

EFFECT OF OPHIOBOLIN A ON KIR2.1 POTASSIUM CHANNEL IN CHICKEN SKELETAL MUSCLE CELLS

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Abstract

Ophiobolins are members of the family of phytotoxic metabolites, and they possess antitumor, antibacterial and antifungal activities. The ophiobolin A and derivatives exhibit a broad spectrum of biological activities but their biological consequence are not well known. The cellular inward rectifier currents (I_{K1}) are sustained by kir2.1 ion channels mainly and have a role in maintaining the resting membrane potential, contributing to the beginning and the final repolarization in all cells. Recently, it was revealed in our laboratory that the 6-epi-ophiobolin A (6EOPA) influenced the elasticity of the cell surface, the Young's modulus had been moderately changed as well as the cell volume and the heights of the cells.

Aim and methods: The aim of this study was to investigate the effect of 6EOPA on chicken skeletal muscle cells. For this purpose, we treated muscle cells with low concentration of OPA as an external stimulus and used immunofluorescence method for labelling kir2.1 channel complexes. Detection was performed with an Olympus FV1000 confocal laser scanning microscope.

Results: The kir2.1 ion channels are colocalized with anchoring protein of synapse-associated protein 97 (Sap97) in non-treated cells, but we determined only partial overlaid kir2.x channel complexes in the presence of 6EOPA. The protein pattern was altered and the level of kir2.x was decreased compared to controls. These results highlight the physiological role of kir2.1 ion channel complexes together with Sap97. The associated complex structure of kir2.1 ion channels with Sap97 protein is essential for maintaining the normal physiological function of inward rectifier currents contributing to normal potassium ion homeostasis in muscle contraction.

Key words: ophiobolins, Kir2.1 potassium ion channel, chicken muscle cells

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