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Contribution of Ryanodine Receptors in Forming Presynaptic Ca^{2+} Level and Cholinergic Modulation in Response to Single Potential in Frog Neuromuscular Junction

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Abstract

© 2016, Springer Science+Business Media New York.Ca2+ entering through voltage-gated Ca2+ channels plays a key role in the initiation of neurotransmitter secretion. However, intracellular Ca2+ storages such as endoplasmic reticulum (ER) can also contribute in the presynaptic Ca2+ level forming. Also ryanodine-dependent Ca2+-induced Ca2+ channels of endoplasmic reticulum may contribute in secretion inhibiting action of cholinomimetics. In this work, we use a photometric method for estimating the relative change in the level of presynaptic Ca2+ ions (Ca2+ transient). We have shown that during low-frequency stimulation Ca2+ release from the ER is involved in forming of presynaptic Ca2+ level. And more likely those effects of the cholinomimetics on Ca2+ transient are not related to Ca2+ release from the endoplasmic reticulum.

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Keywords

Ca transient 2+, Calcium, Frog, Neuromuscular junction, Ryanodine, Ryanodine receptors, Synapse

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