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LONGEVITY OF TRAINED MICE AND MITOCHONDRIAL ELECTRON TRANSFER

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The performance in behavioural test is considered as an indication of neurological age. The behavioural deficits observed upon ageing could be explained by increased oxidative stress and dysfunctional mitochondria. Animals subjected to moderated training were assayed behavioural performance upon ageing; test began with 13 weeks old mice and they continued until 72 weeks old mice. The test were tightrope successes and exploratory activity in T- maze. Four groups were defined: the lower performance Slow Males and Slow Females, and the higher performance Fast Males and Fast Females. 120 mice (30 of each type) were trained with moderate exercise in treadmill, the exercise beginning with 28 weeks old mice each two weeks during the life of the animals. 120 mice trained and not trained were used for survival determination. Fast Females showed the longest life span and Slow Males the shortest life span. Slow Males trained presented an increment in the life span. Oxidative stress and mitochondrial electron transfer activities were determined in heart and liver of young (28 weeks), adult (52 weeks) and old (72 weeks) mice, trained (n=40) and not trained (n=40), in a cross-sectional study. TBARS content were increased in old animals in heart and liver respectively. TBARS were higher in male than in female, in not trained than in trained, and in slow than in fast mice. Heart and liver mitochondria were analysed for NADH-cytochrome c reductase, succinate-cytochrome c reductase, cytochrome oxidase and citrate synthase activities. Succinate-cytochrome c reductase activities were not modified in both old mice and trained animals. The activities of mitochondrial enzymes, NADH-cytochrome c reductase, cytochrome oxidase and citrate synthase, were decreased in old animals. The females presented higher mitochondrial activities than males. The trained groups presented higher mitochondrial heart activities than not trained groups.

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POLYAMINE AND DIAMINE OXIDASE ACTIVITY IN CERVICAL MUCUS ASSOCIATED WITH PRE-MALIGNANT CHANGES IN THE UTERINE CERVIX

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Objective: To establish whether reactive oxygen species, generated during oxidation of amines, catalysed by polyamine oxidase (PAO) and diamine oxidase (DAO) in cervical secretions may play a role in the aetiology of cervical cancer.
Methods: Cervical mucus was obtained from women attending the gynaecological out-patient department: 139 with and 154 without cytological evidence of cervical intra-epithelial neoplasia (CIN) were recruited The mucus was freeze dried in liquid nitrogen, weighed and later re-suspended for assay of PAO and DAO concentrations using a chemiluminescence method. The two groups were compared by group sequential analysis using PEST3 software.
Results: Patients with a colposcopic diagnosis of a high-grade CIN lesion had significantly higher enzyme activities than control cases (L_NPAO 1.37(0.37) versus 1.18(0.35): Student t-test: $p<0.001$; L_NDAO 1.37(0.36) versus 1.15(0.37): Student t-test: $p<0.001$).
Conclusion: It is probable that this rise in enzyme activity precedes cytological changes, and plays some part in the aetiology of cervical cancer, as the cells that undergo pre-malignant change are normally squamous in origin, whereas mucus is a product of columnar epithelium. Higher enzyme activity in patients with CIN than in controls may be a reflection of higher risk of exposure to amine substrates in semen, through multiple sexual partners.

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GENETIC DETERMINATED DISBALANCE OF ROS – GENERATING AND ROS – ELIMINATING ENZYME SYSTEMS AS KEY FACTOR IN RISE OF OXIDATIVE STRESS, DISEASES AND PHENOPTOSIS.

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Two enzymatic systems, namely: system of xenobiotic metabolizing enzymes (XMEs – superfamilies of CYP, EH, GST etc.) and system of antioxidative enzymes (AOEs - SOD,CAT,GPO) play the most important role in support and regulation of redox and chemical homeostasis of organisms to environmentals. Both XMEs and AOEs have been found to undergo numerous polymorphisms on genetic and phenotypic levels and it can lead to rise of oxidative stress, diverse diseases and to premature death (an other words – to phenoptosis). Variable combinations only in XME polymorphic variants in different individuals can lead to 30-40-fold differences in activation and degradation of xenobiotics and as result – to great individual differences in risk of toxicity, cancer and other pathologies. Here we present the data about elaboration of so call Provisional Criterion of Protective Metabolic Status (PCPMS) of organisms. For these purposes the phenotypic interline differences in activities of liver 10 XMEs and AOEs in 8 mouse lines have been investigated. Using PCPMS we have been obtained a good correlation with physiological characteristics of animals. Taking into account physiological and biochemical meaning of PCPMS, one could suggest, that organisms with PCPMS < 1 must be unstable, with high susceptibility to various diseases. On the other hand, the organisms with PCPMS > 1 have to be more resistant to toxicity and to risk of diseases. Indeed, PCPMS for CBA mice equal 0.25 and these animals in accordance with Jackson's Laboratory Database have very high per cent of spontaneous tumors of differ localization. On the contrary,