**P-25** Influence of different temperature stimuli on muscle regeneration after bupivacaine injection to rat skeletal muscles

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**Purpose:** This study investigated the influence of heat stress and icing on muscle regeneration after muscle injury.

**Methods:** Bupivacaine (BPVC) was injected into soleus (SOL) muscle of Wistar strain male rats (8-week-old). Immediately after injection, rats underwent heat stress (42°C, 30 min.) or icing (with icepack, 20 min.). Then 1-, 2- and 4-wks, SOL muscles were removed, and the expression of IL-6, myostatin and follistatin contents were assessed by Western blotting.

**Results & Discussion:** Although there were no significant effect of heat stress and icing, SOL muscle weight-to-body weight ratio decreased at the 1-wk after the injection of BPVC, then gradually increased during the subsequent recovery period. IL-6 and follistatin expressions at the 1-wk after the injection were higher than that at 2- and/or 4-wk time points, whereas myostatin expression showed the opposite changes. These changes were remarkably in heat stress. Icing had no effect on the muscle regeneration. Our findings indicate that a single bout of icing and heat stress does not promote muscle regeneration after bupivacaine injection.

**Key Words:** IL-6, Myostatin, Follistatin, Regeneration

**P-26** Voluntary wheel-running exercise suppresses development of type 2 diabetes mellitus

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**Purpose:** The aim of this study was to examine whether voluntary wheel-running (WR) exercise suppresses development of diabetes mellitus (DM) in a model rat OLETF for type 2 DM.

**Methods:** Five-week-old male OLETF rats were housed either in cages equipped with wheels (OLETF-WR) or in standard cages (OLETF-SED) for 1 year. Voluntary WR distance was recorded weekly. Eleven-month-old rats underwent an oral glucose tolerance test (OGTT) and an examination of Hb A1c.

**Results and Discussion:** Total WR distance, albeit showing a big individual difference, was linearly increased throughout the experimental period. There was a negative correlation between total WR distance and body weight. In OLETF-SED, blood glucose (BG) increased after the age of 33 weeks, while BG in OLETF-WR and LETO remained unchanged throughout the experimental period. Although BG, that was increased in an OGTT of OLETF-WR and LETO with normal levels of Hb A1c, returned to normal level 2 hours after glucose administration, BG levels of OLETF-SED with higher levels of Hb A1c remained high for 2 hours. These results show that voluntary WR, that started at 5 weeks of age, completely suppresses DM development in OLETF rats.

**Key words:** OLETF, diabetes, exercise, OGTT