

CONFERENCE for YOUNG SCIENTISTS-2015 (CYS-2015)

WORKSHOPS

1 Modeling biological processes with focus on metabolism models

(1 or 2 groups up to 12 people)

Institute of Molecular Biology and Genetics National Academy of Sciences of Ukraine

Tutor: Ruslan Rodriguez

Course description:

What you will learn?

- Tasks that can be solved with models;
- Types of models;
- What type of model suits best for your study, how to choose model.
- Pros and cons of different modeling techniques.
- Most popular modeling software.

Hands-on:

- Databases of models
- Metabolic network reconstruction
- Constraints-based modeling
- Kinetic modeling
- Stochastic modeling

2 Introduction into flow cytometry

(1 or 2 groups up to 10 people)

Palladin Institute of biochemistry National Academy of Sciences of Ukraine

Tutor: Kyrylo A. Pyrshev

Course description:

Flow cytometry is a generic name for techniques which involve the analysis and/or separation of particles in a flowing stream by quantification of optical parameters.

The aim of the course is to introduce students to practical features of flow cytometry.

The course will take you through:

- 1) Short introduction in flow cytometry;
- 2) Basic knowledge: how to design and choose the right experiment; sample preparation;
- 3) How to operate the instrument: overview of Beckman Coulter XL flow cytometer and software for analysis;
- 4) Hands-on experiments: creating the optimal protocols for scattering and fluorescent approaches for studying the cell death.

3**Confocal microscopy**

(3 groups up to 24 people)

Bohomolets Institute of Physiology National Academy of Sciences of Ukraine

Tutor: Oksana Rybachuk

Course description:

Immunohistochemical staining of organotypic culture of hippocampi and stem cells of different origin (neural stem cells and bone marrow stem cells).

4**Langendorff Isolated Rat Heart**

(3 groups up to 24 people)

Bohomolets Institute of Physiology National Academy of Sciences of Ukraine

Tutor: Yulia Goshovska

Course description:

Langendorff technique allow to measure contractile activity of isolated rat heart by latex balloon placed in left ventricle and connected to registrarator. The participants will be able to measure the main indexes of heart function (left ventricular developed pressure, dP/dt , heart rate and coronary flow). You will learn the main principle of heart work, oxygen utilization by myocardium and regulation of heart functions those not depended from nerve control. You will be able to perform the process of heart connection to the Langendorff apparatus and pulmonary artery catheterization, measurements of oxygen tension in solutions in- and out flowing from the heart by your own.

5**Basic patch-clamp technic: theory and some practice**

(1 group up to 4 people)

Bohomolets Institute of Physiology National Academy of Sciences of Ukraine

Tutor: Oleksandr Dovgan

Requirements: physics (basic knowlages), good motor skills of hands.

Course description:

During 4-hours training some basic items of electrophysiology will be introduced. Composition of internal and external solutions, "cooking" desired glass pipettes , basic interpretation of obtained electrophysiological registrations and other technical moments will be discussed. During practical part, we will try to obtain whole-cell patch recordings from cultured hippocampal neurons.

6 Transmission (antireflection) electron microscopy: basic objectives and approaches for use

(1 or 2 groups up to 5 people)

Zabolotny Institute of Microbiology and Virology National Academy of Sciences of Ukraine

Tutor: Serge Voychuk

Course description:

1. Introduction to the method and microscope JEM-1400 (Jeol, Japan)
 - a. Problems solved by TEM
 - b. Introduction to the structure and characteristics of the example TEM JEM-1400
2. Methodical bases of preparation of samples for analysis by electron microscopy:
 - a. Preparation of films pidlozhok formvaru and carbon films
 - b. Preparation of samples and drawing on mesh
 - c. Positive and negative staining
 - d. Image analysis by TEM

7 Basics of Chromatography

(2 groups up to 10 people)

Zabolotny Institute of Microbiology and Virology National Academy of Sciences of Ukraine

Tutor: Andriy Ostapchuk

Course description:

The theoretical basis of the method of chromatography, classification and designation. Construction of gas and liquid chromatograph, methods of detection. Chromatography-mass spectrometry - especially variations of the method of mass spectrometric detectors and their purpose. Methods of ionization. Analysis of fatty acid methyl esters by gas chromatography-mass spectrometry for identifying microorganisms. Determination of caffeine by liquid chromatography.