

综述

环核苷酸门控离子通道门控的分子机理

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摘要

环核苷酸门控离子通道(CNG)最广泛地分布于神经细胞。近年来关于CNG通道门控的分子机制的研究取得了很大的进步。研究表明, CNG通道的组成及组装影响通道的特性及门控。近年来有关CNG突变体的研究及半胱氨酸残基亲和性的分析表明, 环核苷酸首先结合到CNG通道C端的环核苷酸结合域(CNBD)上引起CNBD空间构像改变, 然后4个亚单元发生空间构像的协调改变, CNG通道开放。本文详细讨论了CNG通道的门控机制、各亚单元之间的相互作用、组装的过程及其空间构像的变化, 为CNG通道的进一步研究, 尤其是离子通道疾病方面提供理论指导。

关键词 [环核苷酸门控离子通道; 构像改变; 门控](#)

分类号

Molecular Mechanisms of Cyclic Nucleotide-Gated Ion Channel Gating

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Abstract

Cyclic nucleotide-gated ion channels (CNGs) are distributed most widely in the neuronal cell. Great progress has been made in molecular mechanisms of CNG channel gating in the recent years. Results of many experiments have indicated that the stoichiometry and assembly of CNG channels affect their property and gating. Experiments of CNG mutants and analyses of cysteine accessibilities show that cyclic nucleotide-binding domains (CNBD) bind cyclic nucleotides and subsequently conformational changes occurred followed by the concerted or cooperative conformational change of all four subunits during CNG gating. In order to provide theoretical assistances for further investigation on CNG channels, especially regarding the disease pathogenesis of ion channels, this paper reviews the latest progress on mechanisms of CNG channels, functions of subunits, processes of subunit assembly, and conformational changes of subunit regions during gating.

Key words [cyclic nucleotide-gated ion channel \(CNG\)](#) [conformational change](#) [gating](#)

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