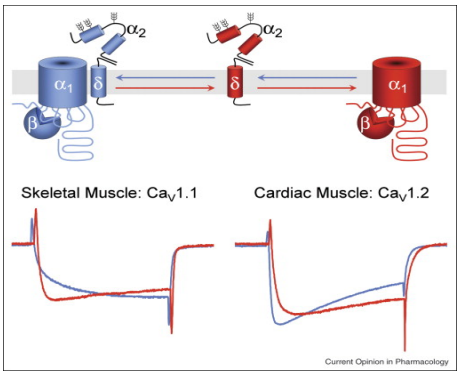
HS 07.02 Preclinics (Harrachgasse 21), MUG

Abstract

Voltage-gated calcium channels are expressed in all excitable tissues where, in response to membrane depolarization, they control a variety of cell functions like contraction of muscles, secretion in endocrine cells and neurons, or gene regulation. Functional calcium channels consist of one α_1 subunit and at least one extracellular $\alpha_2\delta$ and a cytoplasmic β subunit. The α_1 subunit forms the voltage-sensor and the channel pore, whereas the auxiliary $\alpha_2\delta$ and β subunits function in membrane targeting and modulation of gating and current properties. Recent biophysical experiments will be presented, which answer two longstanding questions in the calcium channel field: (1) What determines the paradoxical gating properties of the skeletal muscle calcium channel $Ca_V1.1$, and (2) can auxiliary β subunits dynamically exchange with functional calcium channel complexes?



Modulation of membrane expression and current properties of Ca^{2+} channels by auxiliary β subunits.



Model for the modulation of Ca^{2+} channels by association and dissociation of auxiliary α2δ subunits.

from: **Auxiliary Ca(2+) channel subunits: lessons learned from muscle.**
Obermair GJ, Tuluc P, Flucher BE., Curr Opin Pharmacol. 2008 Jun;8(3):311-8. Review.