# SERCA2 PUMP EXPRESSION AND PHOSPHORILATED PHOSPHOLAMBAN IN MECHANICAL-INDUCED VENTRICULAR HYPERTROPHY IN RATS

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Alterations in SarcoEndoplasmic-$Ca^{2+}$-ATPase (SERCA2) activity and in phospholamban (PLB) expression have been implicated as important determinants in the deteriorated function of the failing heart (1). In fact, several studies demonstrated that impairment in PLB expression (2), in SERCA2/PLB ratio or in basal level of PLB phosphorylation (3) are all related to dysfunctional $Ca^{2+}$ homeostasis that occurs in congestive heart failure (4) and are involved in the transition from the compensated hypertrophic state to early congestive heart failure.
In this study we investigated the time course of the expression of SERCA2 and PLB in a rat model of left ventricular hypertrophy induced by transverse aortic stenosis (TAC group). At 14, 28, 42 or 56 days after surgery animals were sacrificed, the left ventricle was separated, weighted and homogenated for Western blot. Since the inhibitory activity of PLB is related to its phosphorylated state, we analyzed also the expression of calcium/calmodulin-dependent protein kinase II, which phosphorylates PLB in Thr17.
SERCA2 expression was significantly ($P<0.005$) higher in the left ventricles of TAC rats at any experimental times, while no significant differences in PLB expression, either monomeric and pentameric form, between the two groups were observed. The SERCA2/PLBm ratio in TAC rats did not change in the time up to 42 days, in contrast, at 56 days this ratio was significantly ($P<0.05$) higher than SHAM rats. Furthermore, the expression of PLB phosphorylated at Thr17 was significantly ($P<0.05$) higher in TAC rats at 42 and 56 days compared to SHAM rats and we can observed a trend to increase in CaMkII expression in TAC group at the same experimental time.
In conclusion, these preliminary data let us to hypothesize that the enhanced expression of SERCA2 and subsequently the increased phosphorylation of PLB by CaMkII could be adaptative reactions to reduce an excess of free $[Ca^{2+}]i$ due to the pressure overload. Further studies need to characterize the role of SERCA2 and PLB in ventricular hypertrophy by compensatory state and by congestive heart failure

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