

Calcium release modulated by inositol trisphosphate in ruptured fibers from frog skeletal muscle

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To investigate the effect of inositol 1,4,5-trisphosphate on calcium release, we used fiber bundles of frog sartorius muscle mechanically permeabilized by a scratching procedure, and we detected increments in calcium concentration by measuring aequorin light signals. Submicromolar concentrations of inositol 1,4,5-trisphosphate induced fast calcium-release signals, with a half time to peak of 60 ms or less. Similar responses were elicited by caffeine. The calcium-release signal induced by inositol 1,4,5-trisphosphate occurred at pCa values of 7 or lower, and the dose-response curve depended on the ionic composition of the incubation solution. Lower inositol 1,4,5-trisphosphate concentrations were needed to induce release when incubation solutions of ionic composition expected to depolarize the transverse tubule membrane were used. Inositol 1,4,5-trisphosphate was more effective than inositol 1,3,4-trisphosphate, inositol 1,4,5,6-tetrakisphosphate, and inositol 1,4-bisphosphate. The effe