



Physiology 2016

Abstracts

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Ethical requirements

Experiments on animals or animal tissue

For work conducted in the UK all procedures must conform with current UK legislation. For work conducted elsewhere all procedures must accord with current national guidelines or, in their absence, with current local guidelines.

Experiments on humans or human tissue

All procedures must accord with the ethical standards of the relevant national, institutional or other body responsible for human research and experimentation, and with the principles of the World Medical Association's Declaration of Helsinki.

D'Souza A, Bucchi A, Johnsen AB, Logantha SJ, Monfredi O, Yanni J, Prehar S, Hart G, Cartwright E, Wisloff U, Dobryznski H, DiFrancesco D, Morris GM, Boyett MR.

Nat Commun. 2014 May 13;5:3775. doi: 10.1038/ncomms4775.

Where applicable, the authors confirm that the experiments described here conform with the Physiological Society ethical requirements.

PCA171

The role of miR-378 in sarcopenia

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Sarcopenia is the loss of muscle mass and function with age and it affects all individuals from approximately the 4th decade of life. The mechanisms behind sarcopenia are unclear, however they are likely to be multifactorial. MicroRNAs (miRNAs, miRs) are small non-coding RNAs that post-transcriptionally regulate gene expression. microRNAs have been shown to be play key roles in muscle development and disease. We and others demonstrated a decrease in miR-378 expression in muscle during ageing in both rodents and humans. We manipulated the expression and function of microRNA-378 in muscle of mice using microRNA mimic and antagomiR delivered via tail vein injection. Inhibition of miR-378 expression resulted in decreased muscle mass/myofibre size and function (force generation). In contrast, overexpression of miR-378 resulted in an increased muscle mass, myofibre size and function in both adult and old mice. These data suggest miR-378 plays a role in sarcopenia and may be a potential therapeutic target against sarcopenia. Further work will focus on the validation on targets of miR-378.

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PCA172

The studying of colors' influence on internal time flow speed and adaptive opportunities of the organism

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Internal time flow speed (IT) of a human is an important factor that reflects the ratio of the basic processes in the CNS. The aim of the research was to study the dependence of the IT flow speed on colors. Materials and methods. With the help of a specially developed computer program the assessment of the individual minute duration (IMD) was performed, using. During the process of a time countdown the testees were looking at the screen of the display with the set color. The research was conducted in the conditions of common blackout in order to create light and color dominance of glowing screen of the display. 48 students with an accelerated IT flow who have volunteered to take part in the experiment were studied. Each of them carried a series of 10 measurements

for every time of the main background colors (red, orange, yellow, green, blue, dark blue, purple).

Results and its discussion. The findings indicate that the color significantly affects the IT flow speed. The most significant changes are observed under the impact of extreme spectral colors: red and blue-purple. Red color caused much more acceleration of IT, purple color, on the contrary, caused its slowdown. Green and related to it medial spectral colors caused less significant multidirectional and unreliable changes of the IT flow speed.

The findings show that the most distinct positive effect on the IT flow speed was done by dark blue and especially purple colors. It was found that the determination of the IMD in terms of using dark blue and purple colors of 10 minutes duration is accompanied by the improvement of the IT flow speed and other studying indicators. The duration of physical activity was increased to 2.5 min in average, along with this the more adequate reaction of the cardiovascular and respiratory systems to physical activity was observed. The recovery of deviation indicators in restorative period flew faster. These data indicate to decreasing of the "value" of adaptation.

At the assessment of intellectual productivity evaluation it was found that purple color reduces the number of errors that the students made while having the correction test. The decreasing of anxiety and frustration of mental status under the influence of purple color is determined. Under the influence of red color of background there is a clear increase of the IT flow speed, the clear prevalence of the excitation process over inhibition one. The result of these changes was reducing the physical and intellectual productivity, increasing of aggressiveness and anxiousness, the rapid worsening of the vegetative indices.

Conclusions. Thus, the color is a factor that significantly affects the IT flow speed and the condition of the main processes in the CNS. It allows suggesting that certain colors can be used as artificial modulators of IT speed of a human to optimize its adaptive opportunities.

Teslenko I.I. Color effects of the speed current of internal time / I.I. Teslenko, O.V. Vasylieva // 7th International Scientific Interdisciplinary Congress for medical students and young doctors (15-16 May, 2014): Abstract book. – Kharkiv: KNMU, 2014. – P. 54-55.

Where applicable, the authors confirm that the experiments described here conform with the Physiological Society ethical requirements.

PCA173

Exercise-induced plasma steroid hormone responses in men: the development of a new tool to highlight hormonal alterations during overreaching to reduce the incidence of the overtraining syndrome

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Athletes commonly progressively overload the body to improve physical performance, however, this can lead to detrimental states of overreaching – functional (FOR) or non-functional (NFOR) - or the overtraining syndrome (OTS). Recovery from these states may take weeks to years (Meeusen et al., 2013). Exercise-induced responses of salivary testosterone

