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THE 6TH DKMT MEETING ON AMBIENTAL AND ENVIRONMENTAL MEDICINE – ABSTRACTS

We are together at the 6th DKMT meeting on Ambiental and Environmental Medicine, continuing the tradition established five years ago.
The first DKMT meeting took place in Arad-Romania in 1999, bringing together specialists from Hungary, Serbia and Romania, and has continued in Szeged – on two occasions – in Petrosani last year, in Novi Sad – Serbia and Montenegro.
This meeting is organized by the University of Agricultural and Veterinary Medicine of Banat, Western University "Vasile Goldis" Arad and the University of Medicine and Pharmacy "Victor Babes" Timisoara, under the patronage of Timisoara Branch of the Romanian Academy and Timisoara County Council.
The environmental problems related to human health are some of the main problems of the present and the future and are approached through the interdisciplinary work teams coming from various specialties related to the environmental and medical sciences.
Besides the traditional topics, like man-made chemicals or natural pollution, human ecology, new territories will be approached, like medical geology and its applications to human health, and environmental damage assessment and remediation.
I am hopeful that this meeting debate modern theories and methods and offer new perspectives on current research in this field, for the benefit and the future sustainability of our civilization.

2. THE EFFECTS OF CALCIUM CHANNEL BLOCKERS ON MEPIVACAINE CARDIOTOXICITY IN RATS

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ABSTRACT
The aim of the study was to determine the effects of calcium channel blockers (verapamil, nimodipine) on mepivacaine cardio toxicity on rat ECG in vivo. 18 male Wistar rats were randomized distributed in 3 groups: a control group (mepivacaine) and two study groups which received a pre-treatment with calcium blockers (verapamil, nimodipine), 15 minutes before mepivacaine. The association mepivacaine-verapamil significantly shortened PR interval, insignificantly increased others ECG parameters and produced premature ventricular beats in 25% rats. The association mepivacaine-nimodipine had a negative chronotropic effect. Nimodipine might increase mepivacaine cardio toxicity, but it is also possible that some premature ventricular beats to appear as a negative chronotropic effect of nimodipine.

Key words: mepivacaine, interactions, verapamil, nimodipine, heart, rat.

3. MARKOV CHAINS FOR BIOLOGICAL SEQUENCE ANALYSIS

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ABSTRACT
Many problems in biological sequence analysis have the same structure: based on a sequence of symbols from some alphabet, find out what the sequence represents. For proteins, the sequence consists of symbols from the alphabet of 20 amino acids, and we typically want to know which protein family a given sequence belongs to. The model of coding DNA is always probabilistic, allowing computing the probability of DNA sequence, considering that the sequence is coding. In medical practice, the values (scores) of a given coding statistic in a query sequence can be computed in a number of different ways.
In this paper we try to present the classical Markov chain of first and high order and its application for CpG islands.

Key words: Markov chains, transition probabilities, Markov models, DNA sequence, CpG islands.

4. THE INTERACTION BETWEEN EPITHELIUM AND MESENCHYME IN PULMONARY ONTOGENESIS

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ABSTRACT
The lung is a composite of endodermal and mesodermal tissues. The endoderm of the lung bud gives rise to the mucosal, lining of the bronchi and to the epithelial cells of the alveoli. The vasculature of the lung and the muscle and cartilage supporting the bronchi are derived from mesoderm. Four stages of prenatal human lung development (ontogenesis) have been described on the appearance of the lung. There is a close relationship of the blood vessels and the airways during lung development.
Abnormalities in fetal lung development affect both the airways and the blood vessels.
The development (division) of the airways is influenced by growth factors produced in the mesenchyme, acting on the receptors in the epithelium.

Key words: pulmonary anomalies, branching morphogenesis, lung growth.

5. THE ROLE OF ANKLE-BRACHIAL INDEX IN DIAGNOSIS OF PERIPHERAL ARTERIAL DISEASE

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ABSTRACT
Peripheral arterial disease (PAD) is a leading cause of morbidity as a result of ambulatory dysfunction associated with intermittent claudication. Intermittent claudication affects 5% of the older than 55 years, thereby limiting daily physical activities and negatively affecting quality of life in many older adults. The population with PAD is at increased risk for cardiovascular morbidity and mortality. This increased risk observed in both patients with claudication symptoms and those who are asymptomatic. Measurement of the ratio of the ankle to brachial systolic pressure (ABI) is widely used in clinical and epidemiologic studies to determine the extent of atheroma in the lower limb.

Key words: ration ankle to brachial systolic pressure (ABI), peripheral arterial disease, and atherosclerosis.

6. A PREDICTION OF TOP ATHLETIC PERFORMANCE

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ABSTRACT
The limiting factors of the top athletic performance and the psycho-physiological mechanisms involved remain controversial. The aim of this study was to outline the prediction of the world records (WR) to 2010 for some athletic track and field events.
The prediction has been performed by means of a computer assisted mathematical model. In short, polynomes that could best approximate WR reached in the last decennials have been asserted over the period to 2010.
For 100 m dash the forecast is 9.77 seconds for men (M) and 10.09 seconds for women (W). For 1500 m run, these values are 3:22.33 minutes (M) and 3:48.92 (W). For shot put levels are 25.25 m and 23.32 m, respectively. For high jump the level is 2.54 m (M) and for long jump we advanced 8.39 m (W). The predicted values point to improvement of the WR by a percentage between 10.2 and 10.3 depending on event and gender.

Key words: athletic world records, mathematical model, psycho-physiological mechanisms, limiting factors, doping.

7. THE DYNAMICS OF THE MAGNESIUM FROM SERUM AND FROM ERYTHROCYTES IN PHYSICAL EFFORT

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ABSTRACT
The modifications of the extra- and intracellular magnesium are implicated in physiological and pathological processes, some of them with a big importance in clinical practice.
The extremely various physiology of the physical effort involves vascular, respiratory, metabolic and cellular modifications in which the magnesium is drawn up beside the calcium, sodium and potassium ions.
Magnesium is an antagonistic ion of calcium, an anti-stress ion and a motor vasoadjuster. The magnesium resources of the organism are more faithfully reflected by the intracellular space, the serum magnesium representing 1% from the magnesium capital of the organism.
This study focused on the distribution of the magnesium in the serum compartment and in erythrocytes (intracellular compartment) in animals – adult male Wistar rats breed, 180-200 g weight – put on the physical effort (swimming with resistance through determinable weights, attached to the subject, 30 minutes/day, for 3 days). Groups consisting of 12 animals were selected for this study. The control group comprises 12 rats, Wistar breed, 180-200 g weight, which were not under physical effort.
There were measured the main cations from the serum (Mg^{++}, Ca^{++}, Na^{+}, K^{+}) using the Beckman Cx10 and the magnesium from the erythrocytes was measured from the blood taken on heparin – through the Man Yoe method. It was made evident, from the analysis of the obtained results, a significantly decrease of the magnesium from the erythrocytes and an increase of serum magnesium in animals which were put on the physical effort, by comparison with the control group. There were not made evident the modifications of Ca^{++}, Na^{+}, K^{+} from the serum by comparison with the control group. The results of our study are also confirmed by the information from literature, which shows that the physical effort in non-trained subjects determines the changes in the distribution of extra- and intracellular magnesium.

Key words: physical effort, erythrocyte magnesium, serum magnesium, serum cations.

8. THE 80TH ANNIVERSARY OF PROFESSOR ION HAULICA

M Sabau

Professor Ion Haulica from the University of Medicine and Pharmacy "Gr. T. Popa" Iasi, member of the Romanian Academy, Doctor Honoris Causa, outstanding researcher celebrated on the 29th of October his 80th anniversary.
I had the privilege to meet him at the beginning of 1964 when, being a tutor, I encountered him in the Laboratory of Experimental Physiology at the "D. Danielopolu" Institute of Normal and Pathological Physiology in Bucharest, which was led at that time by Gr. Benetato, and I am proud to celebrate him after four decades.
His entire scientific and pedagogical activity was dedicated to Physiology, that part of medicine called "the science of life". Professor Ion Haulica proved to be an extraordinary mind, characterized by the intuition in approaching the experiments, the eagerness to finish them, by the enthusiasm he talked about the results he obtained, by the clearness to choose his partners and by the exigency he cherished them, no matter where he worked. Professor Haulica's great personality was able to fully manifest in Iasi, the city where he studied medicine, where he began his activity, and from which his soul never really parted. Generous person, of exemplar rightness, he conducted himself in life by the moral principles of the highest values, in a world less and less willing to respect them. Everything he did in life was done with great pleasure, being convinced that he likes Physiology, "a hard science that doesn't offer any material perspective because Physiology doesn't enrich anybody", as the former Ministry of Culture said. He has great heart and communication ability out of limits. No one has left from him without a good piece of advice, without a word of appreciation meant to help him, without a smile of encouragement.

Educated in the spirit of Romanian old university traditions, he has a great contribution in training other generations of good doctors and researchers to continue his work. Actually, Iasi being today the center of Romanian Physiology is entirely due to Professor Ion Haulica, who supported the medical process in Iasi, as a University teacher, Dean or Pro-Rector. He taught everybody in the old fashion, with great respect and high moral values.

In more than 50 years of scientific activity, he largely contributed to research in the field of physiology, approaching a large variety of original physiological themes. He has researches about vegetative functions, the functional biochemistry of the brain, the rennin-angiotensin system, the neuroendocrine modulation of the stress, the neuroimmune bases of pain and analgesia, the functional implications of free radicals and endogenous anti-oxidants, the role of endothelium and the nitric oxide in vascular reactivity.

A large part of the results of his experimental researches were confirmed and quoted by different authors in Romania and abroad. Among his well-researchers are: the discovery of rennin-angiotensin system in hypophysis and pineal gland in mammals and humans, the identification and the description of the role of nervous and purinergic fibers from the myenteric plexus, spinal ganglions, spinal cord and other places in central nervous system. He published over 300 papers in national or international journals and communicated the results of his work at different scientific manifestations. He elaborated, as first author, or in collaboration with other scientists, many physiology treaties and monographs regarding human physiology, some of them awarded by the Romanian Academy. The volume Human Physiology has already been published in many editions and is the most appreciated and complete volume which was published in Romania.

Professor Ion Haulica also trained himself in Europe and USA centers where he finalized his physiological theories and exchang experience with other scientists, and he organized in our country scientific manifestations with international participation.

He is a member of many scientific organizations from Romania and abroad, he is the vice-president of the Academy of Medical Sciences, member of Romanian Academy, Doctor Honoris Causa of the Universities of Medicine in targu Mures, Constanta and he was the president of the Romanian Society of Physiological Sciences. He is still a respected member of intellectual community in the city of Iasi, an active participant at its academic life. Restless and passionate researcher, he continues his activity with great enthusiasm in the laboratory of Experimental Physiology subordinate to the Iasi Branch of Romanian Academy.

In the name of the Romanian Society of Physiological Sciences, on behalf of all its members, I wish Professor Ion Haulica, on this special occasion, to have a long healthy life and to always remain the same man who dedicated his life to a belief of work and honesty.

Professor Marius Sabau
University of Medicine and Pharmacy Targu Mures
President of the Romanian Society of Physiological Sciences