

Functional significance of rSK2 N-terminal region revealed by electrophysiology and Preliminary Structural Studies

Narae Shin, Gil-boo Kang, Soo Hyun Eom and Chul-Seung Park

Department of Life Science, Kwangju Institute of Science and Technology (K-JIST), Gwangju 500-712, Korea

Small conductance calcium-activated potassium channels (or SK_{Ca} channels) are potassium selective, voltage-independent, and activated by intracellular calcium concentration. These channels play important roles in excitable cells such as neuron in the central nervous system (Vergara et al., 1998). The activity of SK_{Ca} channels underlies the slow afterhyperpolarization that inhibits neuronal cell firing (Hille, 1991; Vergara et al., 1998). Until now, N-terminal region of rSK2 isn't characterized. To study the role of N-terminus, we constructed the N-terminal deletion mutant and characterized by electrophysiological means. Interestingly, N-terminal deletion mutant be trafficked to membrane couldn't evoke any ionic currents. Thus, N-terminal region has a role in functional rSK2 channel formation. To elucidate the function of N-terminal region, (His)₆-conjugated protein was purified and filtrated by affinity column chromatography. Surprisingly, N-terminal region was shown in tetramer size that was supported by cross-linking result. Thus, we predicted that N-terminal region might be involved in the tetramerization of rSK2.