P3PM-1-11
VASOPRESSIN V1A RECEPTOR POLYMORPHISM AND HIGH-INTENSITY INTERVAL WALKING TRAINING EFFECTS IN MIDDLE-AGED AND OLDER PEOPLE
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In this study, we assessed whether C(T)(Phe16Pro) polymorphism of vasopressin V1a receptor altered the indices of life-style associated diseases in middle-aged and older men (68 ±6 (SD) yr) and, if so, whether it also altered the effects of high-intensity interval walking training (IWT) on them. CC (n=21), CT (n=62), and TT (n=21) men participated in IWT, 5 sets of 3 min fast walking at 75% peak aerobic capacity (VO2peak) and 5 min slow walking at 40% VO2peak/day, 24 days/wk, for 5 mos. Before IWT, body mass index (BMI) and diastolic blood pressure (DBP) in WT were 25.0±4.1 (kg/m2) and 87.0±13.9 mmHg, higher than 23.4±10.5 kg/m2 and 70.5±9.0 mmHg in CC, respectively (P<0.05), whereas the differences disappeared after IWT (P=0.1) despite similar training achievement between the groups (P=0.1). After IWT, BMI decreased by 1.0±0.2 kg/m2 and DBP by 5.1±3.1 mmHg, as TT, more than 5.6±0.1 kg/m2 and 1.8±2.3 mmHg in CC, respectively (P=0.05), with greater decreases in blood LDL and total cholesterol in TT than CC (P<0.05). Thus, the CT polymorphism of V1a receptor altered the indices of life-style associated diseases and the effects of IWT on them.

P3PM-1-13
A 'GAIN-OF-FUNCTION' MUTATION IN THE HYPOXIA-INDUCIBLE FACTOR 2a GENE DOES NOT REDUCE EXERCISE CAPACITY IN HUMANS
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The lack of a functional hypoxia-inducible factor (HIF) family of transcription factors regulates the expression of a number of genes relating to metabolism. In the recessive condition of Chuvash Polycythemia (CP), the normal degradation of the HIF family is compromised and these factors are never down-regulated. This results in a severe exercise intolerance due to increased oxygen delivery. We have found that a gain of function mutation of HIF2a, HIF2a Pro504Leu, is also associated with increased exercise intolerance. This is a gain of function mutation and is present in a family with a recessive condition of severe exercise intolerance and polycythemia. We have investigated this mutation in an isolated population of the Chuvash people in rural Russia and found that the mutation is not associated with exercise intolerance.

P3PM-1-15
SLOW-SPEED RUNNING TRAINING MARKEDLY REDUCES SERUM TNF-ALPHA LEVEL IN MIDDLE-AGED AND ELDERLY RUNNERS
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The effects of slow-speed running training on serum adipo- cytokines and C-reactive protein levels were studied. Twenty-six middle-aged and elderly men and females at an age of 46 to 79 years participated as subjects. The subjects ran 1 to 5 times a week for about 1 hour each at slow speed of 7-8 minutes/km for four months. Serum samples were collected on two occasions, one at an introductory stage (July), the other at relatively hard preparatory work stage (November) in the training period preparing for participation to the Honolulu Marathon held in Hawaii. The collected samples were analyzed for leptin, TNF-alpha and C-reactive protein. Anthropometric parameters were also measured. Although the slow speed running training for four months induced no significant change in serum leptin and C-reactive protein concentration it markedly decreased serum TNF-alpha concentration which was statistically highly significant (p<0.001). The decrement of serum TNF-alpha level was accompanied by decreases in body mass and abdominal circumference. The marked decrement of serum TNF-alpha level was suggested to be a reflection of the training-induced improvement in insulin sensitivity.

P3PM-1-12
THE CHANGES IN BODY FLUID CONTENT OF JAPANESE ADULT WITH AGING
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Background: Maintenance of physical fitness in elderly is one of the key public health targets in Japan because of its rapid progression to become ageing society. Decrease of muscular power is attributed to decrease of muscle volume. However, the changes in Japanese muscle volume through their lifetime has not been clarified yet. The aim of this study was to examine the changes in body fluid content that reflects muscle mass in Japanese adults. Material and Methods: 1135 Japanese (573 men, 562 females, aged 15-75 yr) participated in the present study. Body weight (BW), intracellular (ICF) and extracellular (ECF) fluid volumes, arm (AF), trunk (TFV) and leg (LFV) fluid volumes were measured by SMFI analysis. Results: ECFV/BW in both genders was not significantly changed with aging. Males' ICFV/BW was significantly decreased from about 20 yo whereas the decrease in females was observed from about 50 yo. Almost all of changes observed in ECFV/BW, ICFV/BW and TFV/BW was consistent to that of muscle ICFV/BW. Discussion: The results showed that trunk and leg muscle volumes in male were decreased from early stage of life whereas those of female decreased from older ages. This phenomenon is probably induced by low level of daily physical activity.

P3PM-1-14
CHANGING OF OPERATION MEMBRANE Na,K-ATPase OF FAST AND SLOW RAT SKELLETAL MUSCLES AT SIMULATION OF HYPOGRAVITY
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A deep structurally functional reorganization of muscle happens in the conditions of hypogravity. In the present research we studied influence of hindlimb unloading of the rat by method Morey-Holton, allowing to simulate conditions of hypogravity on mechanisms of maintenance of set level of resting membrane potential (RMP) for fast and slow skeletal fibres. Experiments have shown that prolonged hindlimb unloading of rat led to decrease of RMP of fast and slow muscles. At control experiments presence of osmabain or Na-free solution reduced RMP of muscle. Under conditions of hindlimb unloading addition solution with osmabain or Na-free solution also was decreased of RMP. However this decrease of RMP has been less expressed, in comparison with depolarization of intact muscles at the same conditions. The carried out experiment allowed to make conclusion that hindlimb unloading causes decrease of RMP and transition of its parameters to new stationary level in fibres both "fast", and "slow" muscles of mammals. The basic mechanism of such transition of transmembrane potential is loss of electronic component as result of change in quantitative proportion of counter-flow the main potential-forming ions which are carried out at participation of Na,K-ATPase of muscle membrane.

P3PM-1-16
MOVEMENT-STIMULATED HYALURONAN (HA) SECRETION INTO JOINTS IN VIVO IS MEDIANATED BY PHOSPHOLIPASE C AND PARALLEL MAP KINASE PATHWAYS
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Intestinal/glycocalyx permeability, joint lubrication and synovial fluid conservation depend on HA. HA injections and exercise ameliorate osteoarthritis. We therefore studied how movement affects synovial HA secretion rate qHA. In anaesthetised rabbits, knee joints were cycled passively at 0-1.5Hz for 0-9min per 15min for 5h. Newly secreted HA was harvested at 5h for HPLC. qHA increased at a nonlinear function of cycle frequency & duration, almost doubling at 0.5Hz-20% duration (p<0.001, t test, n=35). In static joints similar or larger increases were elicited by Ca2+ ionophore cromakalim, PGE2 & phorbol ester (PKC activator) PKC-mediated stimulation was inhibited by PKC inhibitor, bisindolylmaleimide and by U0126 and PD98059, inhibitors of the PKC downstream effectors MEK-ERK. These agents only inhibited movement-stimulated secretion (MSHA) when co-applied with an inhibitor of the parallel p38 kinase path (SB203580, ineffective alone). Phospholipase C (PLC) inhibitor U73122 almost fully blocked MSHA (p<0.001, n=10), leaving static qHA unchanged. ENaC blocker amiloride inhibited MSHA; CaV3.2 SP600125 didn't. It is proposed that MSHA may be mediated by PLC activation, leading to parallel activation of PKC-MEK-ERK and p38 kinase pathways in vivo.