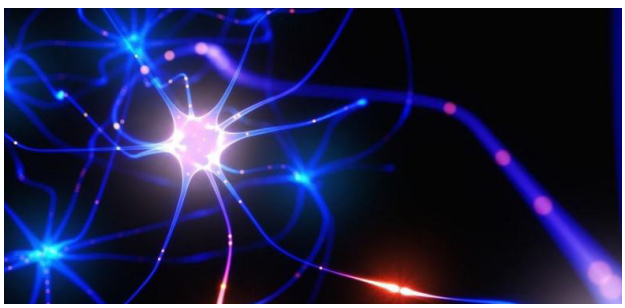
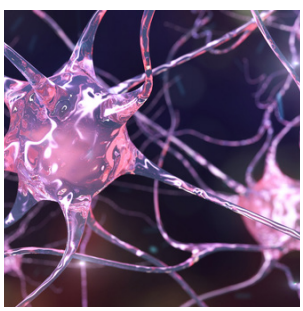
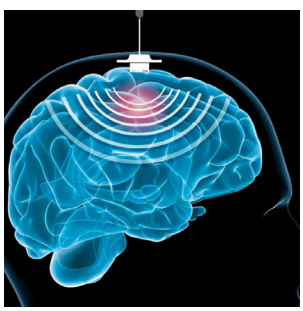
Keynote Forum
September 27, 2021

Parkinson's 2021

3rd International conference on
Parkinson's, Huntington's and Movement Disorders

September 27, 2021 | Webinar

Michael Ugrumov

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Advanced approaches to the development of preclinical diagnosis of Parkinson's disease

The low efficiency of current symptomatic therapy of Parkinson's disease (PD) is explained by the late diagnosis and the onset of treatment of the disease. However, attempts to develop a preclinical diagnosis of PD, mainly by searching for biomarkers such as changes in biological fluids and non-motor functions, did not lead to the development of a technology recommended for clinical use. A drawback of this methodology is searching biomarkers in patients at the clinical stage, although there is no guarantee that they are characteristic for preclinical stage. Indeed, all biomarkers identified so far are nonspecific. We upgraded this methodology, considering as preclinical biomarkers only those changes in body fluids, which are found both in untreated patients and in animal models of clinical (symptomatic) and preclinical (presymptomatic) stages of PD. We believe that detection of the same biomarker in patients and symptomatic animals indicates an adequate reproduction of pathogenesis along this metabolic pathway, and its detection in presymptomatic animals suggests its specificity for preclinical stage. We showed that only a small part of the changes found in blood and tears in PD patients are characteristic of symptomatic and presymptomatic MPTP-treated mice, and they can serve as preclinical diagnostic biomarkers. In addition, we developed a fundamentally new approach to the early diagnosis of PD, a provocative test, by treating presymptomatic mice with α-methyl-p-tyrosine, a reversible inhibitor of dopamine synthesis. Systemic administration of this inhibitor in a preselected dose leads to a reversible decrease in dopamine level in the striatum up to the threshold (30%), resulting in short-term motor disorders. In control, although the dopamine level decreases under α-methyl-p-tyrosine administration, it does not reach the threshold level and does not cause motor disorders. Thus, we have proposed a new methodology for the development of preclinical diagnosis of PD.

Biography

Michael Ugrumov, MD, PhD, Head of Laboratory of Neural and Neuroendocrine Regulations at the Institute of Developmental Biology of Russian Academy of Sciences (RAS), Professor of Department of Psychology at the National Research University "Higher School of Economics" (Moscow), Vice-President of the Russian Society for Physiology, President of the Russian Society for Neurochemistry. Ugrumov is a member of the Russian Academy of Sciences, European Academy of Science and Arts, Serbian Academy of Sciences and Arts, French National Academy of Pharmacy and was nominated as a visiting Professor at Tokushima University Medical School (Japan), SUNY Upstate Medical University (Syracuse, USA), University P. Et M. Curie (Paris, France), University Medical School of Ulm (Germany). Ugrumov was awarded the prize of the American society of Experimental Biologists, the Order of merit for France, the Orbeli Prize and Sechenov Prize of the Russian Academy of Sciences.

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Sinerik Ayrapetyan

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The dysfunction of quantum-sensitive cgmp-dependent ca-efflux from the cells as a target for age-dependent nerve disorder therapy

The Na/K-pump-driven water efflux from the cells is a fundamental metabolic mechanism controlling cell membrane semipermeable properties, the dysfunction of which is a common consequence of cell pathology, including aging. In cell membrane two quantum-sensitive families of non-canonical ouabain receptors, that regulate Na/K pump activity by [Ca]i, have been discovered: the first (α3) activates cgmp-dependent-Ca efflux from the cells, while the second (α2), which is less sensitive, activates camp-dependent-Na/Ca exchange in reverse mode. The dysfunction of α3 receptor function leading to the increase of intracellular Ca contents, which is a strong inhibitor for Na/K pump activity, is suggested as a primary mechanism for generation of age-dependent nerve disorders. To check this hypothesis, the age-dependence of rat's brain cortex, subcortex and cerebellum tissues hydration, dose-dependent 3H-ouabain binding, 45Ca2+ uptake and efflux, intracellular cgmp and camp contents were studied. It was shown that the among the mentioned families of ouabain receptors, the α3 receptors has age-dependent dysfunctioning character and its age-dependence decrease of ouabain receptors affinities is accompanied by cortex brain tissue dehydration, the increase of intracellular Ca contents, decrease of intracellular cgmp and camp contents. On the basis of the obtained data the cgmp-dependent Ca efflux from the cells is suggested as a quantum-sensitive therapeutic target for aging-induced nerve disorder therapy.

Biography

Sinerik Ayrapetyan has received his PhD in cell biophysics in the Institute of Physiology of the Ukraine Academy of Sciences, Kiev during the period of 1966-1970. Currently, he is the coordinator of UNESCO chair at Life Sciences International Postgraduate Educational Center, Yerevan, Armenia and coordinated the activities of UNESCO/UNITWIN network on research and postgraduate education in Biophysics, Biotechnology and Environmental Health Control. His research includes the study of metabolic regulation of cell function in norm and pathology. He is serving as a Chief Editor for the Journal of "Bioequivalence and Bioavailability", "Biomedical Engineering Current Research", "Basic, Applied Pharmacy and Pharmacology" and "Pharmacology & Pharmaceutical Research". He is also an editorial member of several reputed journals like "Electromagnetic Biology and Medicine", "BBA General Subjects", "Clinical Investigations", "Genetic Engineering and Biotechnology" etc. Prof. Sinerik Ayrapetyan is a member of a number of international societies, such as International Society of Invertebrate Neurobiology (ISIN), International Society for neurochemistry (ISN), European Society for Neurochemistry (ESN), International Brain Research Organization (IBRO), International Union of Pure and Applied Biophysics (IUPAB), Bioelectromagnetics Society (BEMS), WHO International Advisory Committee on Electromagnetobiology. He has authored 7 international books and 115 research articles.

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