Role of lipids in sarcoplasmic reticulum: A higher lipid content is required to sustain phosphoenzyme decomposition than phosphoenzyme formation

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Enzyme preparations with variable phospholipid contents were obtained by removing lipids from sarcoplasmic reticulum with deoxycholate. Preparations containing from 90 to 37 phospholipids per enzyme showed normal values of both Ca2+-ATPase activity and steady-state phosphoenzyme levels. Fractions containing 37 to 23 phospholipids per enzyme had a reduced ATPase activity but normal phosphoenzyme levels, showing that in this range of lipid content the ATPase reaction is inhibited in a reaction step subsequent to phosphoenzyme formation but prior to phosphoenzyme decomposition. Delipidation below 23 lipids per enzyme caused a marked reduction of the amount of phosphoenzyme formed, so that although both reactions require lipids, fewer lipids are required for phosphoenzyme formation than for decomposition. The effect of lipid removal could be completely reversed by readdition of lipids to fractions containing more than 11 lipids per enzyme. It is proposed that phosphoenzyme formation requir