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**ФІЗІОЛОГІЯ – МЕДИЦИНИ, ФАРМАЦІЇ ТА ПЕДАГОГІЦІ:
АКТУАЛЬНІ ПРОБЛЕМИ ТА СУЧАСНІ ДОСЯГНЕННЯ**

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Zlenko V.V., Sokol E.N., Kovalyov M.M., Hloba A.A.
**PSYCHOPHYSIOLOGICAL PECULIARITIES OF ADAPTATION
TO ELECTROMAGNETIC RADIATION OF RADIOFREQUENCY WAVE BAND
IN PEOPLE WITH DIFFERENT TYPES OF AUTONOMIC REGULATION**

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The aim of research was to study the psychophysiological peculiarities of human organism's adaptation to chronic influence of electromagnetic radiation of radiofrequency wave band (EMR RWB). Complex experimental examination of students of Kharkiv National Medical University aged 17–20 from general health group was done. All examined people gave their voluntary consent for participation in research. Anxiety level and psychophysiological state of personality was determined using Spielberg-Hanin scale, efficiency of general adaptive reaction was evaluated by calculation of indexes of Kerdo and Hildebrandt.

Formation of experimental groups in 1st stage of research was based on evaluation of training dynamics of intellectual workability with aim of minimization of informational stressor influence on medical students during first years of studies in medical university. Research of efficiency of general adaptive reaction revealed that in young healthy people there is no significant prevalence of sympathetic or parasympathetic tone both in state of rest and in response to functional tests. Based on results of 1st stage of the experiment a group of students that systematically maintained their professional knowledge on the level sufficient for execution of program tasks of study was determined. They showed reliable tendency of increase of mental labor efficiency and decrease of psycho-emotional stress under intellectual and physical loads. For most of students of that group (84,7 %) general adaptive reaction of the organism to prolonged influence of informational stressor was determined as adaptive training reaction.

That group of students took part in second, main stage of the experiment, in which the psychophysiological peculiarities of adaptation to chronic influence of EMR RWB in people with different types of autonomic regulation of organism's visceral functions was studied. Based on results of the questionnaire, those students were divided into 3 groups depending on duration of daily exposure to EMR RWB. Results showed that I group (18,9 % with daily exposure to EMR RWB more than 2 hours) mainly consisted of students with parasympathetic type of autonomic regulation of visceral functions – 67,3 %, medium level of anxiety – 45,9 % and lowered parameters of psychic tempo and intellectual workability efficiency – 51,4 %. II group (60,7 % with exposure duration from 20 min to 2 h) included mainly students with sympathetic type of autonomic regulation – 59,8 %, high anxiety level – 39,7 % and medium indexes of psychic tempo and intellectual workability efficiency – 72,4 %. III group (20,4 % with exposure duration less than 20 min) consisted of students with normal type of autonomic regulation – 83,7 %, low level of anxiety – 37,3 % and high parameters of psychic tempo and intellectual efficiency – 89,4 %.

Results of the experiment allowed proving of scientific literature about prevalence of energetic or informational interaction of EMR with elements of biological system depending on exposure duration to EMR RWB. Single and short-term EMR RWB influence causes the development of non-specific adaptive reaction to irritant of weak type. Significant stress of psychophysiological adaptation mechanisms was revealed in group of students with EMR RWB exposure longer than 2 hours that allowed considering multiply talking cell phone subscribers among group of risk of asthenic or asthenic-autonomic syndrome of radiofrequency disease development. EMR RWB significantly changes the character and strength of response reaction of irradiated organism leading to strain of regulatory mechanisms even due to medium-term (20 min to 2 hours) daily exposure to EMR RWB. Individual psychophysiological state of personality and features of autonomic regulation reactivity may insignificantly increase or decrease adaptation efficiency to EMR RWB. Therefore, weakening of non-specific resistance of radiation-exposed organism increases the "price" of adaptation to natural environmental factors.

Student V.
**STUDY OF BIODISTRIBUTION OF MAGNETIC NANOPARTICLES
IN RAT MODEL *EX VIVO* USING ATOMIC-FORCE MICROSCOPY**

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Introduction. The biocompatibility of magnetic nanoparticles (MNP) is the foremost important requirement for safe clinical use. The biodistribution and clearance of MNP studied real time with Magnetic Resonance Imaging (MRI) is essential to ensure biomedical applications [1]. The aim of our study was to