

ENERGY INTERCONVERSION CATALYZED BY SERCA1 FROM BLUE MARLIN HEATER ORGAN: REGULATION BY KCl

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Although most fish are ectothermic, the ability to elevate body temperature by internal heat generation (endothermy) has been documented in billfish due to the presence of a unique tissue called heater organ. Derived from eye skeletal muscle, this tissue does not express contractile filaments and up regulate all the sarcoplasmic reticulum (SR) proteins involved in Ca^{2+} mobilization. The sarco/endoplasmic reticulum Ca^{2+} -ATPase (SERCA) is able to interconvert different forms of energy. Part of the chemical energy released during ATP hydrolysis is used to transport Ca^{2+} from the cytosol into the SR lumen and the other part is dissipated as heat. The aim of this work is to investigate the energy interconversion catalyzed by SERCA1 from blue marlin (*Makaira nigricans*) heater organ. Using differential centrifugation we isolated vesicles derived from the SR enriched in SERCA1. Our results show that the rate of Ca^{2+} uptake and ATP hydrolysis catalyzed by SERCA1 at 25°C, increases almost 2.0 and 3.0 times, respectively, after the addition of 100mM KCl. On the other hand, KCl inhibits the rate of heat production, decreasing the ΔH^{cal} from -24 to -14 kcal/mol. These results suggest that KCl might be regulating the process of energy interconversion catalyzed by SERCA1 from blue marlin heater organ. Supported by NSF and FAPERJ.