

Course Plan

Elective Course: “Toxicology in Medicine”

Course organizers:

Professor, Doctor of Biological Sciences, BD Zhivotovsky

Doctor of Biological Sciences, VG Gogvadze

The main goal and objective of the elective course "Medical Toxicology" is the training of medical and pharmaceutical students in the field of toxicology. The course involves as participants the students of the Faculty of Basic Medicine, doctors and pharmacists, as well as students and researchers from MV Lomonosov Moscow State University and other Moscow institutes.

Toxicology - the field of science that studies the poisonous (toxic) substances, the potential risk of exposure, mechanisms of their harmful actions, methods of diagnosis, prevention and treatment of diseases developing due to such exposure. Toxicology has priority in the development of principles and criteria for evaluating the biological effect of chemical environmental pollution, prediction of the toxicity of chemical compounds, the analysis of the toxicity of newly developed pharmaceuticals, as well as clarification of the patterns of distribution of toxic substances in the body, their accumulation in organs and tissues, biotransformation and excretion. Relevant knowledge will be presented in the form of lectures and seminars. Students will participate in the writing of essays and discussion on the proposed topics.

The course will be conducted in English.

The course includes 12 lectures (24 hours) and 12 hours of seminars.

The course will include the following lectures:

February 21, 18.00 – Boris Zhivotovsky (BZ)

1. Principles of Toxicology. The history of the subject, the general mechanisms of toxicity, risk assessment, toxicokinetics, role in medicine.
2. Toxic agents and the effect of their actions in various organs.

February 28, 18.00 – Vladimir Gogvadze (VG)

3. The molecular and cellular basis of toxicology. Molecular targets, active intermediates, responses to cellular stress, oxidative/reductive stresses.

March 7, 18.00 – Vladimir Gogvadze (VG)

4. Methods in Toxicology. The ratio of the dose-response, the principles of acute toxicity in various organs, the selection of animals, histology and autopsy, microscopy.

March 14, 18.00 – VG

5. The consequences of the toxic effects on mitochondria.

March 21, 18.00 - BZ

6. The role of the mechanisms of cell death in toxicology.

March 28, 18.00 - BZ

7. Carcinogenesis and genotoxic carcinogens.

April 4, 18.00 - VG

8. Xenobiotics and their biotransformation.
9. Hepatotoxicity.

April 11, 18.00 – BZ

10. Clinical Toxicology. Toxicokinetics (LD50), dialysis, diarrhea, treatment of the poisoned patients, toxic effects of drugs.

April 18, 18.00 - VG

11. The pharmaceutical and industrial toxicology.
12. Environmental toxicology.

April 25, 18.00

Seminar

May 16, 18.00 - BZ

Seminar - presentations

Offset/Credit

Preliminary topics of the essays:

1. Response of blood system on toxic insult
2. Response of the immune system on toxic insult.
3. Liver response to alcohol
4. Acute kidney injury
5. Adaptive kidney response to toxic insult
6. Neuropathy
7. Toxic effect of organic solvents
8. Toxic effect of metals
9. Toxic effect of pesticides
10. Domestic carcinogens and their effect

Topics of essays will be offered after the start of the course.

Reporting Form: Decision will be based on the result of an interview or student's essay.