**Institute of Fundamental Medicine and Biology**

**Department of Human and Animal Physiology**

**Master degree program**

**Neurobiology**

The program aim is to training highly qualified specialists in the field of neuroscience, owning modern knowledge and methods of experimental neurophysiology and physiology, functional diagnostics, skills to work with a variety of laboratory animals, mathematical and statistical analysis of data. During education students acquire knowledge about the structure and functions of the regulatory systems of the body, mechanisms of the functioning of nervous system from cellular to system level, the basic laws of human higher mental functions related to his cognitive activity and the role of genetic and environmental factors in their formation during ontogenesis and phylogenetic evolution of living organisms. During training, students study methods of recording and analysis of bioelectrical activity of nervous system on cellular and system level, methods for recording and analysis of electrical potentials, methods for evaluating the functional state of the body at rest and in different types of activities, methods of analysis and processing of experimental data.

**The strategic objectives of Master`s program are**:

1. Training highly qualified professionals owing modern methods of neurophysiology, able to study the activity of the nervous system on molecular and system levels.
2. Achieving world-class quality of scientific research and technological developments in the field of neurobiology

3) Students’ active participating in research projects. By the end of the Master’s program graduates are able to design and perform PhD research projects.

**General courses**

* Philosophy in Life Sciences
* Psychology of leadership: training workshop
* Professional languages: Russian and English (or other foreign language)
* Basics of Economics and Management sciences
* Ethics in biomedical research and practice of medicine
* History and methodology of biomedicine
* Computer technologies in biology, medicine and pharmaceuticals. Programming and mathematical modelling

**Special courses**

* Molecular and cellular neurobiology (ion channels, synapses, the basics of excitability, neurochemistry);
* System neurophysiology
* Cognitive neuroscience (mechanisms attention, perception, decision making, memory, motivation, language, emotion)
* The ontogeny of the nervous system (the study of brain development and the role of early activity in the formation of neural networks in the pre- and postnatal human and rat
* Computational neuroscience and modeling

**Requirements**

Those graduates already holding a Bachelor's degree can apply for admission to Master's degree programs. Bachelor or specialty degree in Life Sciences, Medicine is preferred

1. Applicants must have a qualification/degree corresponding to a 4-year educational program of higher education.
2. If English is not the student's native language, then his/her TOEFL examination results (or equivalent) will be no less than 80 for an on-line test, or no less than 5,5 for IELTS. Training within the Program will be given in English and Russian.
3. Interview

**Additional information**

Experimental basis for the implementation of research projects of the program are Laboratory of Neurobiology and Motor Rehabilitation, which were organized at the Department of Human and Animal Physiology. Laboratory of Neurobiology has the status of an International laboratory associated with the Mediterranean Institute of Neurobiology, Marseilles, France. The laboratory is equipped by the highest international standards and allows students to carry out research at the level of ion channels, neuronal networks and cognitive functions. Electrophysiological studies can be fulfilled both in cell cultures, brain slices (in vitro), and the whole brain of an animal (in vivo). For extracellular recording the activity of the cerebral cortex unique multi-channel silicon electrodes are used, allowed for simultaneous recording and analyzing the work of ensembles of neurons, optical recording methods. In the laboratory leading scientists, recognized worldwide are working. One of the main research directions of the laboratory is devoted to the study of brain development in ontogeny. Other areas of researches are included the neurobiology of pain, mechanisms of synaptic plasticity. Students are given the opportunity of internships in foreign laboratories.

**Credit hours**: 120 ECTS

**Deadlines for admission**: till June, 1

**The cost:** 261 000 rub. (price of 2016)

**Duration of the program**: 2 years