

Protons induce calsequestrin conformational changes

Hidalgo, Cecilia

Donoso, Paulina

Rodriguez, Patricio H.

Calsequestrin, a high-capacity, intermediate-affinity, calcium-binding protein present in the lumen of sarcoplasmic reticulum, undergoes extensive calcium-induced conformational changes at neutral pH that cause distinct intrinsic fluorescence changes. The results reported in this work indicate that pH has a marked effect on these calcium-induced intrinsic fluorescence changes, as well as on calorimetric changes produced by the addition of Ca^{2+} to calsequestrin. The addition of Ca^{2+} at neutral pH produced a marked and cooperative increase in calsequestrin intrinsic fluorescence. In contrast, at pH 6.0 calsequestrin's intrinsic fluorescence was not affected by the addition of Ca^{2+} , and the same intrinsic fluorescence as that measured in millimolar calcium at neutral pH was obtained. The magnitude and the cooperativity of the calcium-induced intrinsic fluorescence changes decreased as either $[\text{H}^+]$ or $[\text{K}^+]$ increased. The evolution of heat production, determined by microcalorimetry, observed