



**Proposals for cooperation
of Industrial and Biomedical electronics department of NTU "KhPI"**



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We train specialists in the field:
Speciality number 153. «Micro- and nanoelectronics »
specialty “Biomedical electronics”



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The achievements of scientific groups



Developing new diagnostic methods using standard and nonstandard bioelectric signals

Research interests of group - use of information technologies for the processing of standard bioelectric signals (ECG , EEG , EMG) and additional diagnostic information. Also, the group is engaged in the development of new methods of determining the state of biological objects on the basis of measurement of electrostatic weak signals due to external factor disturbances.

Current projects: Researching the unsteady electrical signals arising in the chemical and biological liquid samples under external load factor.

Head of group: Shchapov Pavel Fedorovich, Doctor of Engineering Sciences, Professor.

Group members: Tomashevskiy R.S., Ph.D., Ass. Professor;
Korol Y.I., Ph.D., Ass. Professor;
Vikarii Y.H., Ph.D. student.

Developing and researching methods and devices of telemedicine

The Group engaged in development and research of methods and devices for remote monitoring physiological parameters. In particular, the creation of a portable telemedicine device to exchange biomedical data over wireless communication channels.

Current projects:

- Researching methods of constructing the biometric devices and complexes;
- Researching methods processing and compression of difficult biometric signals (EEG, ECG);
- Researching methods transmitting biomedical information;
- Researching the possibility of practical use module ARDUINO in telemedicine problems.

Head of group: Sokol Yevgen Ivanovych, Doctor of Engineering Sciences, Professor.

Group members: Shyshkin M.A., Ph.D., Ass. Professor;
Kolisnyk K.V., Ph.D.

Developing of technical means for research of respiratory function

Group is engaged in the design and research technical means for determining the parameters of the function of external breathing human. Design and implementation of sensor volume of air speed, improved accuracy and sensitivity of the flow, the development and research of spirometers.

Current projects: - Research of the dynamic properties of the measuring turbine Medical International Research;
- Reducing energy consumption and improving noise immunity portable turbine spirometer through the use of special modes of the optical power of the measuring channel.

Head of group: Kulichenko Viacheslav Victorivich, Ph.D., Ass. Professor.

Group members: Tomashevskiy R.S., Ph.D., Ass. Professor;
Korol Y.I., Ph.D., Ass. Professor;
Makhonin M.V., Ph.D. student.

The definition the state of the plasma membrane of red blood cells by optical methods

Determination of functional parameters of erythrocytes by mathematical processing of the holographic image, followed by statistical analysis. This method allows to diagnose the disease at the membrane level and choose the appropriate therapy that complies with international WHO standards of diagnosis and treatment.

Current projects: - Holographic system for determining the state of plasma erythrocyte membranes.

Head of group: Tomashevskiy R.S., Ph.D., Ass. Professor.

Group members: Barkhotkina T.M., Ph.D., Ass. Professor;
Dolinin D.O.

Modeling physiological processes in humans

Development of medical devices based on physiologically adequate models of physiological processes. It is assumed by means of simulation of the available measurement of integrated clinical data are not available to receive the measurement of functional characteristics of diagnosed system.

Current projects: - Development of the device early diagnosis of type 2 diabetes mellitus (T2DM);
- Development of differential diagnosis of impaired glucose tolerance to the device (IGT).

Head of group: Lapta Stanislav Sergeevich , Ph.D., Ass. Professor.

Group members: Sokol Y. I., Doctor of Engineering Sciences, Professor;
Kolisnyk K.V. , Ph.D., Ass. Professor;
Chmykhova O.V., Ph.D. student.

Techniques and tools for the correct dosage of ozone during systemic ozone therapy procedures

Analysis of the interaction of ozone-oxygen mixture with liquids, including human blood. Development of methods and equipment for the preparation of drugs and ozone therapy procedures. Development of methods and instruments for analysis of the impact of ozone on the human body.

Current projects:

- Development and improvement of the ozone generator;
- Developing way of evaluating of the cell membrane status;
- Development of a method and equipment for the correct dosage of ozone during intravenous infusion of ozonated saline treatments;
- Development of the method and equipment for extracorporeal oxygenation and ozonation of large volumes of blood.

Head of group: Kypens'kyi Andriy Volodymyrovych, Doctor of Engineering Sciences, Professor.

Group members: Barkhotkina T.M., Ph.D., Ass. Professor;
Korol Y.I., Ph.D., Ass. Professor;
Makhonin M.V., Ph.D. student;
Glukhenkaya T.A. external doctoral candidate.