E115 Effect of Prior Heat Treatments on Heat-induced Inhibition of Steroidogenesis in MA-10 Leydig Tumor Cells

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The heat shock severely impairs the ability of steroidogenic cells to synthesize steroids. The antisteroidogenic effects of heat shock treatment may be due mainly to the acute inhibition of Steroidogenic Acute Regulatory(StAR) protein synthesis. We investigated the effects of heat shock or prior heat treatments on StAR and HSP70 synthesis in MA-10 mouse leydig tumor cells. MA-10 cells preheated for 10min at 42℃ were allowed to recover at 37℃ for the required period. Then, the cells were subjected again to 42℃ heat treatments for 10min, and then kept at 37℃ for 1 - 8 hrs. Heat shock regimen acutely inhibited StAR gene expression in MA-10 cells induced by LH and cAMP analog stimulation. Prior heat shock treatments reduced heat-induced inhibitory effect on StAR gene expression in MA-10 cells. Under the heat shock treatments the expression level of HSP70 mRNA increased dramatically. The prior heat shock had the same upward tendency in the expression, however, the level was definitely decreased in comparison with heat shock condition. The results suggest that prior heat treatments increased the resistance to heat and protected its steroidogenic activity against the heat shock in MA-10 cells.

E116 Circadian Variations of Blood Pressure, Heart Rate, and Plasma Melatonin during the Shift of Sleep-Wake Cycle in Adult Men.

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To determinate the effect of the change of sleep-wake cycle on the human physiological daily rhythms, the blood pressures, heart rates, and plasma melatonin levels were measured in 4 males of 20-22 years old. The melatonin rhythms were maintained in the 4 subjects imposed to a new sleep (sleep time: 0900-1700) cycle and the clear phase shift was observed on day 3. The high levels of melatonin during the night time were reduced on change the sleep-wake period. Blood pressure and heart rate were high during the waking period and low during sleeping period. The systolic blood pressure and heart rate during waking period were a little lower than control condition on day 2 of sleep-wake change and thereafter those levels were restored to the normal values. The sustained high melatonin levels during night wake period might reduced blood pressure and heart rate in some degree.

These results indicate that the sleep-wake state are the major factors that affect both the circadian profiles and the variability in blood pressure and heart rate, and circadian variations of blood pressure and heart rate are also influenced by the internal biological clock.