Phospholipase C activity in membranes and a soluble fraction isolated from frog skeletal muscle

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Highly purified triads and transverse tubules, as well as a soluble fraction isolated from frog skeletal muscle, hydrolyze exogenous phosphatidylinositol 4,5-bisphosphate forming inositol 1,4,5-trisphosphate with maximal rates in the range 0.5-1 nmol/mg per min at pCa 3. Sarcoplasmic reticulum membranes present a minor activity. The hydrolysis rates in triads were 0.072 ± 0.015 nmol/mg per min at pCa 7, increasing to 0.263 ± 0.026 nmol/mg per min at pCa 5 with 1.0 mM Mg and 0.1 mM substrate. The phospholipase C activity of isolated transverse tubules at pCa 3 was 0.570 ± 0.032 nmol/mg per min. Since triads contain 10% transverse tubules, and correcting for the small contribution of sarcoplasmic reticulum, the calculated phospholipase C activity of transverse tubules at pCa 3 is about 10-times higher than the observed values, suggesting loss of activity during isolation. The activation by calcium was also observed in a soluble fraction and was neither replaced nor inhibited by magnesium