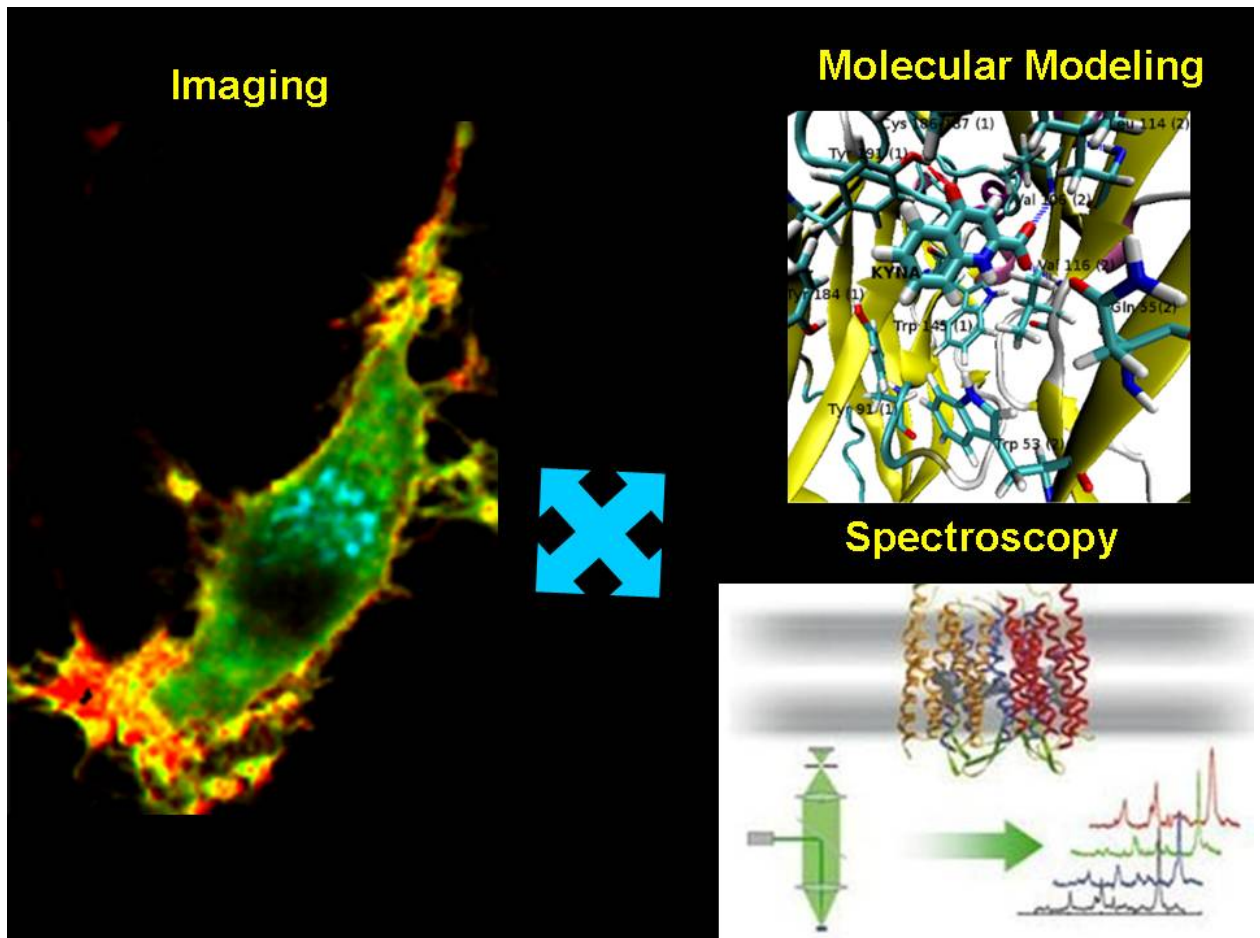


## Welcome Letter



Dear Colleagues,

We have pleasure to meet you at the first international conference on "**Quantitative imaging and spectroscopy in neuroscience**" (**QISIN**) which will take place in Pavlov Institute of Physiology, Koltushi, St. Petersburg, 2012, Russia from September 16<sup>th</sup> to 19<sup>th</sup>.

Since the motto of the Conference is the foreseeing of Ivan Pavlov that "**The Physiology of a Cell**, which is going to replace our modern **Physiology of an Organ**, must be viewed as the herald of the last step in Life Sciences, namely, the Physiology of a Living Molecule", our primary goal is not to discuss your fantastic papers, but rather to join your efforts, your techniques and your experience to put forward a new problem - **the Physiology of a Living Molecule**.

In other words, we welcome your ideas and concepts which cannot be articulated to get financial support at traditional conferences.

How does a **Living Molecule** function?

Indeed, during the past century we have been descending from **The Physiology of an Organ to The Physiology of a Cell** and now it is high time to start thinking **about the Physiology of a Living Molecule**.

In a way, it is a replacement of our concepts of Life inspired by Evolutionary theories of Darwin and Pavlovian Conditioning.

However, the pure Neuroscience belonging only to Neurophysiologists, is coming to an end. Recent findings both in neurobiology where **Imaging is the** most powerful

insight into **The Physiology of a Cell** and genetics promote an outbreak in our traditional notion of neural transmission. Nowadays in our understanding of synaptic plasticity, long term potentiation (LTP) and long term depression (LTD) presumed to comprise a fine cellular basis for learning and memory we have to address the whole spectrum of purely genetic topics of neuron-specific transcription, epigenetic chromatin remodeling, trafficking of mRNAs from soma to the remote sites of their local translation in axons and dendrites. Our pursuit of unraveling the etiology of neural diseases posed a problem of three-dimensional spatial and dynamic organization in nucleus of a nerve cell. This dynamic nuclear medium emphasizes the significance of the role of self-organization in the formation of its structure, when the chromatin domains located far apart in the linear DNA, as well as chromosome arms, can have physical contacts or terminate them. This provides such a level of plasticity of complex biological systems that allows them to respond to environmental stimuli or signals during the development.

Therefore, it is not surprising that recent works on invertebrates (different Molluscan species) coming from Pavel Balaban's group and concerning evolution of the nervous system and behavior address "the law of homologous rows of hereditary variability" formulated by plant geneticists Nikolay Vavilov.

We are not very accustomed to think about **the Living Molecule (protein, DNA or RNA)** in terms of their evolutionary capacity of being self-sufficient, i.e. the capacity of nucleotides and amino acid residues based on rigid "behavioral" rules of their atoms to provide their own oscillatory (wobbling) spectrum. If so, **Spectroscopy** goes hand in hand with **Molecular Modeling** and our best **Theoretical and Experimental Models** should combine the techniques of **Cellular Imaging** and **Spectroscopy** in a single approach aimed to answer the main question: what for we are doing this?

Presumably, we are doing this for the development of a new-age therapy of psychiatric disorders.

Therefore, we are looking forward to a break-through, to thought-promoting presentations with lots of home-take messages

#### Heads of Organizing Committee

Elena Savvateeva-Popova

Head of the laboratory of Neurogenetics

Pavlov Institute of Physiology

Sergey Lushnikov

Head of the laboratory of ferroelectricity

and magnetism

Ioffe Physical Technical Institute