

TEMPERATURE-DEPENDENCE OF Ca²⁺ TRANSPORT CATALYZED BY SERCA2 IN RAINBOW TROUT AND RAT VENTRICLES

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Different from mammals, in fish heart, most of the Ca²⁺ comes from the extracellular medium rather than intracellular compartments, thus the activity of the cardiac sarco/endoplasmic reticulum Ca²⁺-ATPase (SERCA2) is practically inexistent. However, recent studies, in high metabolic fish like tunas and cold active fish like burbot and trout, showed a significant decrease in the cardiac force contraction, after the addition of ryanodine, a specific SR channel inhibitor. Here we show that vesicles derived from rainbow trout (*Salmo gairdneri*) ventricles retain a SERCA pump that is able to transport Ca²⁺ at the expense of ATP hydrolysis. Ca²⁺ transport measurements as a function of the temperature showed that different from the well known mammal isoform, the SERCA2 from trout hearts didn't display high temperature dependence, being elevated at low and high temperatures, until 30°C. More than that, compared with mammal SERCA2, at lower temperatures, the trout SERCA2 presented a higher rate of Ca²⁺-uptake. However, while the activity of the trout SERCA2 is maximal at 25°C, the rat SERCA2 activity continuously increases until 35°C. These results suggest that the SR from trout ventricles can play an important role retaining cardiac function at cold temperatures. Supported by NSF and FAPERJ.