Belarusian State University
of Informatics and Radioelectronics

R&D Department

Announcement of BSUIR participation in the International Medical Forum "BELARUSMEDICA 2025"

April 15 – 18, 2025

The Republic of Belarus, Minsk,
Football Arena (Pobediteley Ave., 20/2)
BSUIR booth B9

The Forum "BELARUSMEDICA" is held annually in Minsk since 1994 and draws the attention of a large number of international and Belarusian leaders of the medical and pharmaceutical industries, leading healthcare institutions, developers of medical technologies, and suppliers of IT solutions for the healthcare system.

The Forum includes an international specialized exhibition and an extensive programme of business events.

The main areas of the exhibition: medical devices and equipment; pharmaceuticals; innovative technologies in medicine; dentistry: equipment, instruments, materials, drugs, technologies; medical devices, etc.

At the exhibition BSUIR will present a number of ready-to-use solutions (devices, systems, software, materials) for the healthcare industry. The full list of developments is available in the catalogue via this link (in Russian).

Ultrasound cavitometers

At the University's own production base the spectral-acoustic cavitation indicator and portable cavitometer are manufactured, which are designed for measuring and controlling cavitation activity and surpass foreign analogues in terms of functionality.

In medicine, these devices are used to study the ultrasound effect on physical and chemical processes in liquids and biological structures. For example, to increase the permeability of cell membranes (sonoporation) without significantly affecting the vital activity of a cell; to suppress cell growth and reproduction; to destroy cells without the possibility of restoration of functions, etc.

Advantages:
– high measurement accuracy;
– visualisation of measurement results in the form of graphs and diagrams.

Ultrasound High Frequency Disperser

In medicine it is used for obtaining suspensions or emulsions from various substances; cleaning surgical instruments from contaminants; processing samples from fibrous, crystalline, powdery and other substances in electron-microscopic studies; accelerating physical and chemical processes, including extraction, dispersion, destruction of cells and bacteria.

Advantages:
– shorter extraction, dispersion and other physical and chemical processes;
– cleaning and degreasing without the use of organic solvents;
– removal of contaminants in hard-to-reach areas of products.

About the developer

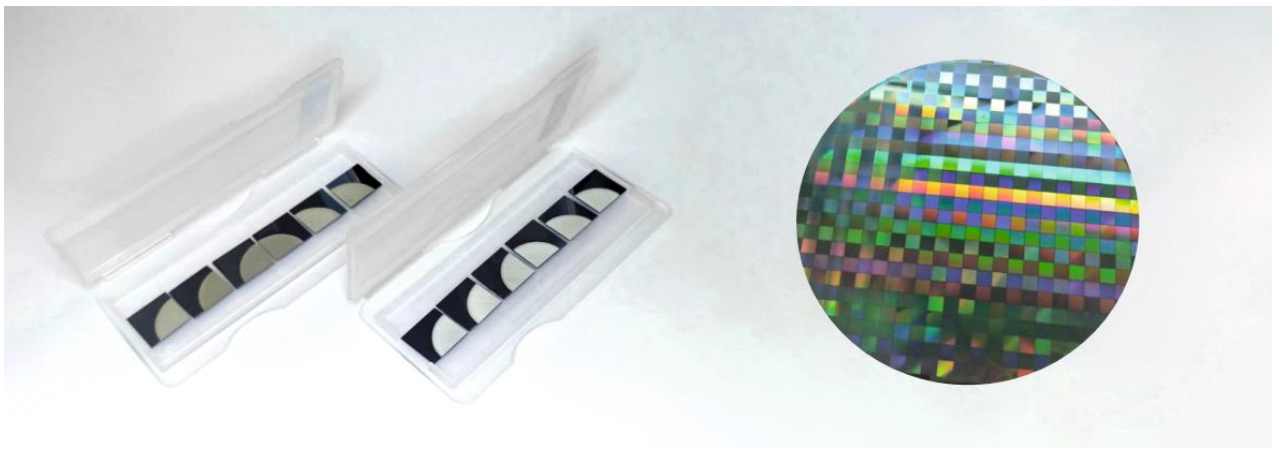
A system of patient-specific therapy for respiratory failure

The system can be used to automate the adjustment and correction of the rate, volume and time of exposure to oxygen supplied to the patient based on monitoring of his changing state and, in addition, it can be used for early diagnosis of respiratory diseases.

Advantages:
– increased efficiency of oxygen therapy due to patient-specific adaptation to the patient's changing state;
– automation of therapy mode selection and its correction;
– increased efficiency of patient weaning from the respirator;
– accelerated and efficient patient rehabilitation;
– possibility of remote patient management;
– safety of oxygen therapy;
– optimisation of oxygen consumption.

About the developer

Photonic sensors operating on the SERS-effect of surface-enhanced Raman scattering of light



BSUIR had developed a line of photonic sensors that, depending on the morphology of the sensitive area, allow for the detection and study of the structure of molecules, including disease biomarkers, and the high-precision analysis of biological fluids and sanitary-epidemiological swabs using Raman spectroscopy.

Advantages:
– unique technology of the formation of sensitive micro- and nanostructured areas;
– extended sensor shelf life compared to analogues;
– possibility to manufacture sensors that are maximally customised to the customer's requirements.

Powders of biodegradable nanoparticles for the visualization and analysis of biological objects

The powders are made from biodegradable nanostructured particles containing silicon and silver that exhibit photoluminescence, dissolve in biological fluids at a controlled rate depending on pH, and enhance the Raman signal, allowing for simultaneous cell imaging, molecular analysis, and drug delivery.

Advantage: an innovative technique for forming nanoparticles and using them to analyze cells and deliver drugs into them.

About the developer

We also **invite you to the seminar "Topical issues of pulmonology and phthisiatry" on April 16 at 10:00**, where Oleg Zelmanski, Associate Professor of the Department of Information Security of BSUIR, will present the following reports:
1. Hardware correction of disorders of natural drainage of tracheobronchial secretion.
2. Biotechnical system for diagnostics and patient-specific therapy for respiratory failure.

Seminar program (in Russian)