

Caffeine Induced Ca-release Dependence on the Bound Ca on the Outersurface Membrane of the Sarcoplasmic Reticulum Skeletal Muscle

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Abstract

It is known that the Ca release channels/RyR binding sites of skeletal muscle sarcoplasmic reticulum is modulated by caffeine. Caffeine potentiates Ca sensitivity in the Ca induced Ca release (CICR) channels. The aim of this experiment was to investigate whether Ca uptake in the FSR and Ca release from the FSR were changed by the bound Ca on the outer surface of the FSR membrane. When FSR was treated with low concentrations of caffeine, Ca release from the FSR was activated and the Ca bound on the outer surface membrane of the FSR was suppressed. However, when FSR was treated with low concentrations of procaine, Ca release from the FSR by caffeine was inhibited. Also, the Ca bound on the outer surface membrane of procaine treated FSR was not suppressed by caffeine and EGTA. It was suggested that the Ca release sites/RyR binding sites were accelerated with the increases of the stored Ca²⁺ and the bound Ca on the outer surface membrane of the SR, and that the inhibition of CICR by procaine was induced by the lock of the bound Ca on the outer surface membrane of the SR.
