ADVANCED R&D AND TECHNOLOGIES

THE NAS OF UKRAINE

MEDICAL PRODUCTS AND MEDICAL DEVICE ENGINEERING

ADVANCED R&D AND TECHNOLOGIES

THE NAS OF UKRAINE

SPECIAL ISSUES

ENVIRONMENT AND NATURE PROTECTION

FOOD INDUSTRY

FUEL, LUBRICANTS,
AND TECHNOLOGIES

INDUSTRIAL AGRICULTURE
AND LANDSCAPE GARDENING

INFORMATION AND SENSOR SYSTEMS
AND DEVICES

INFORMATION TECHNOLOGY

MACHINE-BUILDING
AND INSTRUMENT ENGINEERING

MEDICAL PRODUCTS AND MEDICAL DEVICE ENGINEERING

POWER ENGINEERING
AND ENERGY EFFICIENCY

TECHNOLOGIES AND EQUIPMENT
FOR EXPLORING, ESTIMATING,
AND EXTRACTING MINERAL RESOURCES

TECHNOLOGIES FOR CONSTRUCTION
AND FUNCTIONAL MATERIALS

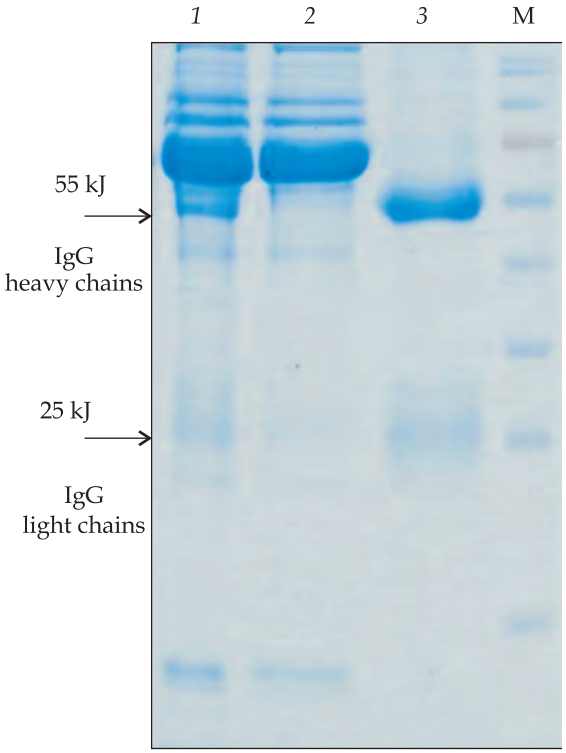
AFFINITY SORBENT FOR PURIFICATION OF ANTIBODIES

Areas of Application

The affinity medium based on oriented immobilized recombinant protein A Staphylococcus aureus can be used at research institutes and diagnostic labs for purification of monoclonal and polyclonal antibodies from ascites, serum, and cell culture supernatants; for fractionation of IgG into subclasses; and for isolation of antibody/antigen complexes in immunoprecipitation experiments

Specification

The affinity sorbent based on microcrystaline cellulose CC31 with immobilized recombinant protein A Staphylococcus aureus in the form of 50% suspension in 20% ethanol;
particle size: ~60—75 μm;
ligand density: ~1.5—2.0 mg ligand/ml sorbent



Electrophoregram of rabbit IgG purified by affinity sorbent: *1* — serum proteins loaded to the column; *2* — proteins unbound to the column; *3* — purified IgG eluted from the column; M is molecular weight marker

Advantages

The use of affinity medium enables a single-stage purification of antibodies. The cost of proposed affinity medium is lower as compared with that of the analogs

IPR Protection

IPR1, IPR2

Stage of Development. Suggestion for Commercialization

IRL3, TRL3
Affinity medium sample and protocol for antibody purification provided upon request. After tests, the offering can be proposed to manufacturers and suppliers of laboratory equipment, reagents, and materials

Contact Information

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ALCOTEST ANALYTICAL KIT FOR ENZYMATIC DETECTION OF ETHANOL IN BIOLOGICAL FLUIDS

Areas of Application

The kit can be used in medicine, forensic analysis, food and pharmaceutical industries for detecting and measuring the content of alcohol in biological fluids (whole blood, blood plasma, blood serum, saliva, and urine), monitoring fermentative processes in fermentation industry, and for analyzing ethanol in beer, wine, etc.

Specification

The kit has a high sensitivity (enables detecting 5—50 μg alcohol in 4 ml sample), reproducibility of results, and a wide range of concentration linearity from 0.2 to 4.5 g/l. The sample volume required for analysis is 1 ml. ALCOTEST has been registered as medicinal product by the State Pharmaceutical Center of the Ministry of Healthcare of Ukraine

Stage of Development. Suggestion for Commercialization

IRL7, TRL7
Manufacture of small batches, upon request

IPR Protection

IPR3

Advantages

The kit is cheap, easy-to-use, and stable when stored, enables rapid detection. There are no counterparts in Ukraine. The kit is much cheaper than the foreign commercial products

Contact Information

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ALTEC-4002 IN-TRANSIT MEDICAL REFRIGERATOR

Areas of Application

The device is designed for transportation of blood and plasma, serum and drugs, organs, bacteria and virus cultures between laboratories; transportation and preservation of vaccines; preheating of ampoules to 36 °C prior to vein injections. The device design meets the requirements for medical equipment including its disinfection. The power is fed from onboard network of the vehicle

Advantages

The device is efficient due to intensified heat exchange within the cooling chamber and fluid-to-air heat exchange with environment. At an ambient temperature of +20 °C, the temperature in 64-liter chamber reaches –30 °C

IPR Protection

IPR3

Specification

Cooling chamber dimensions, mm	400 × 355 × 455
External dimensions, mm	870 × 555 × 600
Ambient maximum temperature, °C	+50
Temperature inside the chamber at ambient temperature:	
+50 °C	–10
+20 °C	–30
Temperature control accuracy inside chamber, °C	±0.5
Temperature difference in the chamber, at most, °C	±0.5
Electric voltage, V	12, 24
Maximum electric power consumption, W	500
Refrigerator weight, kg	53

Stage of Development. Suggestion for Commercialization

IRL6, TRL6
Manufactured and supplied, upon request

Contact Information

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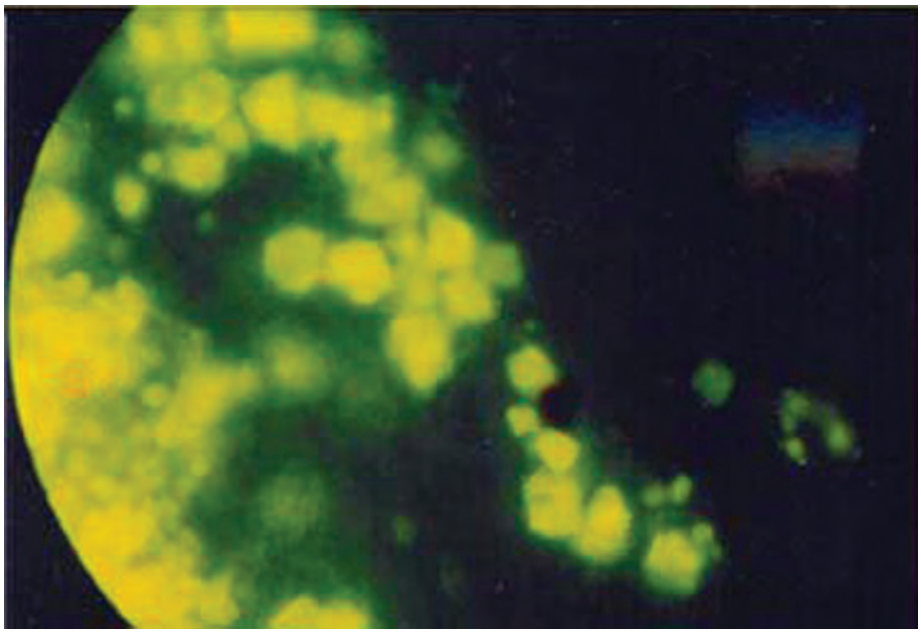
AMITOZINE ANTITUMOR DRUG



Accumulation of amitozine in tumor cells of human pancreas gland

Areas of Application

The drug is used for prevention and treatment of tumors at medical establishments

Specification

Amitozine is *Chelidonium majus* L. alkaloids modified with thiotepa

Stage of Development. Suggestion for Commercialization

IRL7, TRL7
Small batches manufactured, upon request.
Seeking partners for commercial manufacture

IPR Protection

IPR3

Advantages

Amitozine has no world analogs.
The drug has neither immunosuppressive nor inhibitory effect on hematopoiesis; shows immunomodulatory and cancinolytic action. The long-term administration of therapeutic doses does not lead to toxic effects. Tenfold administration of the drug at doses 1/10—1/16 LD50 does not cause pathological changes in the internal organs. The amitozine clinical studies on incurable cancer patients with 3rd and 4th stages of prostate, ovarian, esophageal, mesothelioma cancer, etc. in several hospitals in Ukraine have shown the presence of antitumor effect of the drug in about 75% cases

Contact Information

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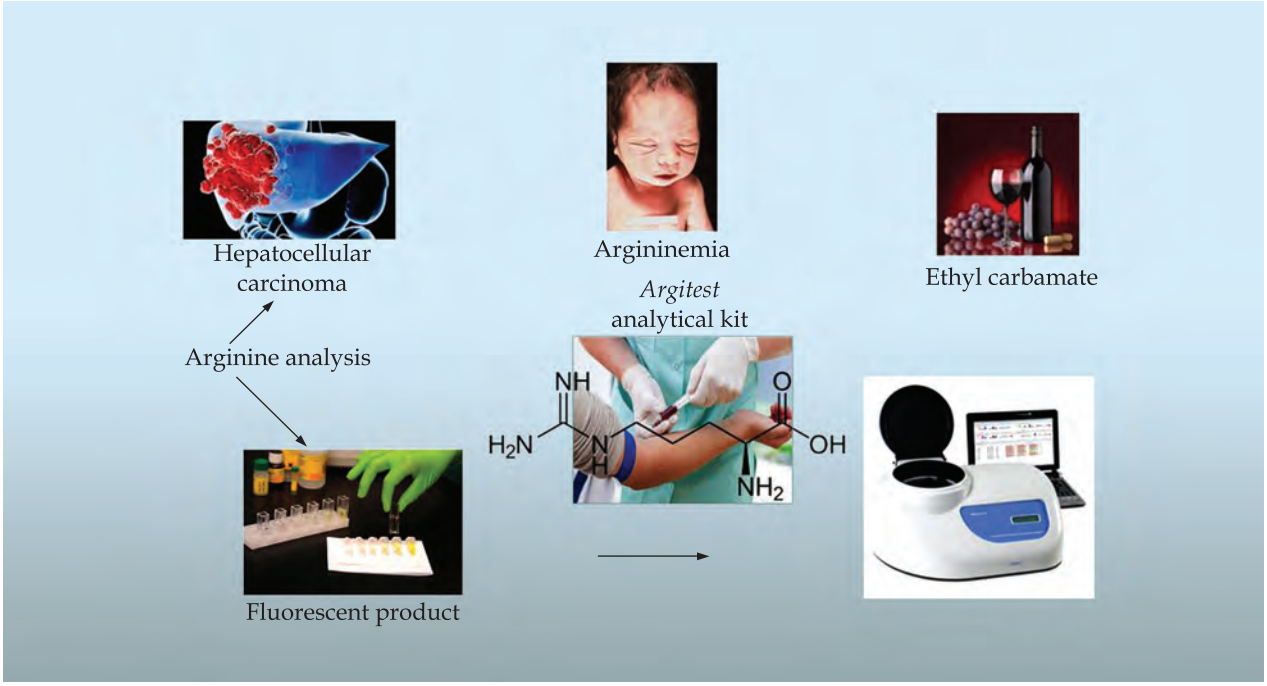
ARGITEST ANALYTICAL KIT



Possible application of *Argitest* kits

Areas of Application

The kit is designed to measure the arginine content in blood and foodstuffs. It can be used at clinical and pharmaceutical laboratories, analytical laboratories of food industry and scholarly research institutions

Specification

The kit is based on enzymatic and chemical assay with the use of recombinant arginase. The product is recorded by fluorometric technique. Both arginase and final reaction product have an excellent stability. The method is selective to arginine, economical, simple, and rather quick

Advantages

There are no counterparts in Ukraine. The *Argitest* kit enables to test simultaneously tens samples. The kit is much cheaper than the foreign commercial prototypes

IPR Protection

IPR3

Stage of Development. Suggestion for Commercialization

IRL6, TRL5
The *Argitest* kit may be introduced to the domestic market after registration of R&D documentation and undergoing of clinical and industrial lab tests

Contact Information

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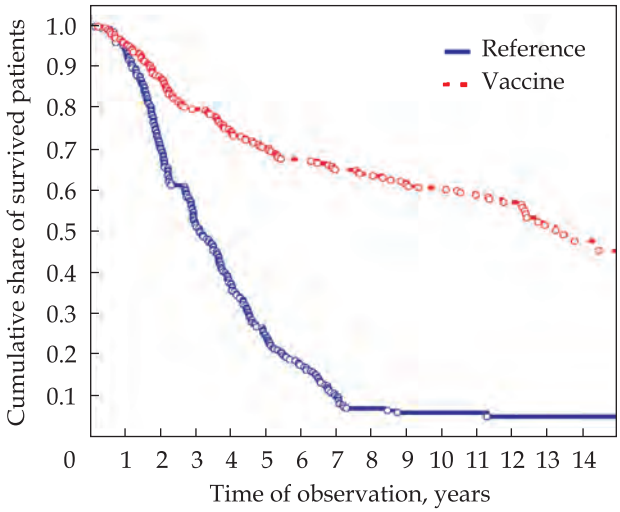
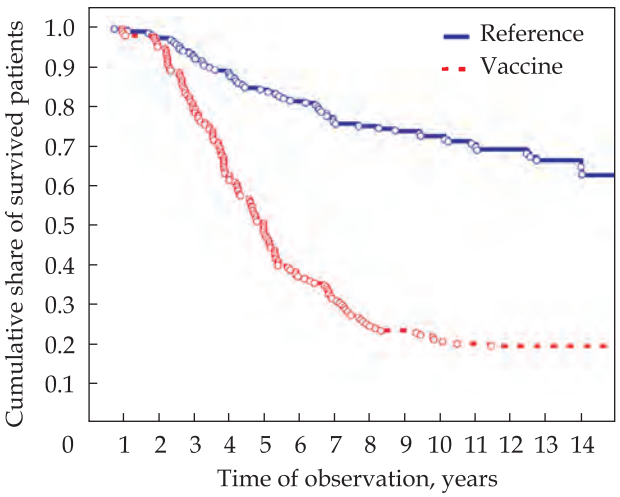
AUTOLOGOUS ANTITUMOR VACCINE

AAV appearance



Overall survival of colorectal cancer patients
(Kaplan-Meier test)



Overall survival of breast cancer patients
(Kaplan-Meier test)

Areas of Application

The vaccine is used for cancer biotherapy. The inclusion of antitumor autovaccine (AAV) into the therapeutic regimen of oncology patients enables preventing the development of metastasis and disease recurrence, increasing the survival rates, and improving their quality of life

Specification

The vaccine contains biotechnologically-modified (through the use of metabolism products of *Bacillus subtilis B-7025*) tumor antigens of autologous tumor

Advantages

There are no analogs of AAV. Suitable for the treatment of patients with various tumors. The vaccine has been tested in some oncological clinics in Ukraine and is prepared to be included into the standards for treatment of oncology patients. The AAV is well tolerated, nontoxic, and easy-to-use

Stage of Development. Suggestion for Commercialization

IRL7, TRL7
Seeking investors for getting license. Manufacture of AAV with patient material, upon request

IPR Protection

IPR1, IPR3

Contact Information

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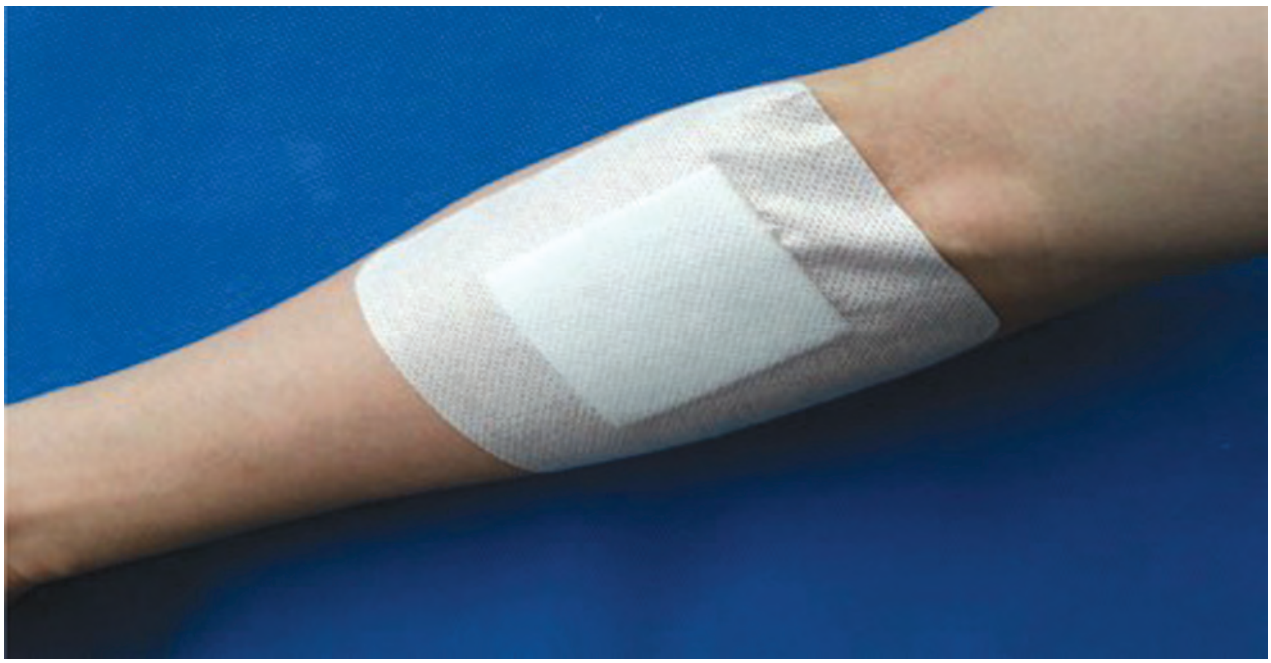
BIOCOMPATIBLE POLYMER MATERIALS FOR MEDICAL APPLICATION



Biocompatible polymer material for treatment of infected wounds and burns

Areas of Application

The materials are to be used at medical establishments for treatment wounds, burns, and trophic ulcers

Advantages

As compared with the foreign analogs, the materials have a prolonged antibacterial activity and enable to control the rate of release of biologically active compounds

Specification

Antibacterial activity towards anaerobic microorganisms: diameter of inhibited growth areas, mm	17—20
Antibacterial activity towards aerobic microorganisms: diameter of inhibited growth areas, mm	14—17
Water sorption, %	12—20
Rupture stress, MPa	5.5—6.2
Rupture elongation, %	102—110
Release of BAC after 1 day, %	28
Release of BAC after 14 days, %	40

Stage of Development. Suggestion for Commercialization

IRL4, TRL5
Seeking partners for further clinical trials and manufacture of materials

IPR Protection

IPR3

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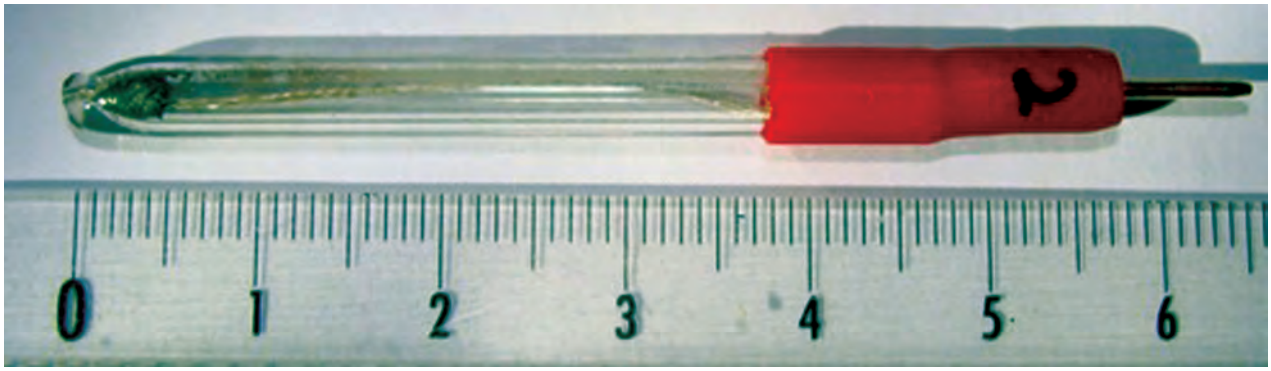
BIOSENSOR SYSTEM FOR MEASURING ATP AND GLUCOSE CONCENTRATION



Biosensor based on a platinum disc electrode

Areas of Application

The system is designed for measuring ATP and glucose concentrations in scholarly research studies and quality control of pharmaceuticals

Advantages

There are no commercial analogs.
The system enables simultaneous selective determination of both substances.
It is notable for a low laboriousness and a quick time of analysis (rapid analysis).
It is compact and portable. The number of detected substances is extendable by adding other biosensors to the biosensor system. The system does not require any sample pretreatment

Specification

Показник	Bioselective element based on	
	Glucose oxidase	Glucose oxidase and hexokinase
Analyzed substance	Glucose	ATP
Linear range, μM	10—2000	15—80
Operational stability, h	8	8
Storage stability, months	4	2
Duration of analysis, min	5	8—10
Measurement error, %	≤3	≤10

IPR Protection

IPR3

Stage of Development. Suggestion for Commercialization

IRL5, TRL4
Manufactured, upon request.
Seeking partners for mass production

Contact Information

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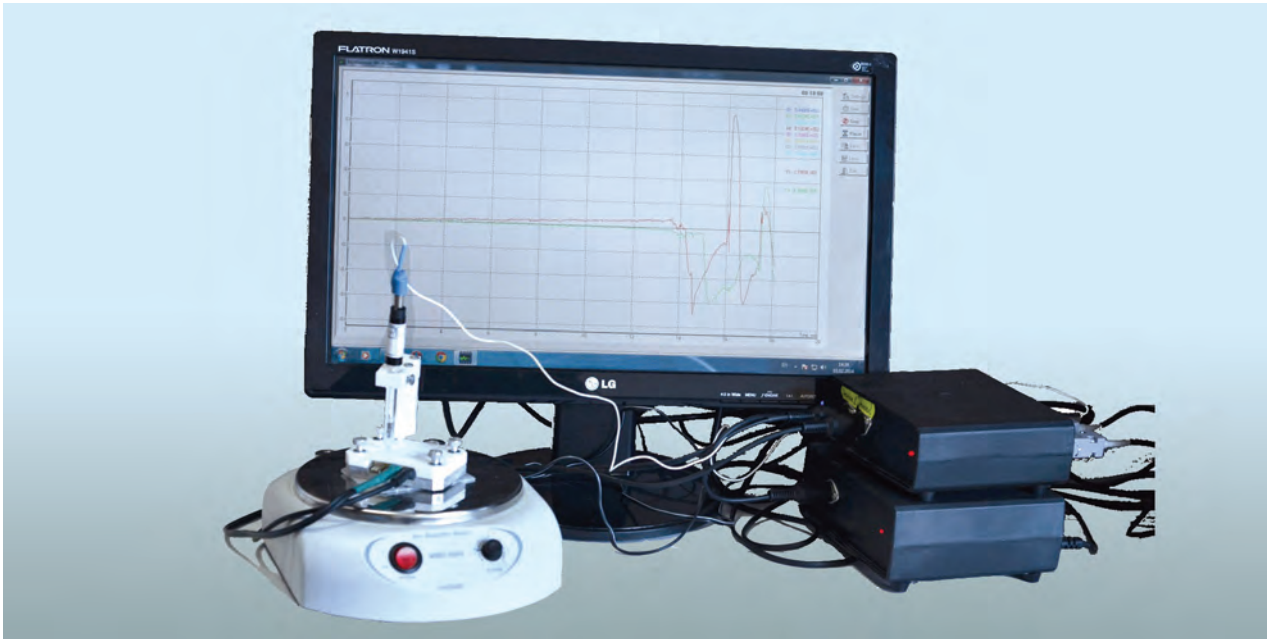
BIOSENSOR SYSTEM FOR UREA AND CREATININE DETECTION



Areas of Application

The system is designed to diagnose the kidney function and to control the quality of hemodialysis

Advantages

Commercial analogs are absent. Unlike the existing methods of creatinine and urea detection, the proposed system does not require any sample pretreatment, is notable for a low laboriousness and a low cost of analysis, has a high sensitivity and selectivity of detection, enables a quick analysis (rapid analysis) and simultaneous determination of both metabolites in real time, at the bedside

Specification

Показник	Bioselective element based on	
	creatinine deiminase	recombinant urease
Analyte	Creatinine	Urea
Linear detection range, mM	0.02—2.0	0.5—20
Operation stability, h	8	8
Storage stability, months	5	5
Time of analysis, min	5—7	5—7
Measurement error, %	≤5	≤5

IPR Protection

IPR3

Stage of Development. Suggestion for Commercialization

IRL6, TRL5
Manufactured, upon request.
Seeking partners for mass production

Contact Information

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CARBON ABSORBENT DRESSING BASED ON ACTIVATED CARBON FIBROUS MATERIALS

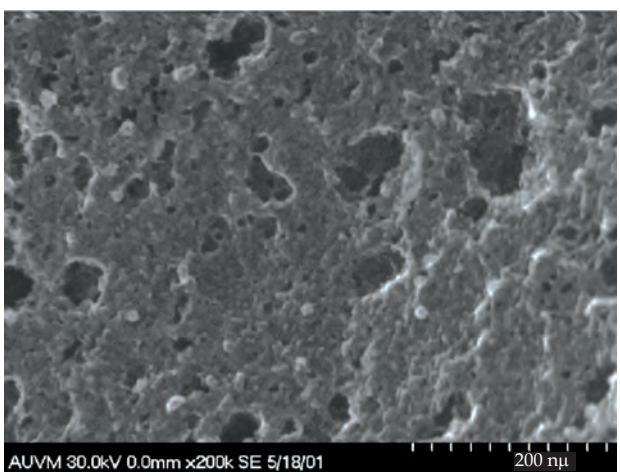
Carbon absorbent dressing

Areas of Application

The dressing is to be used in general and military surgery, combustiology to treat wounds and burns of various degrees of severity, including domestic accident burns, inflammatory complications, trophic ulcers, bedsores. It reliefs the traumatic edema, reduces the intensity of local and general inflammatory response, accelerates regenerative processes, and prevents the development of complications

Specification

The dressing has a high adsorption activity due to a large pore surface area of fibrous carbon materials (1800—2400 m^2/g), provides rapid adsorption of wound toxic products, bacterial toxins, and microbial cells. Available in any size in sterile double packaging. Certified for compliance with international standards in the manufacture and sale of medical devices



Porous surface of fibrous carbon materials

Advantages

There are no domestic counterparts. The absorbent capacity of the dressing is 1.5—3 times higher than that of the best foreign analogs, which enables to shorten the wound healing period 1.5—1.7 times

IPR Protection

IPR1, IPR3

Stage of Development. Suggestion for Commercialization

IRL8, TRL7
Manufactured, upon request.
Seeking partners for organization of manufacture

Contact Information

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CARBON-CARBON IMPLANTS

Areas of Application

The carbon-carbon implants are used in medicine for endo- and exo-prostheses

Specification

Density ranges 1.4—1.8 g /cm^3; mechanical and elastic characteristics are similar to those of the human bones; open porosity of 8—12%; high chemical and radiation inertness; high biocompatibility

Advantages

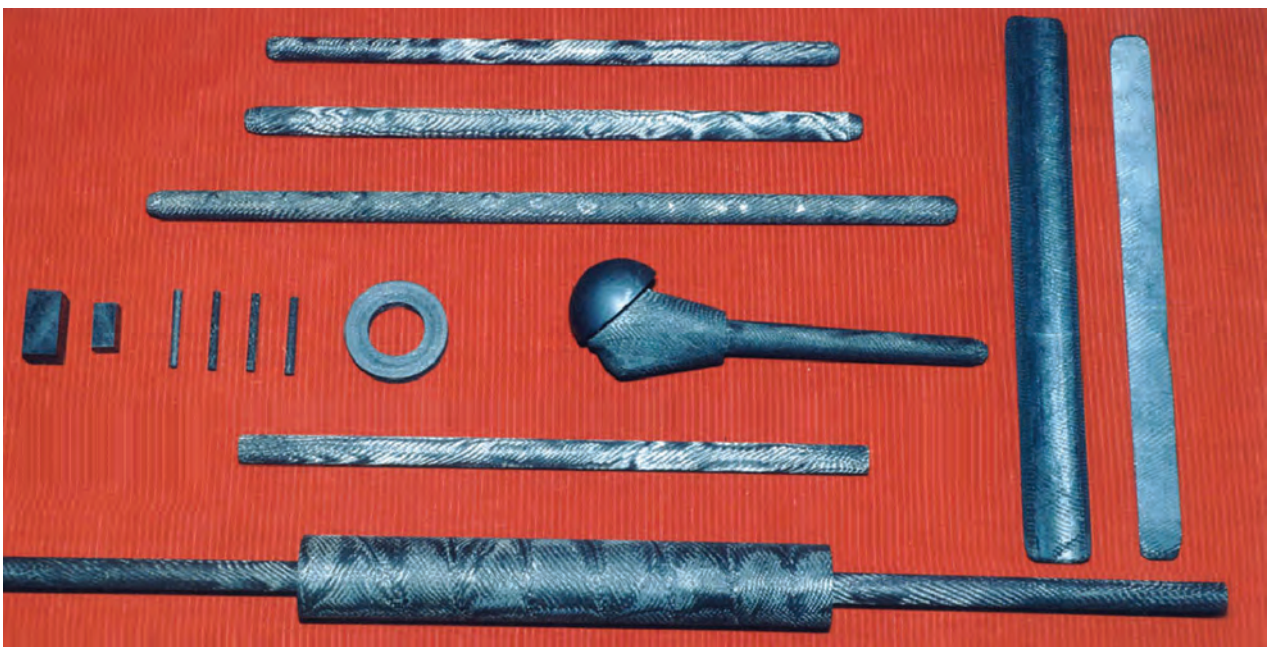
The carbon-carbon endoprosthesis encases and grows into bone tissue; no restrictions on chemotherapy and radiotherapy due to high chemical and radiation stability of the implants; no allergic reactions to carbon-carbon material; no problems when passing through the metal detectors. The implant materials are transparent for X-rays. All the necessary clinical trials have been passed. More than 150 surgeries in patients have been already done

Stage of Development. Suggestion for Commercialization

IRL8, TRL7
Manufacture, supply, and staff training, upon request

IPR Protection

IPR1, IPR2



Contact Information

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CARDIOMOOD INFORMATION SYSTEM FOR QUANTITATIVE EVALUATION OF PSYCHOEMOTIONAL TENSION OF HUMAN BODY

Receiving device of CardioMood information system for quantitative evaluation of psychoemotional tension of human body

Areas of Application

The system is used for support of healthy lifestyle in domiciliary conditions and for monitoring psychoemotional tension of the human body in labor medicine

Specification

The CardioMood system consists of heart rate sensors recording RR-interval based on ECG, and a receiving device (smartphone on Android version 4.3 and higher or laptop on Windows 8) that receives the signal from the sensor by Bluetooth Smart 4.0 channel

Advantages

The system uses low-cost intelligent sensors, mobile gadgets (smartphones), and cloud technologies; special mathematical models for diagnostic interpretation of output data are available

Stage of Development. Suggestion for Commercialization

IRL7, TRL8
Manufacture, delivery, warranty maintenance, and staff training, upon request

IPR Protection

IPR7, IPR2

Contact Information

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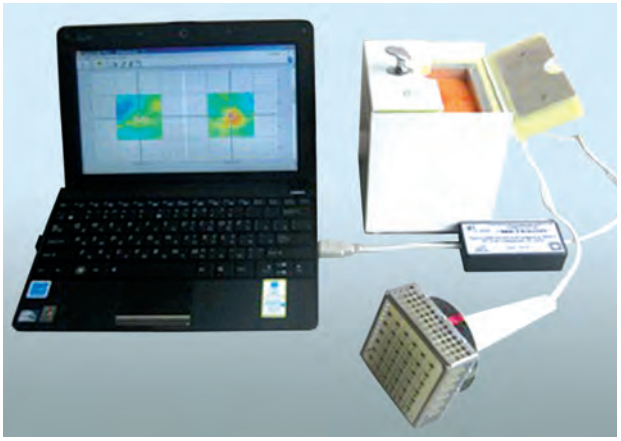
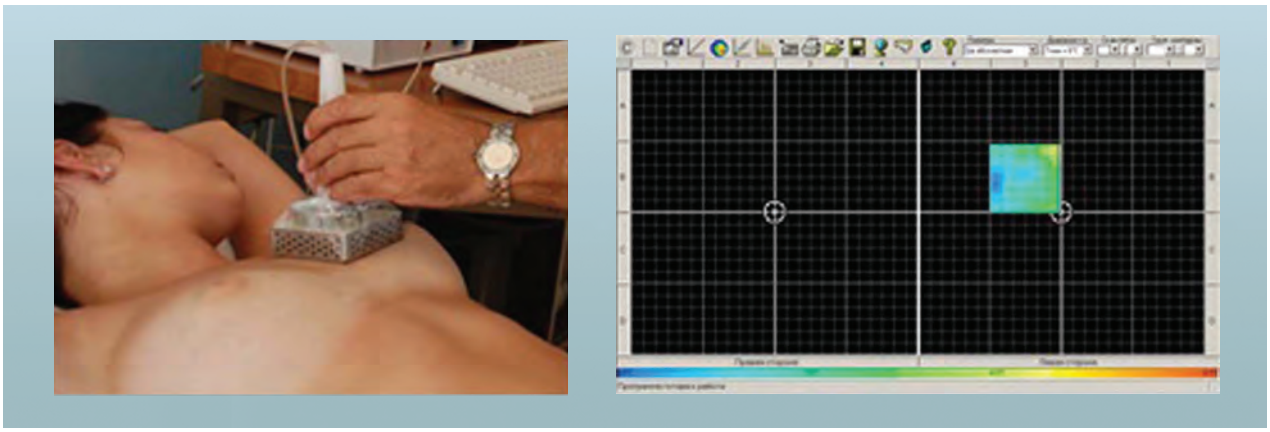
CONTACT DIGITAL THERMOGRAPHER



Specification

Hardware: notebook
Software: original, based on Windows 7
The device is recommended
for application by the Ministry
of Healthcare of Ukraine.

Temperature range, °C	20—38
Temperature resolution, °C	0.06
Spatial resolution, cm	1



Obtainment of mosaic thermograms

Areas of Application

The devise is used for special
and preventive surveys at clinics
and diagnostic centers to diagnose tumor
deceases at preclinical stages

Advantages

High accuracy (close to that
of X-ray analysis); harmlessness; lower price
as compared with analogs; portability

Stage of Development. Suggestion for Commercialization

IRL9, TRL9
Direct sales, licensing

IPR Protection

IPR3, IPR5

Contact Information

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DEVICE FOR RAPID COOLING OF BIOLOGICAL OBJECTS

Areas of Application

The device is designed for rapid freezing of tissues, cultures of somatic cells, and reproductive cells during cryopreservation and storage at the temperature of liquid nitrogen. The application fields are reproductive medicine, cattle breeding, and scholarly research

Specification

The device size is 787 × 400 × 520 mm. The main components are vacuum pump (2NVR-5DM); thermos with a capacity of 8.4 liters (useful capacity is 4 l); and single-channel recorder of temperature within the range from +50 °C to –270 °C connected to computer via USB port. The time of record of freezing ranges from 10 to 118 s. The system requirements are Windows ME/NT/2000/XP/Vista /7/8/10

IPR Protection

IPR3

Advantages

The device has no analogs.
It enables ultrafast freezing of objects in supercooled nitrogen (–210 °C); provides a high share of cells survived in the samples after thawing-freezing cycle; raises efficiency of living object storage protocols

Stage of Development. Suggestion for Commercialization

IRL3, TRL5
Manufacture, modification, supply, warranty service, and staff training, upon request

Contact Information

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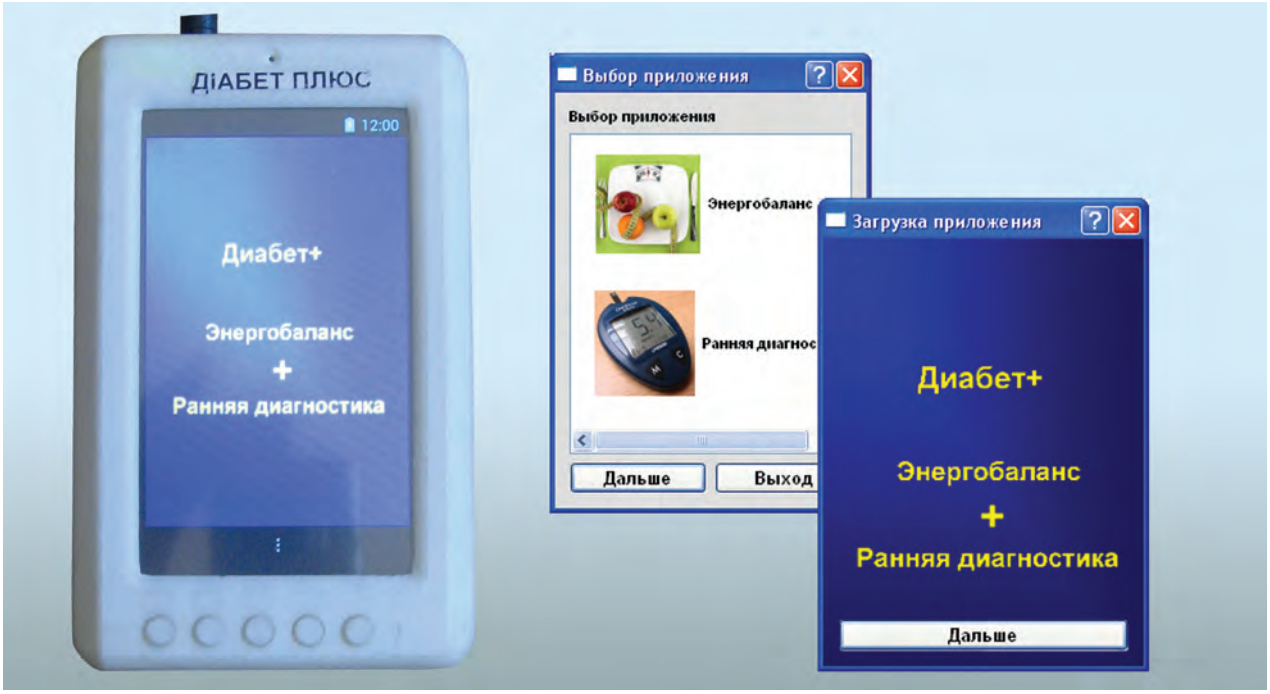
DIABETES PLUS DEVICE TO SUPPORT DECISION-MAKING FOR DIABETES TREATMENT



General view of device, start and menu windows

Areas of Application

The *Diabetes Plus* device is designed to support decision-making while diagnosing the preclinical forms of diabetes and choosing a balanced diet that is adequate to energy consumption for maintaining energy balance in the human body

Advantages

The algorithm increases the resolution of standard methods detecting the disorders; enables to quantify the degree of disorder and facilitates timely visit of patient to medical institution; actively involves the patient into the choice of diet corresponding to his/her activity and calculates energy balance; facilitates the prevention of diabetes or enables to keep it compensated

Specification

The Diabetes Plus device has the two functional modules: the diagnosis of early disorders of carbohydrate metabolism and the energy balance to support decision-making for choosing a balanced diet corresponding to the individual characteristics and needs of the user. The system and application software is adapted for Android operated mobile devices

Stage of Development. Suggestion for Commercialization

IRL3, TRL3
Seeking partners for serial manufacture

IPR Protection

IPR3

Contact Information

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DIAGLUC-2 ANALYTICAL KIT FOR FERMENTATIVE DETECTION OF GLUCOSE IN BIOLOGICAL FLUIDS

Specification

The kit has a high sensitivity (enables detecting 0.5—10 μg glucose in 4 ml sample), a high reproducibility of results, and a wide range of concentration linearity, up to 50 mmole/l. The sample volume required for analysis is 4 ml. DIAGLUC-2 has been registered as medicinal product by the State Pharmaceutical Center of the Ministry of Healthcare of Ukraine

Advantages

There are no counterparts in Ukraine. The kit is cheaper, more stable when stored, has a wider linearity range and a higher accuracy of analysis as compared with the foreign analogs

Areas of Application

The kit can be used for scholarly research works and clinical studies for measuring the content of glucose in biological fluids

Stage of Development. Suggestion for Commercialization

IRL7, TRL6
Manufacture of small batches, upon request

IPR Protection

IPR3

Contact Information

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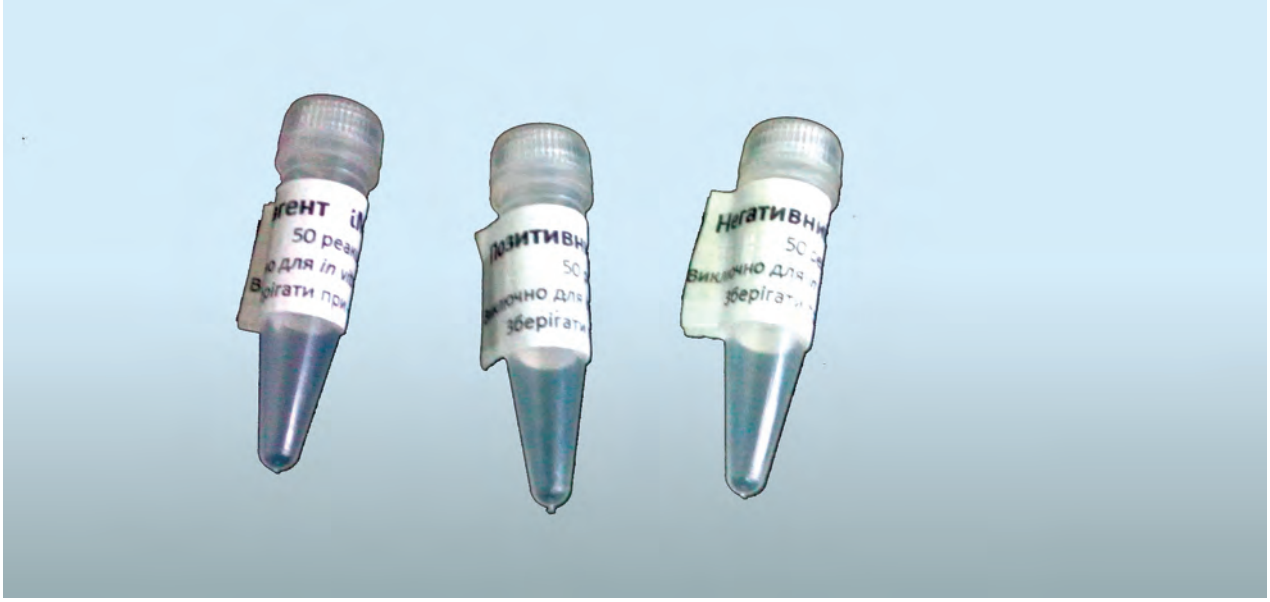
DIAGNOSTIC TEST FOR QUICK IDENTIFICATION OF PNEUMOCYSTIS IN CLINICAL SAMPLES



Areas of Application

The test is designed for quick specific diagnostics of pneumocystosis pneumonia, at different stages, in patients with high PCP risks (HIV patients and those who administer immunosuppressive therapy).
The test can be used at all hospitals equipped with a standard PCR diagnostic laboratory

Advantages

There are no analogs in Ukraine.
The test enables quick, high-sensitive, and specific diagnostics of pneumocystosis

Specification

The test sample comprises a master-mix, positive and negative controls, and guidelines for carrying out PCR and interpreting the results

Stage of Development. Suggestion for Commercialization

IRL5, TRL5
Trial samples production clinical tests, upon request

IPR Protection

IPR1, IPR2

Contact Information

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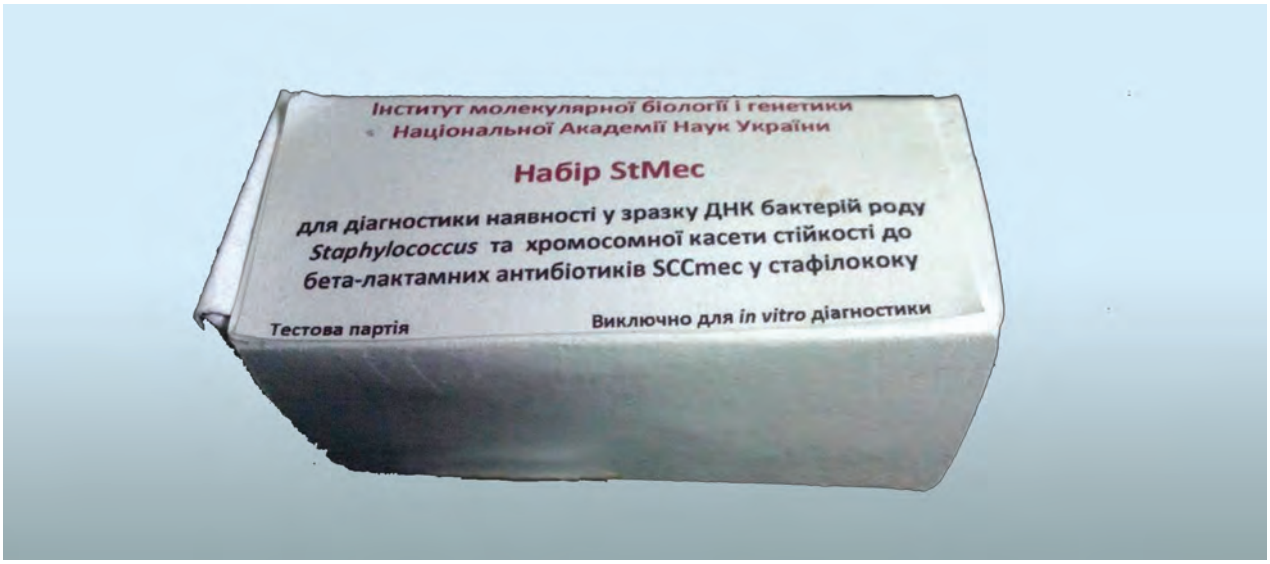
DIAGNOSTIC TEST FOR QUICK IDENTIFICATION OF STAPHYLOCOCCI AND ITS RESISTANCE TO METHICILLIN IN CLINICAL SAMPLES



Areas of Application

The test is designed to quickly detect staphylococcus infection and the absence or presence of methicillin resistance marker that determines beta-lactam susceptibility. The test can be used at all hospitals equipped with a standard PCR diagnostic laboratory

Specification

The tested sample comprises a master-mix, positive and negative controls, and guidelines for carrying out PCR and interpreting the results

Advantages

There are no analogs in Ukraine.
The test enables quick, high-sensitive, and specific diagnostics and has a relatively low cost

IPR Protection

IPR1, IPR2

Stage of Development. Suggestion for Commercialization

IRL5, TRL5
Trial samples production clinical tests, upon request

Contact Information

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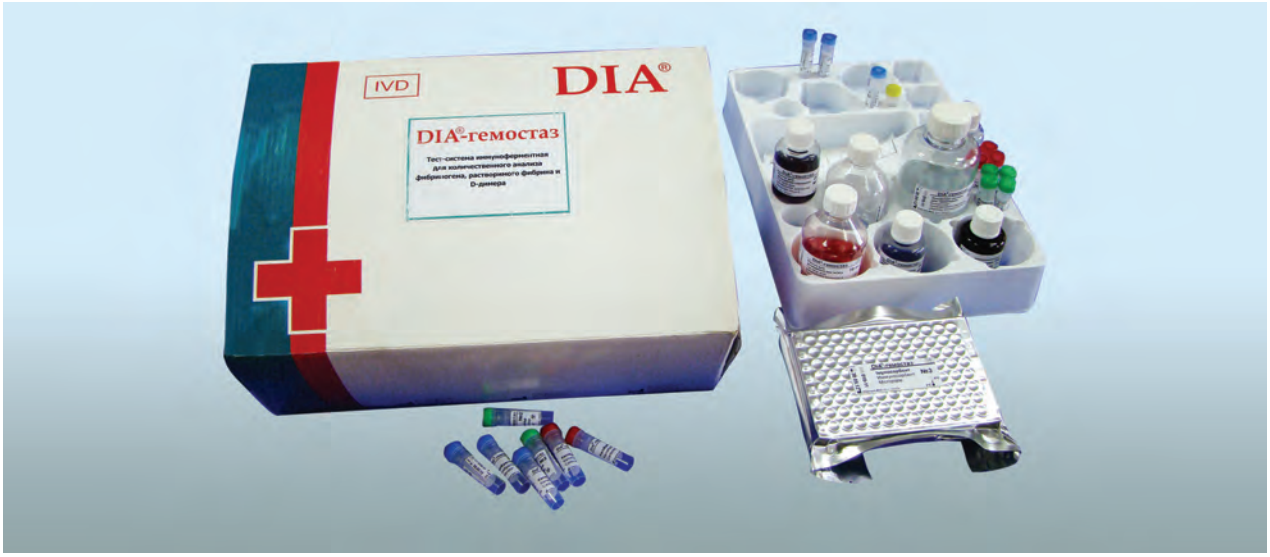
DIA-HEMOSTASIS IMMUNOENZYME TEST SYSTEM FOR SIMULTANEOUS QUANTIFICATION OF FIBRINOGEN, SOLUBLE FIBRIN, AND D-DIMER IN HUMAN BLOOD PLASMA



Areas of Application

This integral test system can be used for simultaneous quantification of fibrinogen, soluble fibrin, and d-dimer in human blood plasma in order to make comprehensive diagnosis of the hemostasis system, to detect or to prevent the thrombosis risk under various pathologies at the early stages of disease, to monitor antithrombotic and fibrinolytic therapy in cardiology, surgical and obstetric practice, combustiology, oncology, and endocrinology

Specification

High sensitivity (0.5 ± 0.1 μg/ml); high specificity (98%); time of analysis: 3 hours; automated parameter quantification; long-term storage life. The test system has been trialed in leading clinics of Ukraine and has shown positive results

Advantages

There are no analogs. As compared with the known test systems based on expensive commercial antibodies, this test system uses highly specific monoclonal antibodies of our own production

Stage of Development. Suggestion for Commercialization

IRL8, TRL8
Seeking partners for mass production and marketing

IPR Protection

IPR3

Contact Information

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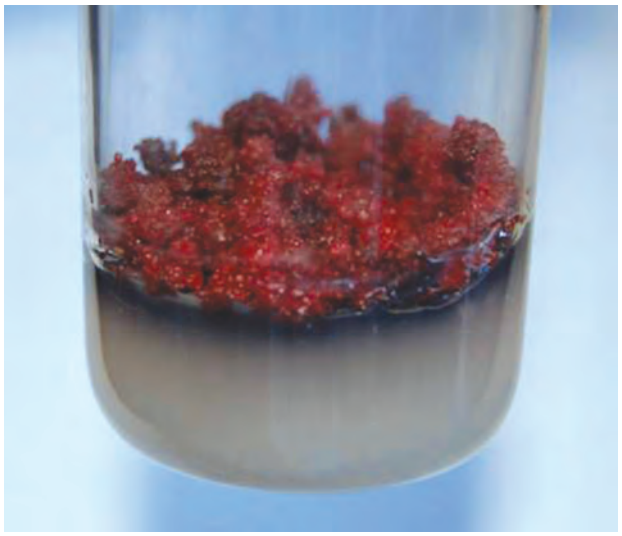
ECHIUM PLANTAGINEUM TISSUE CULTURE SOURCE OF SHIKONIN, A NAPHTHOQUINONE COMPOUND WITH A BROAD SPECTRUM OF THERAPEUTIC ACTION



General view of *Echium plantagineum* L. tissue culture, the producer of shikonin

Areas of Application

The culture is used for obtaining shikonin, a red naphthoquinone pigment having antibacterial, antitumor, antiviral, anti-inflammatory, and wound healing action and preventing scars formation. As dye shikonin used in cosmetic, textile, and food industries

Specification

The high-yielding strain of *Echium plantagineum* tissue culture contains 8% shikonin on dry weight basis. The cycle of culture growth is 14—20 days. The yield of dry shikonin biomass is 6,4—8.5 g/l

Stage of Development. Suggestion for Commercialization

IRL3, TRL3
Dry biomass of Echium plantagineum tissue culture for production of extracts with shikonin provided upon request. Seeking partners for scaling up Echium plantagineum biomass tissue culture and producing shikonin

IPR Protection

IPR2

Advantages

Echium plantagineum tissue culture has no analogs in Ukraine. There are no sources for shikonin obtainment in Ukraine. As compared with other herbal wound-healing medicines, the shikonin-based drugs prevent scars formation. The cost of shikonin obtained in Ukraine is lower by 30% as compared with foreign analogs

Contact Information

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EKVZ-300 PATONMED® DEVICE FOR LIVE TISSUE WELDING

Areas of Application

The device is designed for high-frequency welding, coagulation, and cutting of soft live tissues in surgery. It is used in general abdominal surgery, traumatology, pulmonology, proctology, urology, mammology, otolaryngology, gynecology, vascular surgery, parenchymal organs, ophthalmology, veterinary medicine etc.

Specification

Certified for the use at Ukrainian medical institutions. State certificate No. 14574/2015.

Power supply	220 V 50 Hz
Max. power, W	300
Operating frequency, Hz	440

Advantages

Enables fast bloodless surgical interventions with no-ligature closure of vessels and absence of bleeding, without necrotizing burns, convenient for the surgeon and low-traumatic for the patient; reduces blood loss by 60—85%; shortens surgery time by 20—50%; high ablastics of interventions in cancer patients; enables low-invasive interventions in sensitive and hard-to-reach areas; surgical treatment of patents considered inoperable; shorter and more complete post-surgery rehabilitation

Stage of Development. Suggestion for Commercialization

IRL7, TRL8
Manufacture, supply,
and warranty service, upon request

IPR Protection

IPR3

Contact Information

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ELECTROPHYSICAL COMPLEX FOR NEUTRON THERAPY

Special box for neutron therapy

Cyclotron neutron generator

Areas of Application

The complex in designed to generate neutrons for implementing the cutting edge methods of cancer treatment based on the interaction of radiation-sensitive drugs and neutrons — nuclear capture therapy. These methods cannot be realized unless there is sophisticated and unique nuclear physics equipment

Specification

The complex is based on four powerful electrophysical devices of INR, which are capable of generating neutron fluxes having various density and energy, depending on the needs of advanced nuclear medicine. About 600 patients annually can be treated using this complex

Advantages

There no counterparts in Ukraine. The complex has as good performance as the advanced foreign neuron therapy devices

IPR Protection

IPR1

Stage of Development. Suggestion for Commercialization

IRL5, TRL5
Neutron therapy of malignant neoplasms

Contact Information

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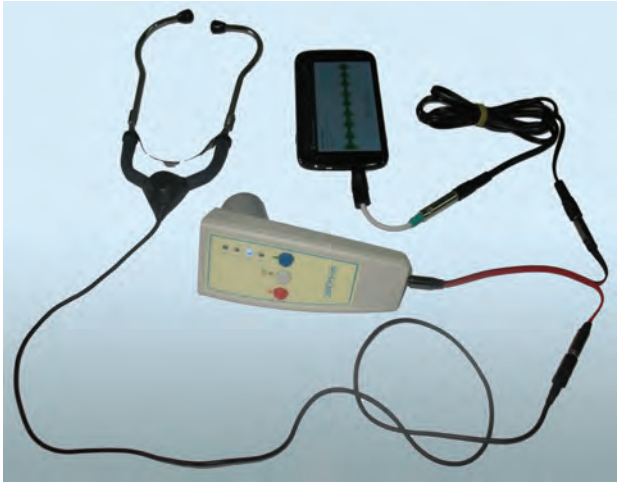
EPHON-08 ELECTRONIC STETHOSCOPE HARDWARE AND SOFTWARE COMPLEX

Areas of Application

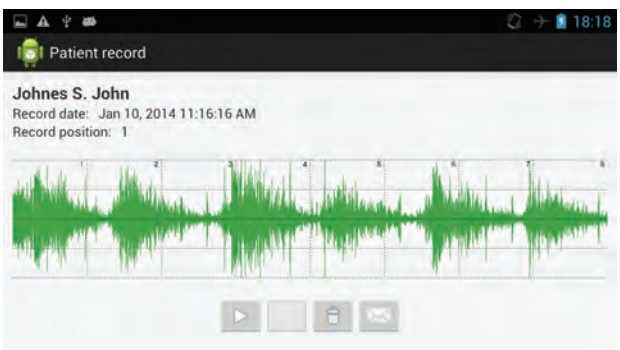
The *EPhON*-08 Electronic Stethoscope is designed for listening to patient's respiratory and cardiac sounds in medical diagnostics

Specification

The device consists of signal receiver and amplifier, headphones, connecting cables, and special software. The electronic amplification (four levels with a 6 dB step) and its frequency filtering adjustable with the use of buttons on the main panel ensure comfortable listening to respiratory and cardiac sounds. LED indication is used for visual control of the operation mode. *EPhON*-08 can operate individually or in coupling with a tablet or smartphone. This enables to document the patient's data, to record the phonograms, and to send them via Internet allowing medical staff to monitor, including remotely, the dynamics of disease



EPhON-08 electronic stethoscope coupled with a smartphone



Run screen of stethoscope software

IPR Protection

IPR1

Stage of Development. Suggestion for Commercialization

IRL3, TRL4
Seeking partners to produce the industrial models of stethoscope

Advantages

The ability of coupling with a wide range of devices provides the functionality comparable to that of commercial electronic stethoscopes at a much lower price. The software enables its flexible upgrade and addition of new features

Contact Information

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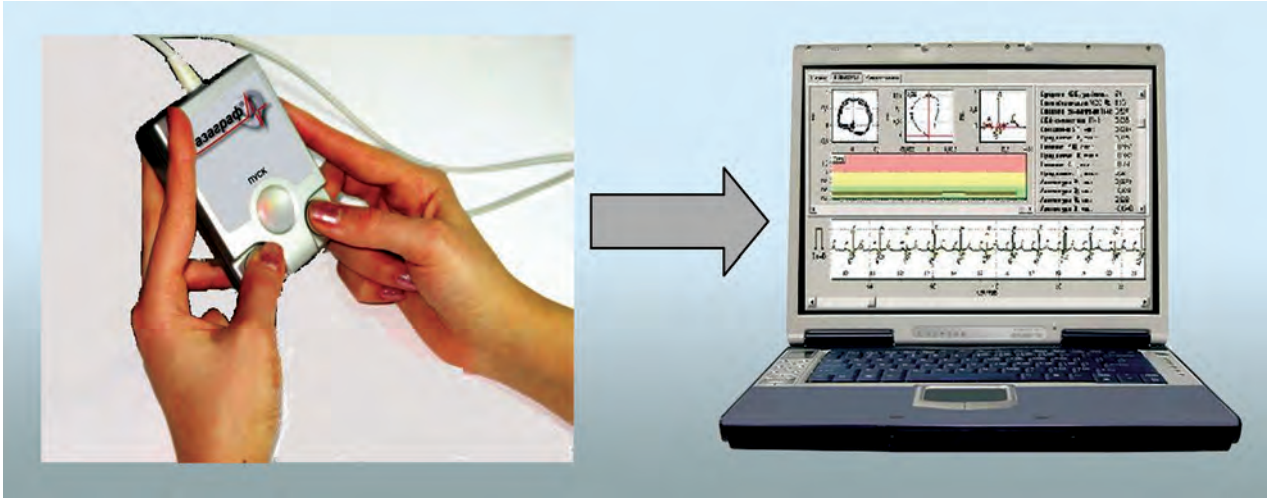
FASEGRAPH® DEVICE FOR PREVENTIVE AND CLINICAL MEDICINE



Areas of Application

The device is to be used at medical, educational, sports institutions, at home and in the field conditions to evaluate the functional state of the cardiovascular system, including to make screening for coronary heart disease; to carry out mass preventive surveys; to obtain additional diagnostic information during exercise tests; to control the cardiovascular dynamics in the treatment of cardiological diseases

Specification

The device consists of a microprocessor sensor for recording electrocardiograms (ECG) using finger electrodes and computer programs based on innovative method for ECG processing.
The test duration is 2 minutes.
The sensitivity and specificity exceed 93%

Advantages

Unlike the known analogs, *FASEGRAPH*® enables to determine subtle changes in signal, which give additional diagnostic information, but are not taken into account in the conventional traditional ECG diagnosis

Stage of Development. Suggestion for Commercialization

IRL6, TRL8
Manufacture, supply, warranty service, and staff training, upon request

IPR Protection

IPR1, IPR3

Contact Information:
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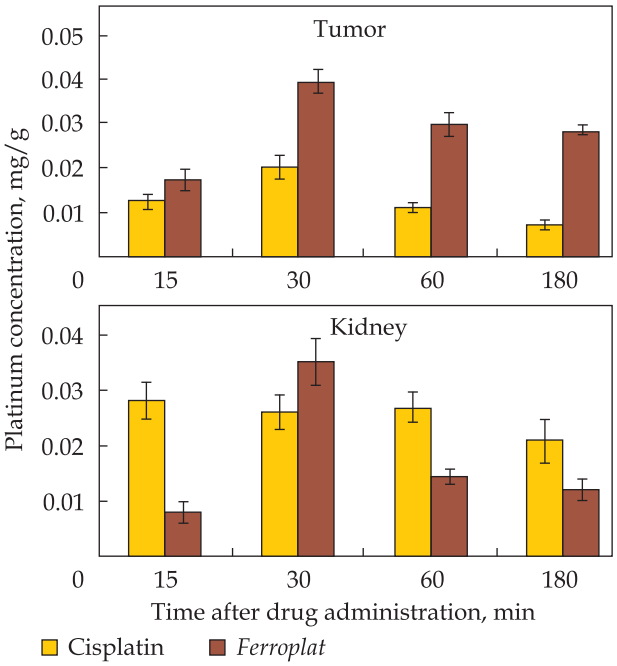
FERROPLAT ANTITUMOR NANOCOMPOSITE

Areas of Application

Ferroplat can be used to increase the effectiveness of chemotherapy and to overcome drug resistance of malignant tumors. *Ferroplat* is a means to deliver cytotoxic agents directly to the tumor tissue, which provides their maximum penetration into the cells and improves their therapeutic effect

Specification

Ferroplat antitumor ferromagnetic nanocomposite is a conjugate of magnetic fluid nanoparticles and anticancer drug cisplatin



Ferroplat pharmacokinetics

Advantages

Ferroplat has no analogs. It has significant pharmacological advantages over the free form of cisplatin. It is able to be selectively accumulated in the tumor and to improve the antitumor effect of cisplatin with increased biosafety. Unlike the conventional chemotherapy, *Ferroplat* is more active against the tumors resistant to cytotoxic drugs and shows less toxicity towards the normal cells. The administration of *Ferroplat* helps to prevent the toxic influence of cytostatic on the whole organism

Stage of Development. Suggestion for Commercialization

IRL4, TRL4
Seeking investors for developing a process description and organizing commercial manufacture

IPR Protection

IPR1, IPR3

Contact Information

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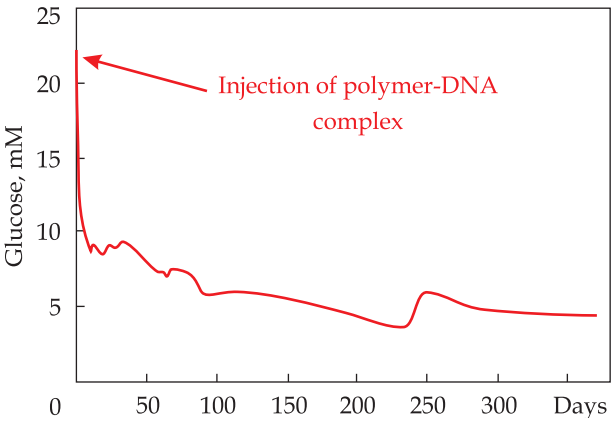
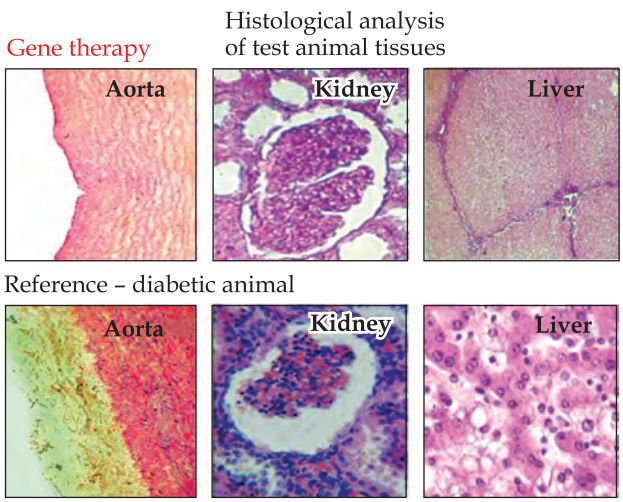
GENE THERAPY FOR TYPE I DIABETES MELLITUS





Long-term euglycemia after intrahepatic administration of polymer-DNA complexes in diabetic Landrace pig

Areas of Application

The drug is used for the treatment of type I diabetes in endocrinology medical institutions

Specification

The drug is based on polycations and recombinant DNA complexes containing the human preproinsulin gene. The preparation is prepared ex tempore, before administering. The pilot experiments with gene therapy for type I diabetes have been conducted. Positive results of treatment in long-term studies have been obtained

Advantages

There are no analogs in Ukraine.
A single gene drug administration provides a long-term effect unlike the conventional treatment of type I diabetes mellitus with lifelong daily exogenous insulin injections to patients. The drug manufacturing costs are cheaper than those of similar foreign preparations based on the use of viruses for carrying therapeutic genes. This drug is safer since it is based on non-viral gene transfer system

IPR Protection

IPR2

Stage of Development. Suggestion for Commercialization

IRL3, TRL2
Seeking for partners for preclinical tests

Contact Information

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GLYCIVIT C DIETARY SUPPLEMENT

Areas of Application

Glycivit C dietary supplement is used as additional source of glycine and L-ascorbic acid (vitamin C) for normalization of the functional state of nervous and immune systems, bone and connective tissues, as well as for general health improvement

Specification

Glycivit C is manufactured in glycine and vitamin C based capsules of 500 mg ±7.5%. One capsule contains *active ingredients*: 400 g glycine, and 50 mg vitamin C (ascorbic acid); subsidiary substances: microcrystal cellulose, calcium stearate, amorphous silicon dioxide (orisil), maltodextrin as *fillers*; and *capsule membrane of* gelatin

Advantages

There are no analogs in Ukraine. *Glycivit C* effectively improves the organism adaptation to unfavorable environmental factors, enhances the immune system, intensifies the regeneration of bone and connective tissues, activates the biosynthesis processes, slowdowns the aging, speeds up alcohol detoxification, prevents fragility of blood vessels, and has detoxification properties. Inexpensive and easy to manufacture

IPR Protection

IPR2

Stage of Development. Suggestion for Commercialization

IRL7, TRL7
Manufactured, upon request.
Seeking partners for mass production

Contact Information

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HELICOTESTER DEVICE FOR NONINVASIVE RAPID DIAGNOSTICS OF STOMACH HELICOBACTERIOSIS

Specification

The device consists of a detector based on ammonia sensor, data processing, control, and display systems, and a built-in air pump for air intake. The device detects an increase in ammonia concentration in mouth cavity after administration of carbamide that is a diagnosis parameter depending on the quantity of *Helicobacter pylori* bacteria in stomach. The *HELICOTESTER* device has been registered by State Service of Ukraine on Drugs

Areas of Application

HELICOTESTER is designed for noninvasive detection of abnormally high amounts of *Helicobacter pylori* bacteria by direct urease test and for preventive screening of population (including schoolchildren) for stomach helicobacteriosis

Advantages

There are no analogs in Ukraine.
High sensitivity, inexpensive equipment, ease of use; noninvasive and rapid testing; early diagnosis of helicobacteriosis

Stage of Development. Suggestion for Commercialization

IRL6, TRL7
Manufactured, upon request. Seeking partners for mass production

IPR Protection

IPR1, IPR3

Contact Information

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HELIOS LASER THERAPEUTIC AND PROPHYLACTIC MULTIFUNCTIONAL COMPLEX

Areas of Application

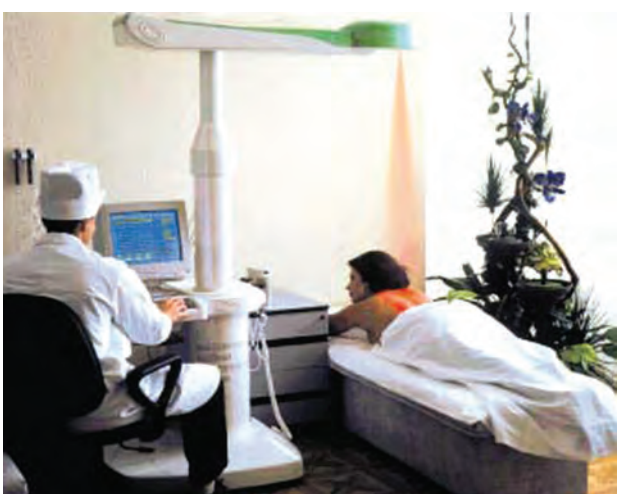
The equipment is designed for the treatment and prevention of over 100 nosological groups of diseases and syndromes

Specification

The complex uses all laser therapy methods and techniques known in medical practice. The complex consists of 7 functionally independent systems: 6 therapeutic laser systems for external and internal, contact and contactless treatment and a system for rapid diagnosis of functional state of the patient. One laser system can simultaneously serve up to 7 patients with different modes of treatment and prevention. Software is used for the management of patent database and the laser system. The basic module weight is 60 kg; power is 220 V

Advantages

High integration of facilities; provides a wide choice of scanning shapes and automatic calculation of dose rate



Patient diagnosis using the *Helios* system

Stage of Development. Suggestion for Commercialization

IRL8, TRL9
Production sample. Sale of equipment. Manufacture, customization, testing, supply, warranty service of equipment, and staff training, upon request. Creation of technological framework for manufacturing the base model. Sample finalization and serial production. Further upgrade of production and optimization of solutions to customize the product to the needs of sales markets

IPR Protection

IPR1, IPR3

Contact Information

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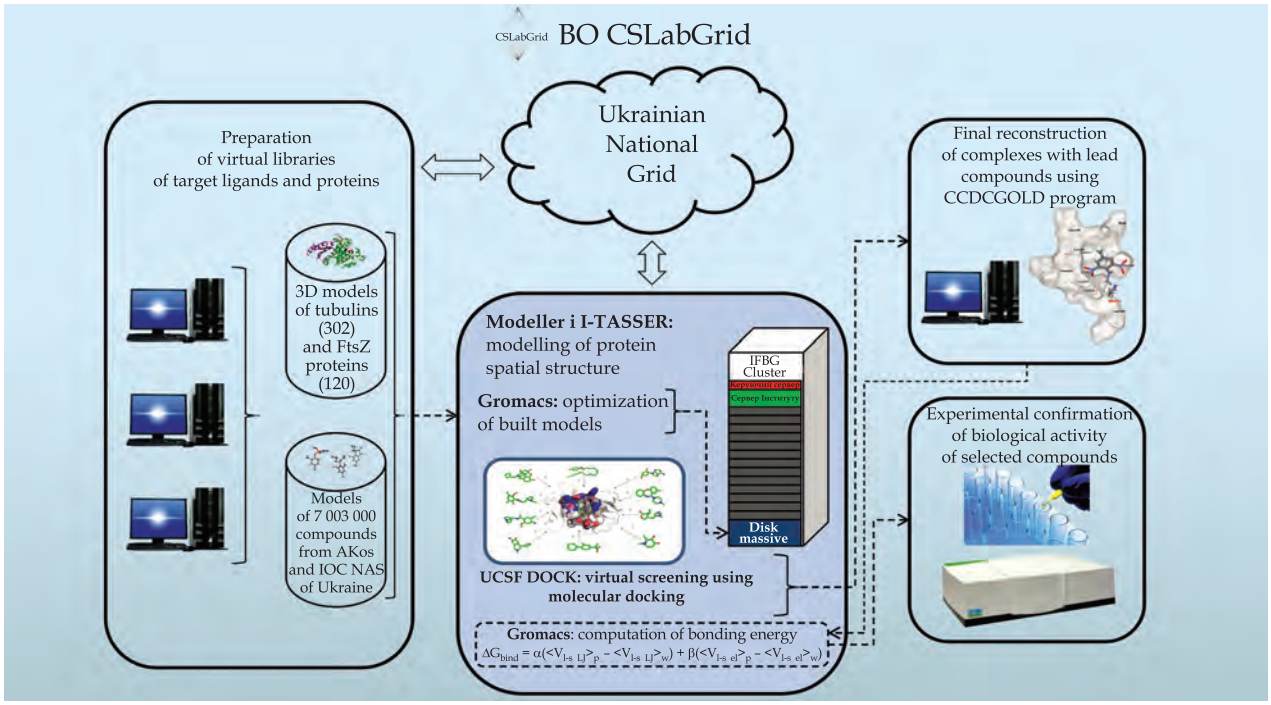
HIGH-THROUGHPUT SCREENING OF BIOLOGICALLY ACTIVE SUBSTANCES WITH ANTIBACTERIAL AND ANTIMITOTIC ACTION



Areas of Application

The method is designed to reduce cost and to speed up searching substances with antibacterial and antimitotic action

Advantages

The used approach enables to significantly reduce financial and time inputs for searching new antibacterial and antimitotic agents and to open prospects for creating new drugs with protozoacide, anthelmintic, antitumor, fungicide, and herbicide action

IPR Protection

IPR1, IPR3

Specification

A complete process cycle for high-throughput screening of biologically active substances with antibacterial and antimitotic effect, which act as inhibitors of tubulin and its bacterial homologue FtsZ protein; the cycle includes virtual screening of multimillion ligand libraries in Grid and lab verification of biological properties of selected lead compounds.
There is a working model able to perform tasks in command line mode

Stage of Development. Suggestion for Commercialization

IRL3, TRL1
Seeking investors for the creation of respective services and interfaces

Contact Information

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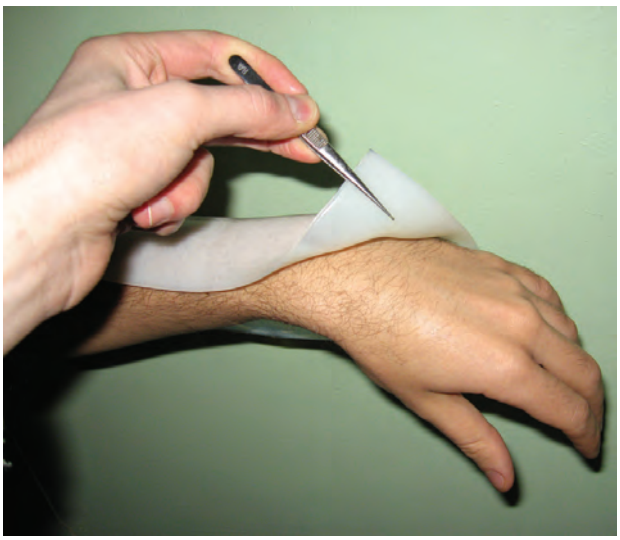
HYDROGEL DRESSINGS FOR PROMOTED HEALING OF WOUNDS AND BURNS

Areas of Application

Used in medicine, dermatology, cosmetology, veterinary medicine to treat burns, ulcers, infected and festering wounds with different exudation and affected area



Specification

The line of products with different composition of medicinal substances depending on purpose has been developed. Dressing is an opaque elastic sheet. Its dimensions can vary from 80×80×2 mm to 160×250×2 mm, 2 mm thick; swelling: 150—250%; vapor permeability: 4.85—5.9 mg/cm^2 · h

Advantages

The hydrogel dressings are 2—5 times cheaper than the world analogs, have prolonged therapeutic effect due to desorption of biologically active substances. Their plasticity ensures a complete simulation of the wound surface. The dressings provide equal therapeutic effect on the whole area of the wound, do not stick to wounds and healthy skin, can be safely removed or changed, don`t cause allergic reactions and don`t contain any toxic components

Stage of Development. Suggestion for Commercialization

IRL5, TRL4
The product and manufacturing technology are completely ready to start up the production according to the prepared business plan. Small batches manufactured upon request. Investments are needed for passing state certification procedures and building a pilot production line

IPR Protection

IPR3

Contact Information

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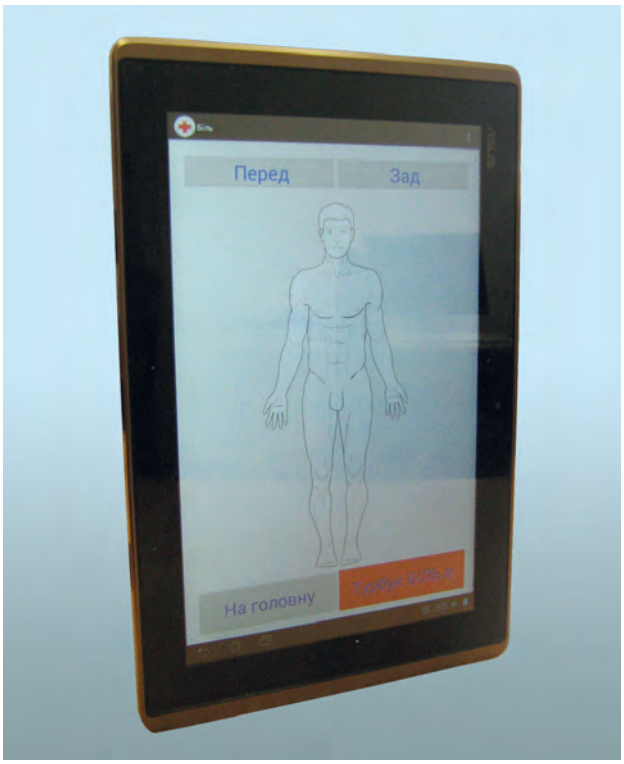
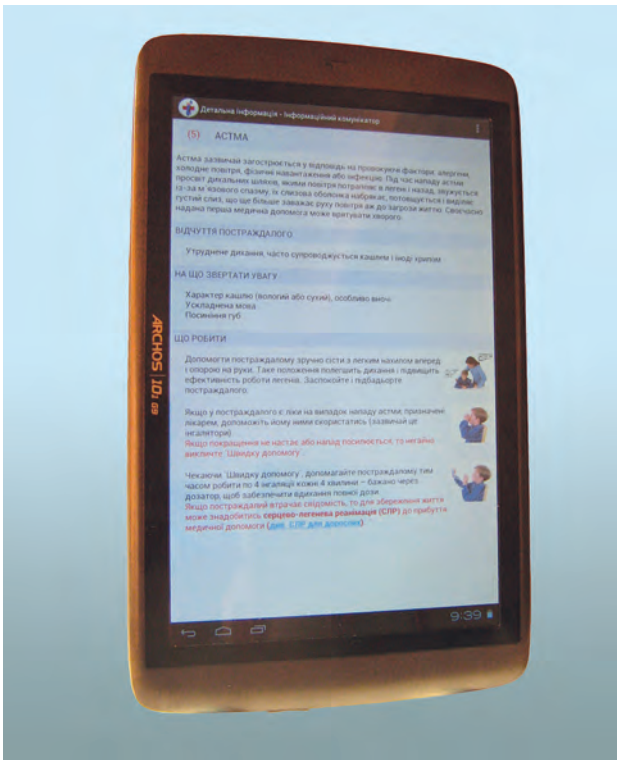
INFORMATION COMMUNICATOR FOR MEDICAL APPLICATION





Areas of Application

The information communicator is designed for communication between therapist and patient or injured person who lost speech as a result of disease, injury or trauma, in hospitals

Specification

Based on tablet computer operated by Android 4.0.

Sensor monitor, inches	10
Processor clock frequency, GHz	1.2
RAM, MB	512
ROM, GB	4
Weight, g	≤360

IPR Protection

IPR3

Advantages

There are no counterparts in the world. The communicator has sensor interface; can be customized by extending options to improve communication between therapist and patients

Stage of Development. Suggestion for Commercialization

IRL7, TRL8
Manufacture, delivery, warranty maintenance, and staff training, under the license agreement

Contact Information

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INTRAOCULAR LENSES

Areas of Application

The hydrophobic flexible intraocular lenses are used for implantation as substitutes for the eye lens

Specification

Optically transparent material;
transparency in UV region, % — <2;
enhanced biocompatibility;
antimicrobial properties.
The lenses have passed toxicological examination and clinical tests

Advantages

The intraocular lenses match the known foreign analogues in terms of biocompatibility and mechanical properties, but have a lower cost.
The intraocular lenses have adjustable characteristics of the surface layer and enhanced UV protective properties

IPR Protection

IPR1

Stage of Development. Suggestion for Commercialization

IRL6, TRL6
Seeking partners for production

Contact Information

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ISATHIZONE ANTIVIRAL DRUG

Areas of Application

Isathizone is used in medicine, for the treatment of human viral diseases: herpes viruses, herpes zoster and others and in veterinary medicine, for the treatment of diseases of animals and birds (Marek's disease, avian infectious laryngotracheitis, bronchopneumonia in horses and calves, etc.)

Specification

Isathizone is methisazone (marboran) in polyethylene glycol solution. The drug has been approved for the use in veterinary medicine 10.04.02 No. 15-14/105. The use of izatizon on in vitro and in vivo models and on volunteers has shown a high antiviral action in comparison with the imported drugs

Stage of Development. Suggestion for Commercialization

IRL8, TRL8
Seeking partners for clinical trials. Manufactured and dosing schedule provided, upon request

Advantages

As compared with the imported drugs, isathizone is much cheaper, shows a high therapeutic effect, has immunomodulating properties and no side effects

IPR Protection

IPR1, IPR2

Contact Information

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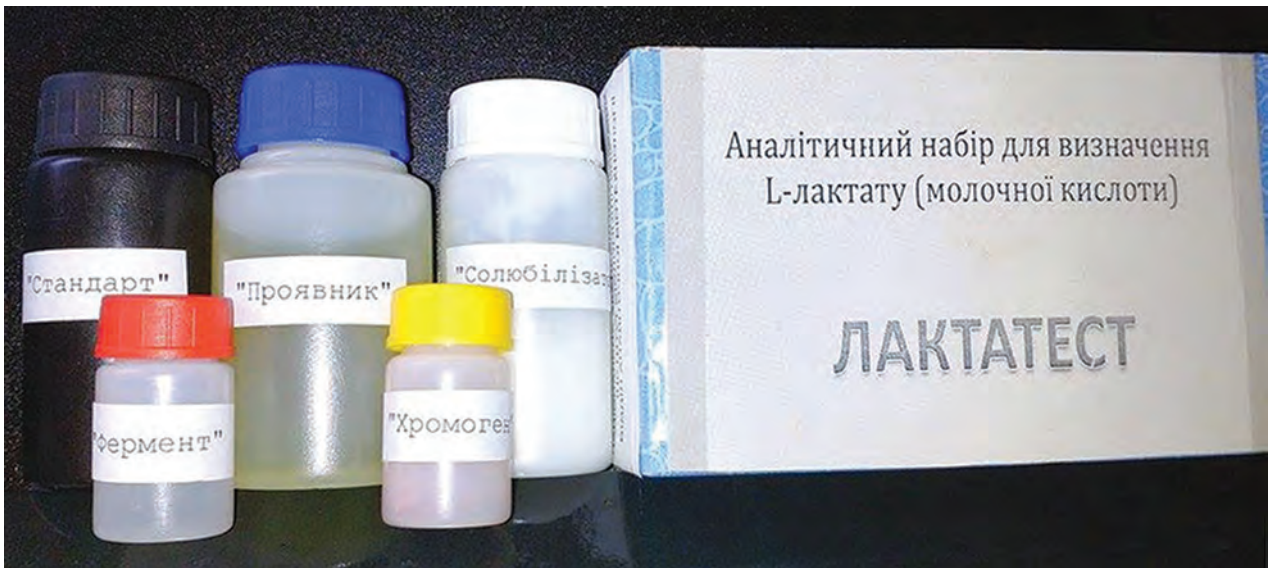
LACTATEST ENZYMATIC KIT FOR DETERMINATION OF LACTIC ACID IN BIOLOGICAL FLUIDS



Areas of Application

The kit can be used in clinical diagnostics for assessing severity and effectiveness of treatment of pancreatic diabetes, myocardial infarction, and acidosis; in fermentation industry for control of contamination of raw materials and quality of final products; in sports medicine for control of effectiveness of training sessions

Specification

The kit is based on unique yeast ferment that ensures a high accuracy of detecting lactic acid in biological samples. It is inexpensive and does not contain any toxic substances

Advantages

There are no counterparts in Ukraine. As compared with the foreign analogs, *LACTATEST* is 3—4 times cheaper, easier-to-use in terms of sample preparation and analysis, does not require expensive equipment and special staff training

Stage of Development. Suggestion for Commercialization

IRL5, TRL5
Manufactured and supplied, upon request; instructions for use

IPR Protection

IPR3, IPR5

Contact Information

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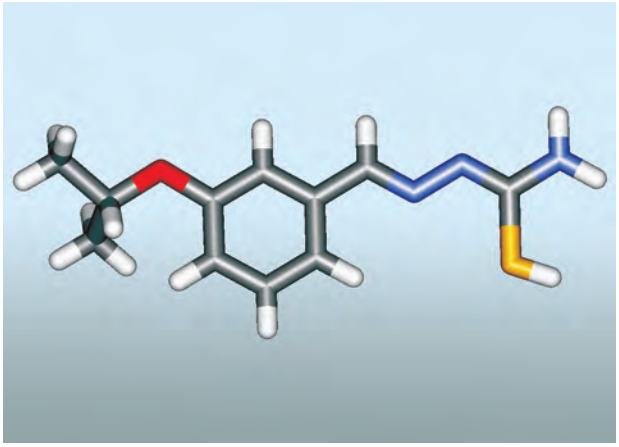
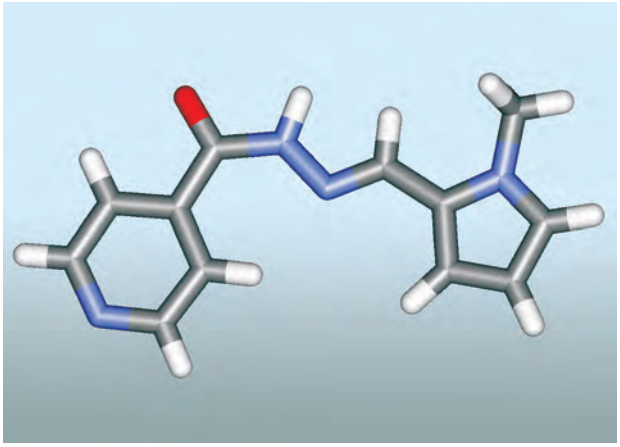
+38 032 261 21 44, e-mail: stasyk@cellbiol.lviv.ua

LOW-MOLECULAR COMPOUNDS WITH ANTITUBERCULOSIS ACTION



a



b

Chemical structure of 3-isopropoxy benzaldehyde thiosemicarbazone (*a*) and N′-[1E)-1-methyl-1H-pyrrol-2-yl)methylene]isonicotinic hydrazide (*b*)

Areas of Application

Low-molecular compounds with antituberculosis action

Advantages

The developed compounds act on the strains of Mycobacterium tuberculosis that are stable to known commercial antituberculosis drugs, in particular, isoniazid, rifampin, and ofloxacin

Specification

Chemical names:3-isopropoxybenzaldehyde thiosemicarbazone (1) and N′-[1E)-1-methyl-1H-pyrrol-2-yl)methylene]isonicotinic hydrazide (2). The compounds inhibit the growth of *Mycobacterium tuberculosis* in aerobic conditions with MIC = 0.79 μM (compound 1) and 0.39 μM (compound 2); the compounds are not cytotoxic with respect to cellular line of human liver HepG2; penetrate through the monolayer of Caco-2 cells, which is *in vitro* model of the mucous membrane of human small intestine for predicting drug absorption; the binding with proteins of blood plasma makes up 86.8 and 42.1 for compounds 1 and 2, respectively

Stage of Development. Suggestion for Commercialization

IRL2, TRL2
Seeking partners for preclinical/clinical trials. The ready offering can be proposed to pharmaceutical corporations

IPR Protection

IPR2

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MAGNETIC INSTRUMENT FOR REMOVING FOREIGN METALLIC BODIES

Areas of Application

The magnetic instrument can be used in surgery, traumatology, battle-field surgery, and disaster medicine for diagnosing and removing foreign metallic ferromagnetic bodies having a size up to 25 mm

Specification

The instrument has titanium headpieces of various shape with magnets inside. It can be sterilized by chemical and gas methods. The kit consists of magnetic multifunctional surgical instrument for diagnosing and removing metallic ferromagnetic fragments; magnetic probe for inspecting and measuring the wound channel while detecting, localizing and removing small fragments of foreign bodies; surgical magnet on a flexible handle for removing hard-to-reach fragments and for treating the wounds with nonlinear wound tracks; etc. The number of instruments in the kit depends is customized

Advantages

The tool is unique for Ukraine and has the following advantages: quick diagnostics of the presence of foreign metallic ferromagnetic bodies; removal of fragments from wounds having nonlinear tracks; three times reduction of surgical intervention and anesthesia time; surgical intervention is less traumatic; can be used in the battle-field environment

Stage of Development. Suggestion for Commercialization

IRL6, TRL7
Manufactured and supplied, upon request

IPR Protection

IPR3

Contact Information

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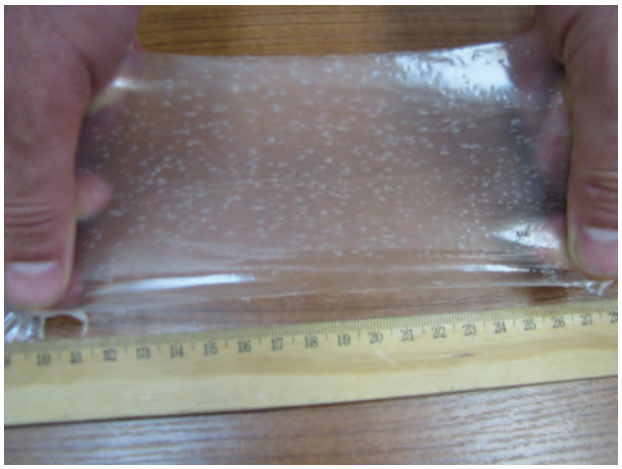
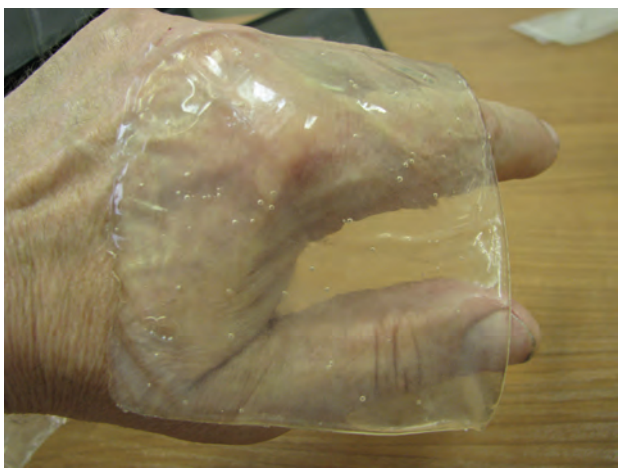
MEDICAL BANDAGE MADE OF HYDROGELS CROSSLINKED BY RADIATION



General view of medical bandage



Elastic deformation of medical bandage before rupture reaches 50—100%

Areas of Application

The bandage is used for treatment of wounds, burns, and skin diseases protecting them from mechanical stress and infections, cooling, anaesthetizing, disinfecting, creating and maintaining a wet environment, infusing pharmacological agents, and absorbing wound discharge

Specification

The medical bandage is a sterile plate of soft elastic nontoxic material having a thickness of 2—4 mm and different sizes ranging from 5×5 to 20×30 cm. It is able to absorb physiological discharge from wounds up to 150% of its initial weight

Advantages

The medical bandage does not cause any irritation or allergic reactions, does not stick to the wound, which enables its painless replacement. Transparency of bandage enables to observe the wound condition without its removal. The bandage can contain a variety of water-soluble drugs and infuse them into the wound.
The medical bandages of this type are not produced in Ukraine. Manufacturing medical dressings based on the proposed technology provides ~100% profitability insofar as its price is 2—3 times cheaper than the imported counterparts

Stage of Development. Suggestion for Commercialization

IRL6, TRL6
The product and technology are completely ready for launching the production based on prepared business plan. Investments are needed to paying state certification fees and for building a pilot manufacturing line

IPR Protection

IPR1, IPR3

Contact Information

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MEDICAL MATERIALS BASED ON TI-NB-SI SYSTEM

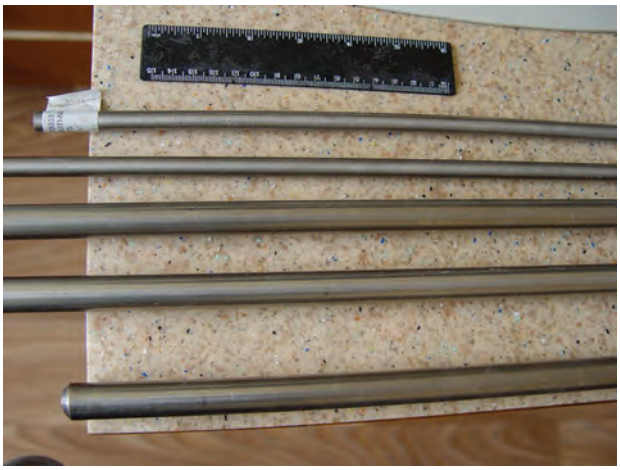
Areas of Application

The materials are to be used for manufacturing bone implants, prostheses, and metallic structural parts for osteosynthesis

Specification

The materials are passing are pre-clinical tests.

Ultimate tensile strength, MPa	1050—1250
Yield stress, MPa	850—1050
Elongation, %	7—12
Elastic modulus, MPa	70—100



Rods

Advantages

The mechanical properties of Ti-Nb-Si alloys are as good as or even better than those of conventional titanium alloys of medical application. The alloys are osteoactive and promote osteoinduction in the areas of interface between the material and the bone tissue. The materials have passed preclinical trials

Plates

Stage of Development. Suggestion for Commercialization

IRL4, TRL4
Seeking partners for organization of manufacturing bone implants, endoprostheses, and various products for osteosynthesis

Screws

IPR Protection

IPR2, IPR5

Contact Information

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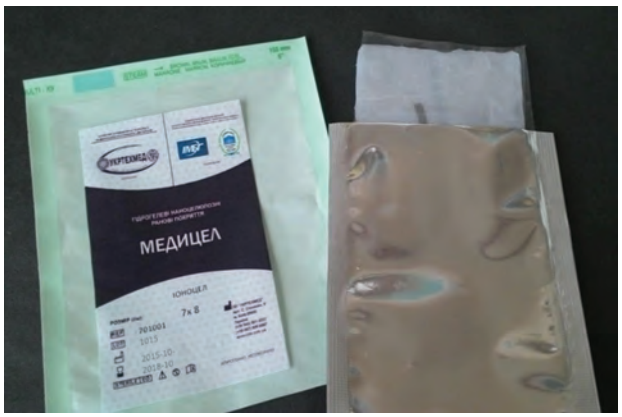
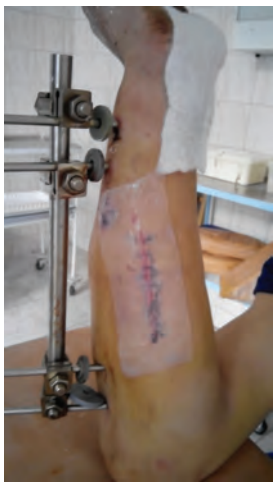
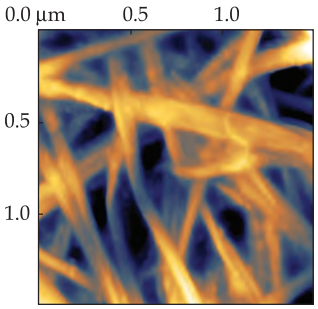
MEDICEL NANOCELLULOSE WOUND AND BURN HEALING HYDROGELS



Hydrogel cellulose dressing



Application of cellulose hydrogels instead of gauze



Nanofibrils of bacterial cellulose

Areas of Application

The *MEDICEL* products are wound dressings for the treatment of skin injuries and burns in both field and clinical conditions. The dressings provide a repair of damaged tissue, anti-inflammatory, hemostatic, anesthetic actions, and transdermal delivery of drugs

Specification

The *MEDICEL* products are manufactured in the form of flexible sterile nonwoven cellulose-based hydrogel dressings of two types (microcidic and hemostatic). They have a thickness of 1.8—2.4 mm and a size of 2 × 15, 5 × 8, and 14 × 20 cm; a high moisture-retaining (99%) and sorption capacity as well as a high steam and gas permeability

Advantages

The *MEDICEL* wound dressings are atraumatic and painless dressings as compared with the gauze. The cellulose hydrogels take the shape of the wound and cover it tightly; they are biocompatible, nontoxic, and biodegradable as compared with the chemical ones. The *MEDICEL* products match the foreign analogs, but have a lower cost

Stage of Development. Suggestion for Commercialization

IRL7, TLR6
At this stage, the product and production technology are fully prepared for launching a pilot line

IPR Protection

IPR3

Contact Information

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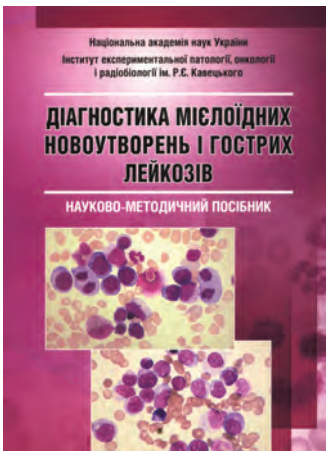
METHOD FOR DIAGNOSING THE TUMORS OF HEMATOPOIETIC AND LYMPHOID TISSUES

Areas of Application

The method is used for diagnosing the tumors of hematopoietic and lymphoid tissues

Specification

The cytological and immunocytochemical diagnostic surveys are made directly in blood and bone marrow smears or thin-needle bioptates using a broad panel of monoclonal antibodies. The method enables obtainment of permanent preparations and precise determination of immunophenotype using conventional light microscopy. The technology is accessible for hematological establishments in Ukraine, which are not equipped with high-cost devices. The validity of the innovative product has been approved at several oncohematological clinics in Ukraine



Guidelines for advanced diagnosis of oncohematological diseases and atlas for diagnosis of tumors of hematopoietic and lymphoid tissues

Advantages

There are no analogs manufactured in Ukraine. Similar diagnostic standards are available only in European oncohematological centers. The method enables high-standard diagnostic surveys in Ukraine thus substantially reducing their cost as compared with that in western countries

Stage of Development. Suggestion for Commercialization

IRL7, TRL7
Complex diagnostic examinations upon request. Staff training for starting up the diagnostic laboratories

IPR Protection

IPR1, IPR3

Contact Information

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METOVITAN PREPARATION FOR ENHANCING ORGANISM VIABILITY

Areas of Application

The preparation is used for preventing toxic liver damages (drugs, alcohol, etc.) and for treating immunodeficiencies of various origins, infectious diseases, diabetes, drug addiction, in the case of physical and mental stresses, nervous disorders, metabolic disorders, negative changes in cell processes upon exposure to ionizing radiation

Specification

The drug is based on the composition of biologically active substances: vitamins E, B_1 (in the form of thiamine chloride or thiamine bromide), PP (in the form of nicotinamide, nicotinic acid or its other derivative), methionine and zinc in the form of chloride, sulfate or acetous salt in the corresponding quantitative ratio. There have been positive results of clinical trials obtained

Advantages

Vitamin-mineral preparation has no analogs in Ukraine and CIS countries. It has a complex effect: hepatoprotective, energy-stimulating, and cardioprotective

Stage of Development. Suggestion for Commercialization

IRL8, TRL8
Manufactured, upon request.
Seeking partners for mass production

IPR Protection

IPR3

Contact Information

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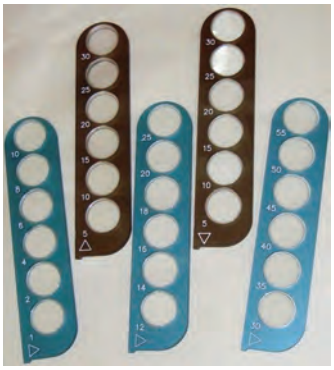
MICROPRISM STRUCTURES FOR DIAGNOSIS AND TREATMENT OF STRABISMUS

KK-42 diagnostic set

Separate microprism compensators for strabismus



DSSC-1 set of diagnostic bars with microprisms

Areas of Application

The KK-42 microprism set of compensators for strabismus and DSSC-1 set of diagnostic bars with microprisms are used for measuring the angle of strabismus and for diagnosing eye diseases. The prism-sphere-cylinder (PSC) eye glasses are designed for the treatment of strabismus

Specification

The KK-42 diagnostic set consists of 42 separate hermetically sealed rigid microprisms with a prismatic strength ranging from 0.5 to 30.0 prism diopters (PD). The DSSC-1 set of diagnostic bars with microprisms is designed for a range of 1-55 PD. The developed new PSC glasses have a prismatic component up to 30 PD

Advantages

The designed sets are unique for Ukraine and CIS countries. Unlike the known world analogs, the design of new microprism devices is hermetically sealed, so the microprism optical strength does not change during operation and microrelief is protected from external damages and dirt. The optical compensators are formed by two microprism elements, so the prisms strength does not change while turning the device along its axis

IPR Protection

IRP3

Stage of Development. Suggestion for Commercialization

IRL8, TRL8
Manufacture of diagnostic sets and bars, upon request; manufacture of PSC glasses upon doctor prescriptions. Seeking partners for making international protection documents

Contact Information

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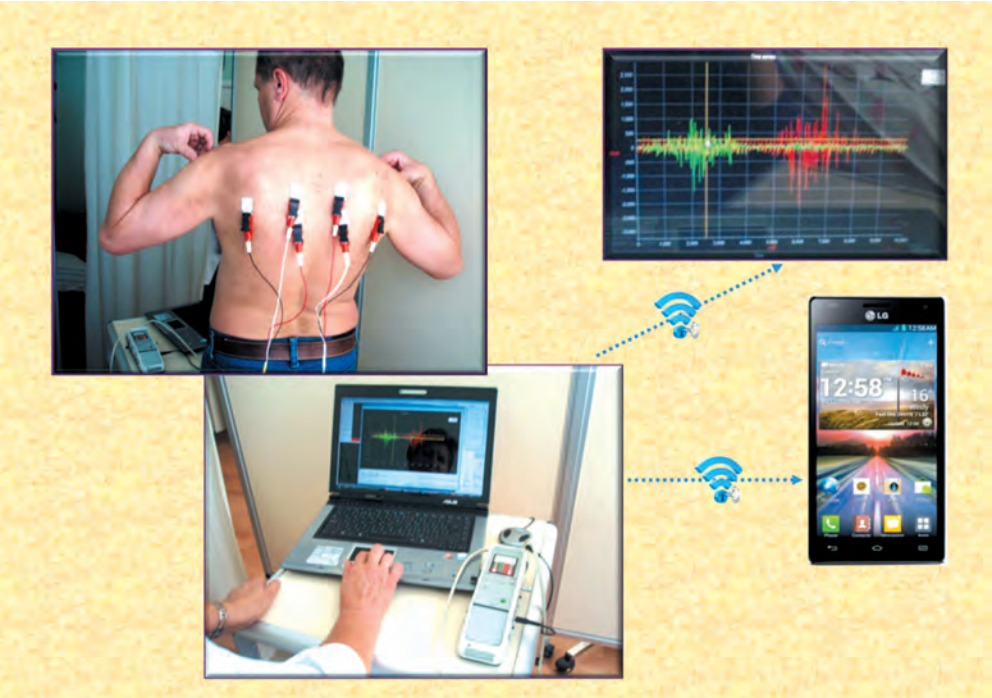
MIOBALANCECOR HARDWARE AND SOFTWARE COMPLEX FOR DIAGNOSIS AND CORRECTION OF POSTURE DISORDERS



Correction of back muscle tone asymmetry based on EMG signal monitoring

Areas of Application

The device is designed for quick diagnosis and correction of balance muscle activity, including symmetric back muscles tone in scoliosis, for tracking and correction of posture disorders. Can be used at clinical institutions, schools, universities, offices, and at home

Stage of Development. Suggestion for Commercialization

IRL3, TRL4
Seeking partners for financial support of industrial production of the complex

IPR Protection

IPR1, IPR2

Specification

The diagnosis and correction of posture disorders are based on biofeedback (BFB) and mioelectrostimulation. The device has 2 channels for perception and analysis (in PC structure) of electromyography (EMG) signals of symmetrical muscles and 2 channels for mioelectrostimulation using original programs

Advantages

The device has no counterparts. *MioBalanceCor* uses original programs for correction of posture based on mioelectrostimulation. In the case of posture disorders, using these programs, selective electrical stimulation of muscles is carried out in order to reduce scoliosis and to strengthen muscle corset

Contact Information

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MN-MULTI-TEST SYSTEM FOR IDENTIFICATION OF MUTATIONS IN THE PATIENTS WITH MYELOID NEOPLASMS

Areas of Application

The system is designed for differential molecular genetic diagnosis of myeloid neoplasms at the medical establishments of the Ministry of Healthcare of Ukraine and for the detection of BCR/ABL1 chimeric gene; mutations in BCR/ABL1kinase domain, mutations of JAK2 gene, CALR gene; and MPL gene

Specification

The system contains a set of specific oligonucleotide primers and protocols for their use. The system has been tested on clinical samples at several establishments of the Ministry of Healthcare of Ukraine

Advantages

There are no analogs in Ukraine. The system enables comprehensive differential molecular genetic diagnosis of myeloid neoplasms and matches the world counterparts, but has a lower cost

Stage of Development. Suggestion for Commercialization

IRL3, TRL5
Preparation for industrial production and staff training, upon request

IPR Protection

IPR1, IPR2, IPR3

Contact Information

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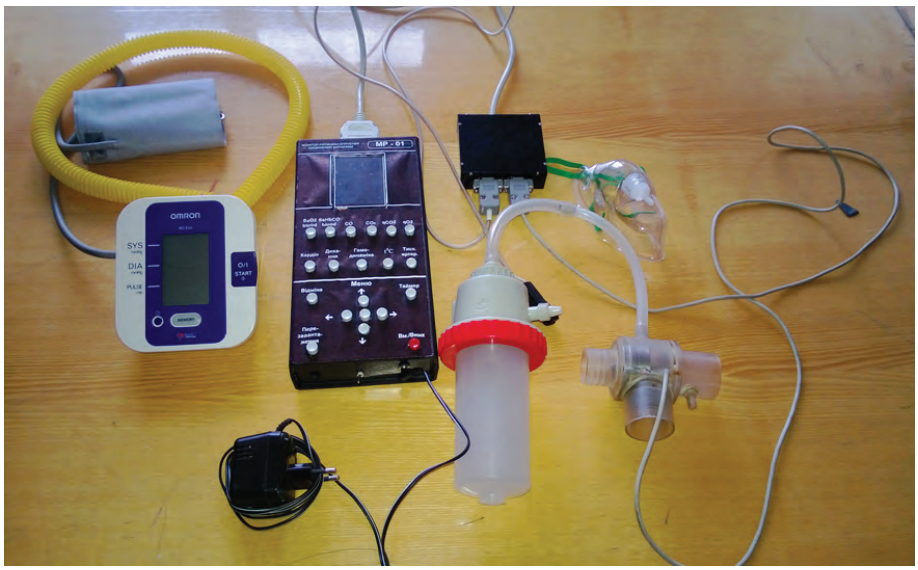
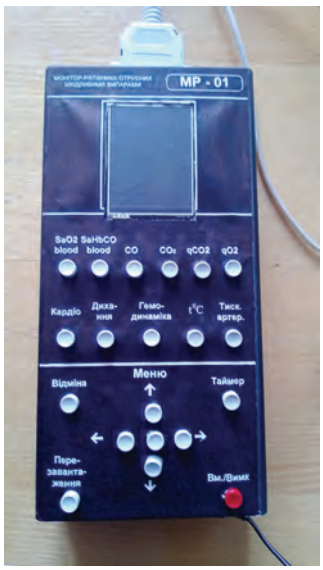
MONITOR FOR MEASURING THE POISONING WITH CARBON MONOXIDE AND NOXIOUS FUMES (HEMOGLOBIN BLOCKERS)





Monitor of poisoning with carbon monoxide and noxious fumes (hemoglobin blockers) — general view (left) and measuring unit (right)

Areas of Application

The device is used for comprehensive diagnosis of the state of injured people in the course of rescue operations, as well as for emergency and intensive care. It enables to evaluate the condition of cardiovascular and respiratory systems affected by hemoglobin blockers, including carbon monoxide

Advantages

No devices for noninvasive measurement of blood saturation with carboxyhemoglobin are manufactured in Ukraine. Similar foreign portable devices have far fewer functions at a much higher cost

Stage of Development. Suggestion for Commercialization

IRL4, TRL4
Manufacture, supply, warranty service, and staff training, upon request

IPR Protection

IRP3

Specification

The device has three-level alarm, operates up to 6 hours without recharge.

Blood oxygen saturation, %:	
range	70—100
error	±2
resolution	1
Blood carbon monoxide saturation, %:	
range	0—30
error	±2
resolution	1
Heart rate, beat/min:	
range	25—250
error	±1
resolution	1
Blood flow velocity, cm/s:	
range	0-60
error	±1
Breathing frequency, breath/min:	
range	0—150
error	±1
Carbon monoxide from expiratory air, ppm:	
range	0—10000
error	±10
resolution	2
Carbon dioxide from expiratory air, ppm:	
range	0—10000
error	±10
resolution	2

Contact Information

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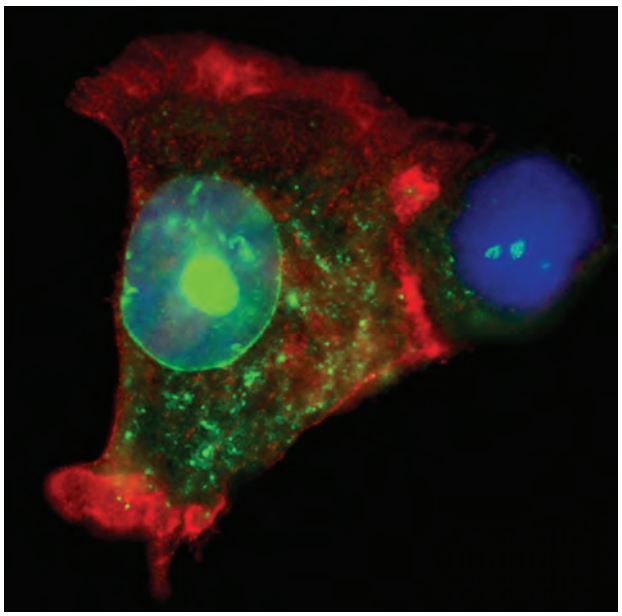
MONOCLONAL ANTIBODIES FOR CANCER DIAGNOSTICS

Areas of Application

Early diagnostics of cancer and leukemia.
Differential diagnostics of tumors.
Immune status evaluation. AIDS monitoring.
Monitoring of the therapy effectiveness

Specification

The kits of purified monoclonal antibodies produced by hybridomas. The hybridoma collection includes producers of monoclonal antibodies against CD3, CD4, CD7, CD8, CD10, CD13, CD15, CD16, CD20, CD22, CD25, CD27, CD34, CD37, CD38, CD43, CD45, CD45RA, CD48, CD54, CD56, CD66e, CD95, CD150, CD227, CD326, HLA-ABC, HLA-DR, kappa and lambda light Ig chains, pan-cytokeratin, cytokeratin-18, p53, and antigen of proliferating cells IPO-38. This antibody panel has been recorded in the State Register of Medical Equipment and Medical Devices of Ukraine and approved for the application in medical practice (permanent license)



Application of monoclonal antibodies in immunofluorescent microscopy

Advantages

There are no analogs in Ukraine.
The specificity and quality of monoclonal antibodies are as good as those of the foreign analogues, but have a substantially lower price

Catalog of monoclonal antibodies

Stage of Development. Suggestion for Commercialization

IRL8, TRL7
Monoclonal antibodies manufacture, purification, specificity testing, supply, quality assurance, and staff training, upon request

IPR Protection

IPR1, IPR3

Contact Information

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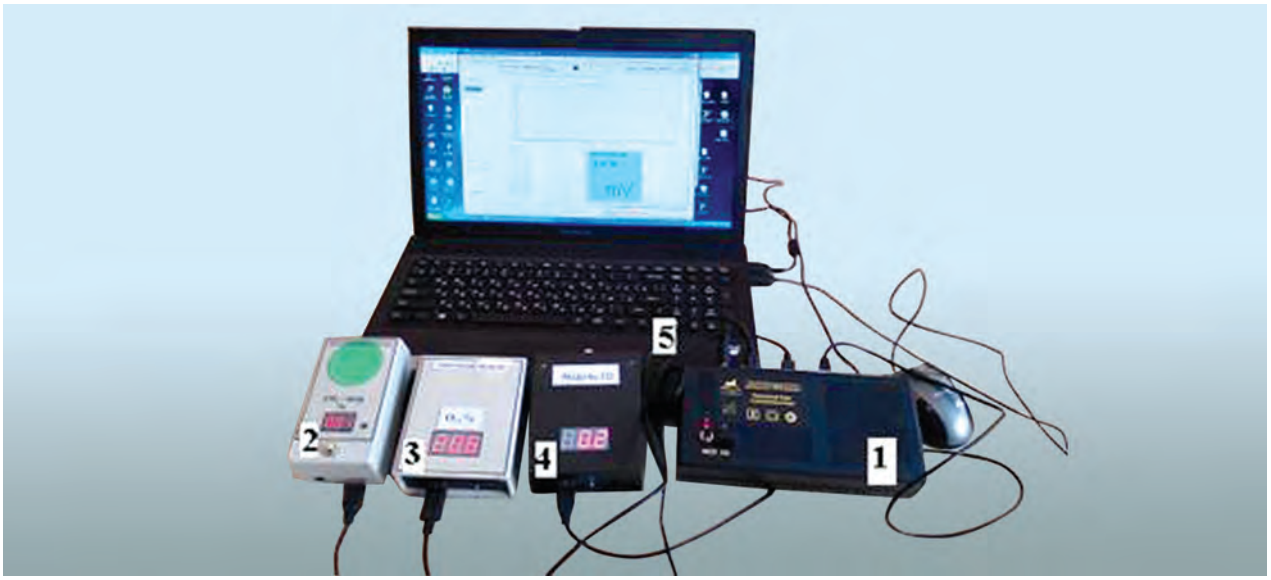
MULTISENSOR GAS ANALYZER



View of device: 1 — electronic unit; 2, 3, 4 — sensor modules CO_2, O_2, CO, 5 — personal computer

Areas of Application

The device is to be used at healthcare centers to identify bronchopulmonary, cardiovascular, gastrointestinal, and other diseases, to control the content of harmful gases in production buildings, to monitor environment, and to rapidly assess the human health and workability. The analyzer can be used in both stationary and field conditions

Advantages

Unlike the domestic and foreign counterparts, the device is 2—3 times cheaper, portable, enables to study changes in gas concentration in real time

IPR Protection

IPR3

Specification

Three sensor modules (O_2, CO_2, CO); possibility to connect up to 8 different sensor modules that can also work individually, for measuring ethanol, acetone, temperature, humidity, pressure, and gas flow rate.

Measurement time, s	10—60
Range of concentration, %	
CO_2	0—5 error 0.5
O_2	0—21 error 0.5
CO	0—1 error 0.5
Service life, years	10

Stage of Development. Suggestion for Commercialization

IRL5, TRL5
Manufacture of small series, supply, warranty maintenance, and staff training, upon request

Contact Information

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PALLADIUM BISPHOSPHONATES AS NEW NONTOXIC ANTICANCER DRUGS

Areas of Application

The compounds are to be used for curing bone cancer and metastases in patients with breast, prostate, thyroid, and lungs cancer

Specification

When introduced into the patient body, the synthesized compounds of palladium bisphosphonate acids are locally concentrated in the bone tissue. They deactivate tumor cells and prevent bone metastases

Advantages

Palladium bisphosphonates are substances with targeted action, which accumulate in bone damage areas. They have the same antitumor activity as classical cis-platinum, but possess a much lower toxicity; not affect kidney, liver, spleen; inhibit the growth of cancer cells and block the development of metastases. Due to this they enhance the efficiency of medical treatment and lower its cost

Stage of Development. Suggestion for Commercialization

IRL3, TRL3
Seeking investors for clinical trials, organization of manufacture, and marketing

IPR Protection

IPR2

Contact Information

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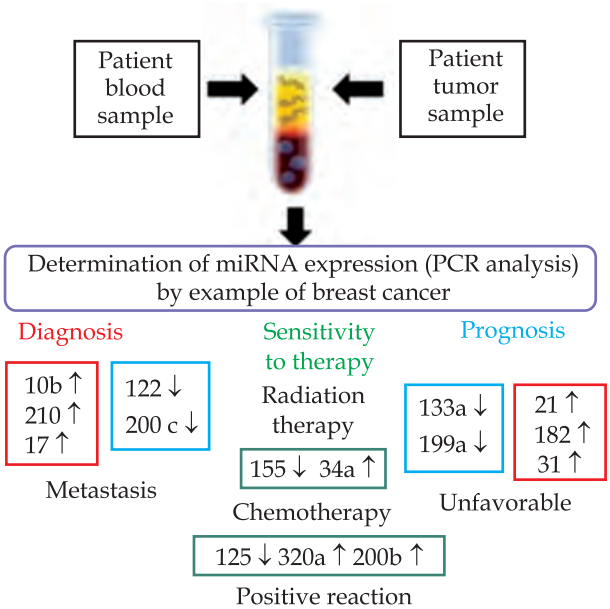
PANEL OF BIOMARKERS FOR PERSONALIZED CANCER MONITORING



Algorithm for personalized cancer monitoring

Areas of Application

The panel is designed for personalized monitoring of tumor, adjustment of treatment regimens and improvement of the life quality of cancer patients

Specification

The method is based on a new class of highly sensitive, tissue-specific epigenetic tumor markers — miRNAs and analysis of their dependence on and correlation with characteristics of molecular tumor profile

Advantages

Impo rtant advantages of miRNAs over other biomarkers are their stability, selectivity, and specificity to a particular type of cancer. The microRNA analysis provides comprehensive information about tumors (risk of recurrence, degree of malignancy, sensitivity to chemotherapy, hormone therapy, and radiotherapy, etc.). The proposed panel of biomarkers is informative, highly sensitive, and enables time saving

Stage of Development. Suggestion for Commercialization

IRL5, TRL6
Personalized monitoring with the use of proposed tumor biomarker panel, upon request

IPR Protection

IPR1, IPR3

Contact Information

Tatiana V. Pyatchanina, RE Kavetsky Institute of Experimental Pathology, Oncology and Radiobiology of the NAS of Ukraine; +38 044 259 01 67, e-mail: tanya_pyatchanina@ukr.net

PHOTONUCLEAR TECHNOLOGIES FOR MEDICAL ISOTOPE PRODUCTION

Radiochemical laboratory

Areas of Application

^{99m}Tc, ^{67}Cu, ^{95m}Pt are medical isotopes for diagnostics and therapy of diseases, including cancer

Specification

Daily yield of medical isotopes:

- ^{99m}Tc: 1—4 Ci
- ^{67}Cu: 0.3 Ci
- ^{195m}Pt: 50—100 mCi

Advantages

The photonuclear production technology is an environment friendly technology. It doesn't require using nuclear reactors for isotope production and will compensate for a production decline that can be a result of shutdown of research nuclear reactors. Ukraine does not have its own production of medical isotopes. ^{99m}Tc is one of the most common isotopes for diagnostics of cancer, cardiac diseases, etc. ^{67}Cu, ^{195m}Pt are promising isotopes for the creation of new radio pharmaceuticals

Stage of Development. Suggestion for Commercialization

IRL5, TRL5
Seeking investors for preclinical, clinical trials and production

IPR Protection

IPR3

Contact Information

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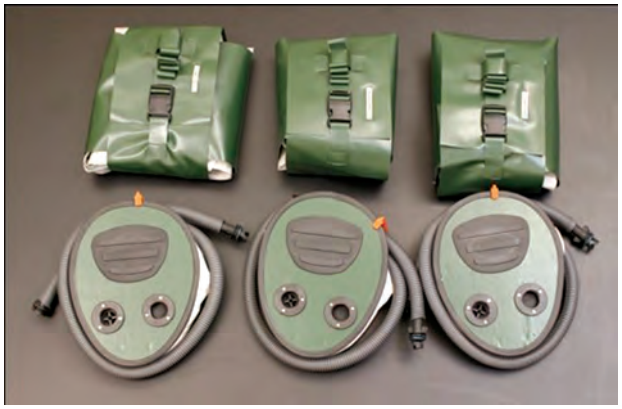
+38 057 335 68 43, +38 057 349 10 49, e-mail: pugach@kipt.kharkov.ua

PNEUMATIC SPLINTS



Pneumatic splint kits

Areas of Application

The pneumatic splints are to be used in military and emergency medicine for temporary immobilization of injured parts of human body in order to minimize traumatic effects and to enable patient transportation to medical station

Specification

The pneumatic splints are a set of high-pressure receptables made of reinforced polymeric films and connected together

Pneumatic splint for limb immobilization

Advantages

The pneumatic splints have an increased ability to minimize a traumatic effect during transportation of injured person; their manufacture can be cheaper as compared with the existing analogs

Pneumatic splint for hip joint immobilization

Stage of Development. Suggestion for Commercialization

IRL8, TRL7
Transfer of license and technical documentation for manufacture; in the case of investments, launch of production line

IPR Protection

IPR3

Contact Information

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PORTABLE 99MO/99mTC GENERATOR

Plant for Mo-Zr gel synthesis

99Mo/99mTc generator

Areas of Application

The portable 99Mo/99mTc generator is to be used at hospitals. Sodium pertechnetate-99mTc is radiopharmaceutical widely used in nuclear medicine for the diagnosis of tumors in various locations and non-tumor pathologies of the body

Specification

The generator working material is Mo-Zr-gel synthesized using 99Mo obtained through irradiating natural molybdenum oxide by neutrons from WWR-M research reactor of INR of the NAS of Ukraine. The physical and chemical properties of sodium pertechnetate-99mTc meet the requirements of the European Pharmacopoeia

Advantages

Not manufactured in Ukraine;
cheaper than the foreign analogs

Stage of Development. Suggestion for Commercialization

IRL4, TRL4
Manufactured and supplied, upon request

IPR Protection

IPR1

Contact Information

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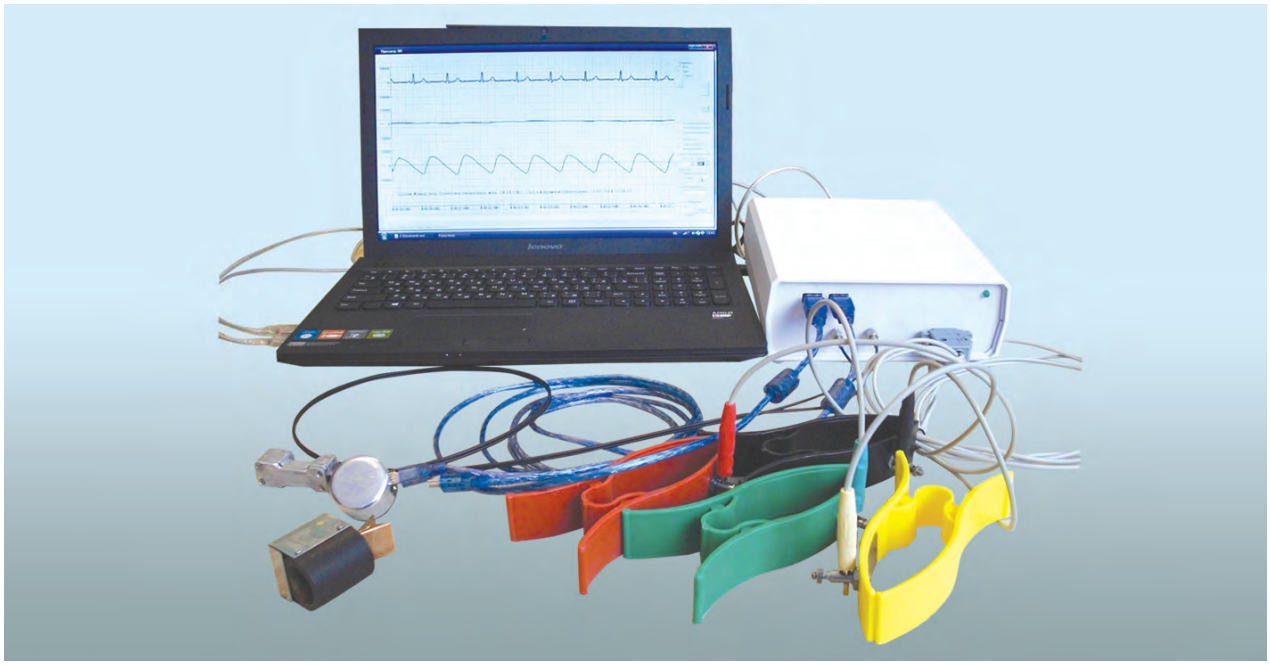
+38 044 525 43 50, e-mail: vtryshyn@kinr.kiev.ua

PORTABLE ECG PHOTOMETRIC COMPLEX



Areas of Application

The complex is designed for the use in civilian and military medicine, disaster medicine, sports and labor medicine for the combined diagnosis of myocardium and vegetative nervous system, vascular and noninvasive measurements of hemoglobin

Specification

Digital ECG with 6 leads; double-channel photometric device; hemoglobinometer; specialized software package for signal analysis and diagnosis; bandwidth, patients per hour: 8; service, years: 10; clinically tested, certified for compliance

Advantages

There are no counterparts in Ukraine; the device is 2—3 times cheaper as compared with the foreign competitors; is portable, able to work in both clinical, outpatient, and in field conditions; uses the most advanced methods of 4th generation ECG, advanced ECG codes, and pulsometry indicators

Stage of Development. Suggestion for Commercialization

IRL6, TRL6
Manufacture of small series, supply, warranty maintenance, and staff training, upon request

IPR Protection

IPR3, IPR4

Contact Information

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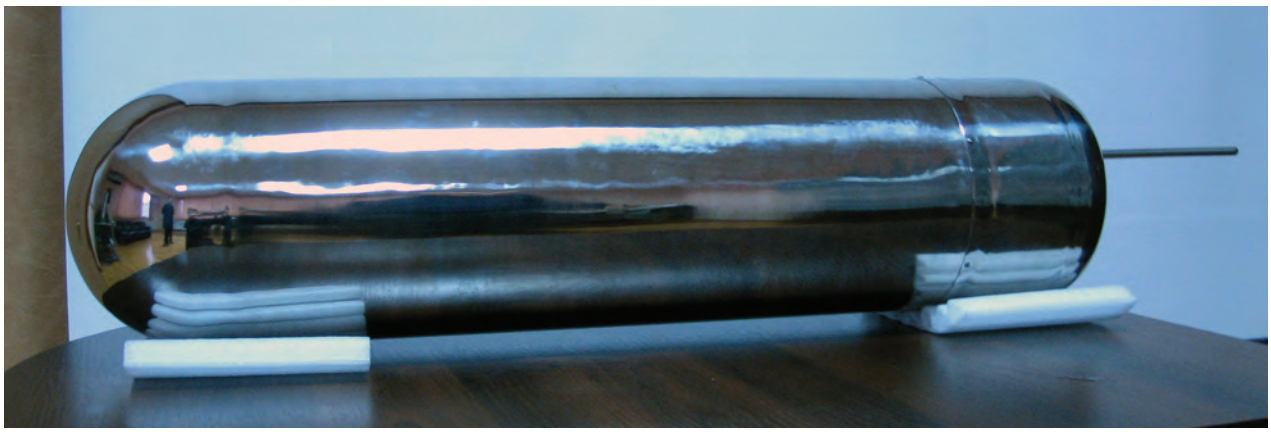
+38 044 526 41 78, e-mail: ErshovSV@nas.gov.ua

PORTABLE FAST NEUTRON GENERATOR



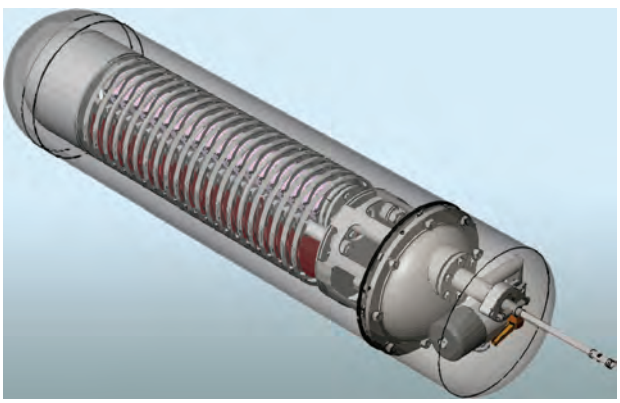
Portable fast neutron generator (prototype in operation)

Areas of Application

The device is to be used in medicine
for brachytherapy of rectum cancer,
uterine cancer etc., and for neutron therapy

Specification

Power consumption, W	120 (220 V or 48 V)
Neutron flow, n/s	$3 \cdot 10^9$
Deuteron acceleration voltage (max), V	$6 \cdot 10^5$
Deuteron current, mA	30—35



Portable fast neutron generator

Advantages

The portable fast neutron generator
is an alternative to research nuclear reactors
used for neutron therapy. Due to its mobility
and significant reduction in infrastructure
and equipment cost both at the construction
and at the commissioning stages,
the neutron generator opens new
opportunities for creating neutron
therapy clinical departments

Stage of Development. Suggestion for Commercialization

IRL3, TRL4
Preparation of prototype for preclinical/clinical
trials; seeking partners for licensing
and certification of the neutron generator
as medical device, serial production
and introduction to Ukrainian
and foreign markets

IPR Protection

IPR1

Contact Information

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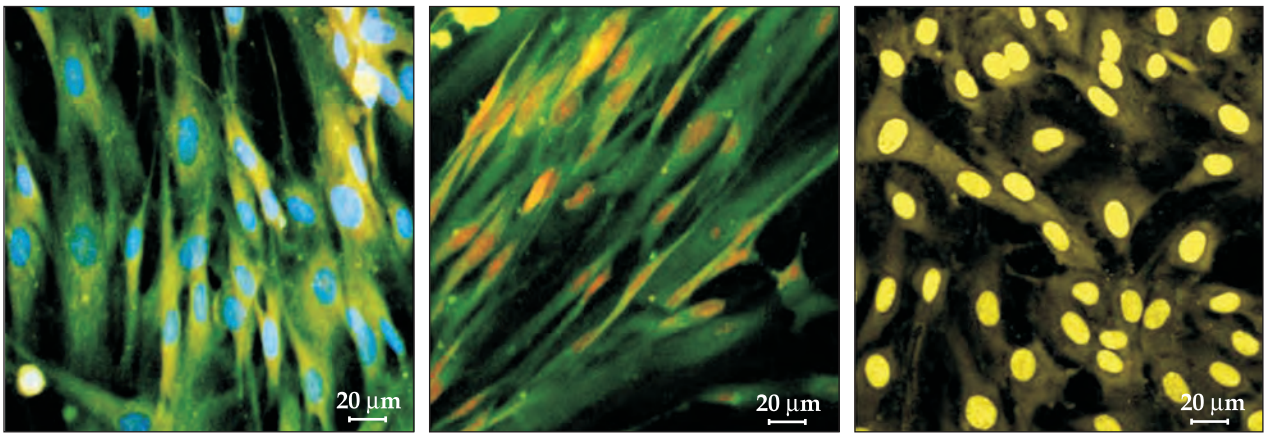
PREPARATION FOR CELL THERAPY



MSC culture. Confocal microscopy, various options of cells staining

Areas of Application

The preparation can be used at health care establishments for treating human diseases of various origins

Specification

A laboratory protocol for obtaining mesenchymal stem cells (MSC) from human umbilical cord and cultivating to the stage of their use in cell therapy has been developed. The preparation efficacy has been shown in pilot animal studies

Advantages

No domestic analogs exist. As compared with the foreign counterparts, the preparation is cheaper; obtainment and use of cells from umbilical cord meet moral and ethical standards, are safe and noninvasive. The preparation can be used both as allogeneic and autologous material for systemic and local application

Stage of Development. Suggestion for Commercialization

IRL3, TRL3
Seeking partners for preclinical and clinical trials. The completed preparation can be offered to pharmaceutical companies

IPR Protection

IPR2

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PREPARATION FOR LOCAL TREATMENT OF COMPLICATED DERMATOSES

Areas of Application

The preparation is a topical drug for external treatment of complicated dermatoses

Specification

The local use of preparation based on Teobon-Dithiomycocide (TD) and Gentamicin Sulfate (GS) for treating dermatoses complicated with fungal and bacterial infection facilitates a significant improvement of patient condition in 4—5 days, enables to reduce the treatment course down to 10—14 days. The preparation has no side effects and is well-tolerated. It has been tested in clinical conditions; does not cause any risk of complications as a result of corticosteroid administration

Advantages

The preparation based on antimycotic TD and antibiotic GS is as effective as the known reference drugs

Stage of Development. Suggestion for Commercialization

IRL6, TRL5
The technology is offered

IPR Protection

IPR1, IPR2

Contact Information

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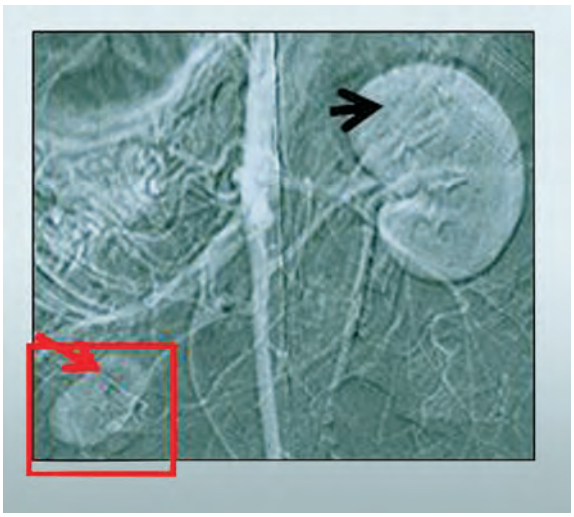
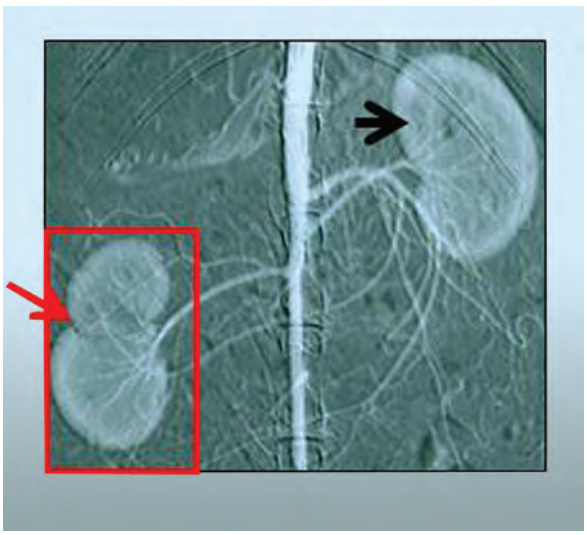
PREPARATION FOR RECOVERY OF REGIONAL BLOOD CIRCULATION IN ISCHEMIC KIDNEY

Reference: experimental ischemia



Experiment



The place of ligature application (kidney with experimental pathology)

Intact kidney (internal control)

Angiogram of rabbit urinary system vessels after application of ligatures and administration of developed preparation

Areas of Application

The preparation is to be used for correction of kidney blood circulation disorders and hypoxic and ischemic states in kidney parenchyma

Specification

The preparation contains fibroblast growth factor in complex with carrier based on modified crosslinked heparin as a means for correction of blood circulation in ischemic kidney.
The pilot tests have shown effectiveness of preparation for recovery of blood circulation in kidney with simulated ischemia under conditions of long-term experiment

Advantages

The key advantage is that the preparation enables recovering blood circulation in kidney when the surgical method is ineffective or impossible

IPR Protection

IPR3

Stage of Development. Suggestion for Commercialization

IRL3, TRL2
The preparation is ready for preclinical tests

Contact Information

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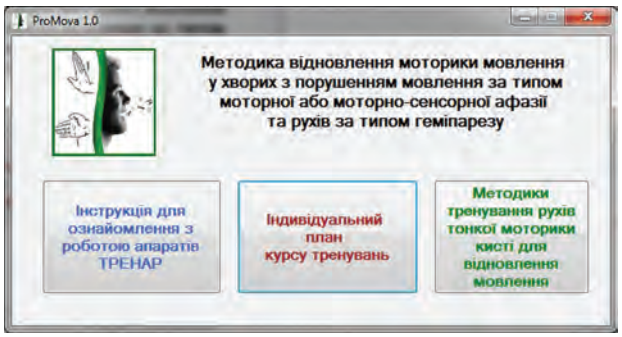
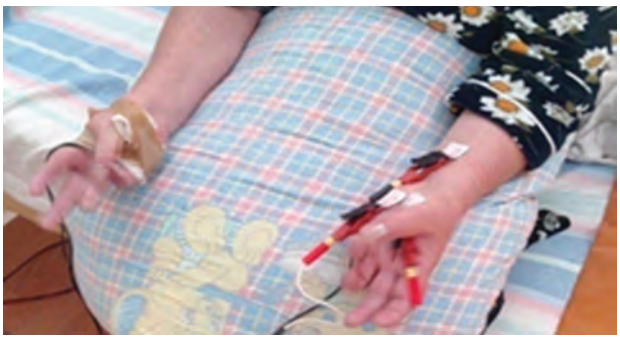
PROMOVA-1 SPECIALIZED SOFTWARE MODULE FOR INFORMATION AND CONSULTING SUPPORT OF PERSONALIZED CONTROL OF HAND MOVEMENTS WHILE RESTORING SPEECH



Home window



Individual restoration of oral motor after blood stroke: motor aphasia, right-sided hemiparesis

Areas of Application

The software is developed to determine personalized "route map" of rehabilitation course for affected hand and fingers movements training to restore speech of blood stroke patients taking into account their current neurological status and functional state of affected hand

Specification

The software module has a decision support subsystem and an electronic multimedia guide for fine motor hand movements control based on the TRENAR technology. The system requirements — processor: 1.5 GHz or higher; memory: 1 GB RAM or more; hard drive space: 150 MB; operating system: MS Windows XP, Vista, 7; additional software: Net.Framework, version 4.0 and higher

Advantages

A unique approach to speech restoration; enhanced effectiveness; individual approach to speech restoration, intensification of knowledge mastery

IPR Protection

IPR2, IPR3

Stage of Development. Suggestion for Commercialization

IRL7, TRL5
Supply, software setup, and staff training, upon request

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RADIONUCLIDE ^{82}Sr

Automated installation for ^{82}Sr radionuclide production

Areas of Application

The radionuclide is used for creating ^{82}Sr/^{82}Rb generator applied in cardiodiagnostics

Specification

The installation and technology are based on unique isochronous cyclotron U-240. The cyclotron generates protons with an energy of 70 MeV, which irradiate the target RbCl. The ^{82}Sr / ^{82}Rb generator can be used in positron emission tomography for one month without replacement

Advantages

There are no analogs in Ukraine.
Cheaper than the foreign analogs.
Enables not to install a cyclotron and a radiochemical laboratory at clinics, which significantly reduces the cost of cardio diagnostics

Stage of Development. Suggestion for Commercialization

IRL3, TRL3
Manufactured and supplied, upon request

IPR Protection

IPR1

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RAUWOLFIA SERPENTINA BENTH. TISSUE CULTURE AS SOURCE OF ANTIARRHYTHMIC ALKALOID AJMALINE

Areas of Application

The tissue culture is used to produce herbal remedies for the treatment of heart ventricular arrhythmias and for the prevention of cardiac arrhythmias in the case of excessive physical exertions (astronauts, pilots, submarine sailors, athletes, etc.)

Specification

The strain of *Rauwolfia serpentina* tissue culture is ajmaline monoproducer. *Rauwolfia serpentina* callus growth cycle is 45—50 days. The yield of dry biomass is 25—30 g per 1 liter of medium. Ajmaline content is 1.2—2.1% on dry biomass basis

General view of *Rauwolfia serpentina* Benth. tissue culture, the ajmaline monoproducer

Advantages

In Ukraine, there is no ajmaline production. Its synthetic substitutes have serious side effects. The strain of *Rauwolfia serpentina* tissue culture has no analogs in the world both as ajmaline monoproducer and in terms of its performance. The proposed ajmaline costs about 30% lower as compared with the world market price

Stage of Development. Suggestion for Commercialization

IRL4, TRL4
Technical ajmaline in limited quantities (100 g) provided upon request. Seeking partners for mass production of ajmaline

IPR Protection

IPR3

Contact Information

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SCREENER AUTOMATED SPECTROMETRY COMPLEX FOR HUMAN BODY INTERNAL RADIATION MEASUREMENT

Specification

Registered radionuclides: K-40, Cs-137, Cs-134, Ru-106, Ra-226, Th-232, and others.

Dimensions of NaI (Tl) scintillation detector, mm	∅120 × 80
Range of registered energies, MeV	0.05—3.0
Cs-137 MPA in human body, Bq	≤200
Range of measured radionuclide activity, kBq	0.20—555
Energy band enhancement for Cs-137, %	7.5
Time to the operating mode, min	10
Rapid monitoring rate, people/h	15
Continuous operation time, h	24
Operating temperature, °C	10—35
Permissible humidity, %	≤75
Power	220 V, 50 ± 2 Hz
Dimensions, mm	1400 × 800 × 1100
Weight, kg	100

Areas of Application

The device is designed to measure the content of radionuclides accumulated in the human body as a result of consumption of contaminated food or inhalation of contaminated air

Advantages

Rapid operation, enables keeping databases

IPR Protection

IPR1, IPR3

Stage of Development. Suggestion for Commercialization

IRL8, TRL9
Production sample. Sale of device. Manufacture, commissioning, supply, staff training, and warranty service. Creation of a technological framework for manufacturing generic model. Finalization of sample and serial production model. Further upgrade of production, optimization solutions for adjustment to the main markets

Contact Information

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SODIUM IODIDE (^{131}I) CAPSULES

Areas of Application

The sodium iodide (^{131}I) is a radiopharmaceutical used in nuclear medicine for diagnosing and treating thyroid cancer and its metastases

Specification

The one-stage thermographic technology has been developed for the extraction of ^{131}I from tellurium irradiated by neutrons from WWR-M research reactor of INR of the NAS of Ukraine. ^{131}I output from the target material exceeds 70%. The final product is carrier-free sodium iodide (^{131}I) solution dispersed on the surface of solid inert carrier contained in gelatin capsules. The physical and chemical properties of sodium iodide (^{131}I) meet the requirements of the European Pharmacopoeia.

Radioactive Concentration, MBq/ml	37—1100
Radionuclide purity, %	99.99
Radiochemical purity, %	>97
Chemical purity, ppm Te	<1
Acidity, pH	7—10

Plant for production of sodium iodide (^{131}I) capsules

Advantages

There are no counterparts in Ukraine; cheaper than the foreign analogs

Stage of Development. Suggestion for Commercialization

IRL4, TRL4
Manufactured and supplied, upon request

IPR Protection

IPR1

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SODIUM IODIDE (^{131}I) SOLUTION

Areas of Application

The sodium iodide (^{131}I) is a radiopharmaceutical used in nuclear medicine for diagnosing and treating thyroid cancer and its metastases

Stage of Development. Suggestion for Commercialization

IRL4, TRL4
Manufactured and supplied, upon request

Specification

The one-stage thermographic technology has been developed for the extraction of ^{131}I from tellurium irradiated by neutrons from WWR-M research reactor of INR of the NAS of Ukraine. ^{131}I output from the target material exceeds 70%. The final product is solution for oral administration. The physical and chemical properties of sodium iodide (^{131}I) meet the requirements of the European Pharmacopoeia

Advantages

There are no counterparts in Ukraine; cheaper than the foreign analogs

IPR Protection

IPR1

Contact Information

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SODIUM PERTECHNETATE-99mTc ELUATE

Areas of Application

The sodium pertechnetate-99mTc is radiopharmaceutical most widely used in nuclear medicine for the diagnosis of tumors in different locations and non-neoplastic pathologies of the body

Specification

The neutron-activation technology for obtaining sodium pertechnetate-99mTc has been developed using stationary centrifugal extraction generator located in hot cells of the WWR-M research reactor (Institute for Nuclear Research NAS of Ukraine). The physical and chemical properties of the sodium pertechnetate-99mTc meet the requirements of the European Pharmacopoeia

Hot cell of stationary generator for 99mTc extraction

99mTc-pertechnetate and transport portable container

Advantages

There are no counterparts in Ukraine.
Cheaper than foreign analogs

Stage of Development. Suggestion for Commercialization

IRL4, TRL4
Manufactured and supplied, upon request

IPR Protection

IPR3

Contact Information

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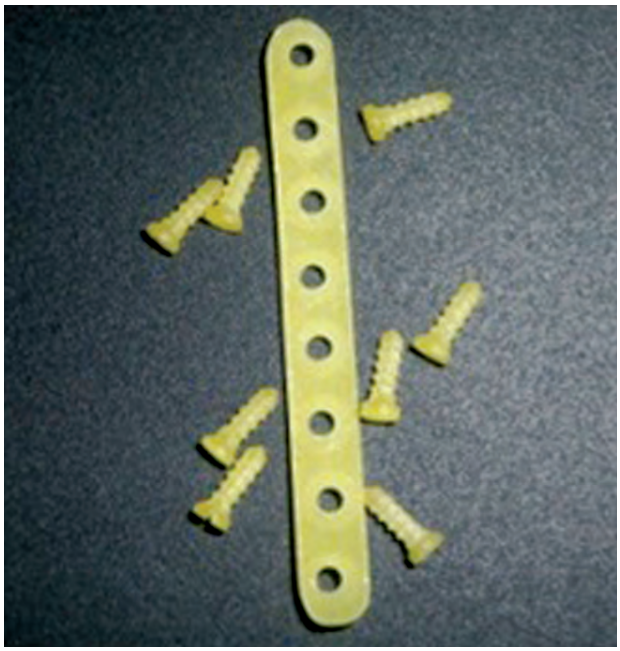
STRUCTURAL PARTS FOR OSTEOSYNTHESIS



Areas of Application

The structural parts are designed for quick connection of matched bone fragments and their strong fastening during reconstruction works in jaw-facial surgery, traumatology, and orthopedics surgery

Specification

The structural parts in the form of bone plates are made of nanostructured composite materials based on epoxypolyurethane that contains filler and medicinal drug. They have local therapeutic effect as result of sustained release of medicinal drug over an extended period of time and are biodegradable implants.

Tensile strength, MPa	28.0 ± 2.8
Elongation, %	5.0 ± 0.5

Advantages

As compared with similar foreign and domestic medical products, the structural parts have a lower cost and improved performance characteristics, enable to avoid a repeat surgery and to reduce the risk of complications in postoperative period, provide a prolonged drug action

Stage of Development. Suggestion for Commercialization

IRL3, TRL3
Manufacture and supply of customized products, upon request

IPR Protection

IPR3

Contact Information

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SUPERSENSITIVE MAGNETOCARDIOGRAPHIC SYSTEM FOR EARLY DETECTION, DIAGNOSIS, AND MONITORING OF HEART DISEASES

Areas of Application

The system is designed for early detection of ischemia, diagnosis of coronary artery disease, stratification of arrhythmia risk and prolonged QT syndrome, diagnosis of coronary arteries diseases, evaluation of the treatment effectiveness, and testing of drugs on proarrythmic effect

Specification

Reference MCG electrocardiograph for signals synchronization; clinical tests and certification; guidelines approved by the Ministry of Health of Ukraine.

The number of measuring channels	9
Capacity, patients per hour	4
Scanning area, cm	20 × 20
Scan accuracy, mm	4
The working days on one portion of liquid helium, days	5
Service life, years	10

Advantages

There are no competitors in Ukraine; the device is 2—3 times cheaper as compared with the foreign counterparts; enables to localize multiple electrical sources distributed in the heart volume; the noise suppression algorithms and signal processing provide accurate diagnosis without the use of special means for reducing the magnetic noises (for instance, expensive shielding)

IPR Protection

IPR3, IPR4

Stage of Development. Suggestion for Commercialization

IRL6, TRL6
Manufacture of small series, supply, warranty maintenance, and staff training, upon request

Contact Information

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TECHNOLOGY FOR LOW-TEMPERATURE LONG-TERM STORAGE OF HUMAN DONOR BLOOD ERYTHROCYTES

Low-temperature bank of human blood cells

Areas of Application

The technology provides a long-term (for decades) storage of blood cells to be used in clinical practice

Specification

The technology enables storing human donor blood cell (erythrocytes) at a low temperature (–150÷–196 °C) with Propanediosacharol as preservation agent in disposable polymer cryocontainers

Stage of Development. Suggestion for Commercialization

IRL5, TRL5
Preparation and transfer of technology regulations, production and delivery of special equipment to implement freeze-thawing stages, and staff training, upon request

Advantages

As compared with the known methods, this technology has significant advantages, in particular, it facilitates the technological stages of cell preparation for cryopreservation and clinical application, it is notable for a high level and stability of frozen cell preservation and their clinical effectiveness, is much cheaper and accessible for practical use

IPR Protection

IPR1, IPR3

Contact Information

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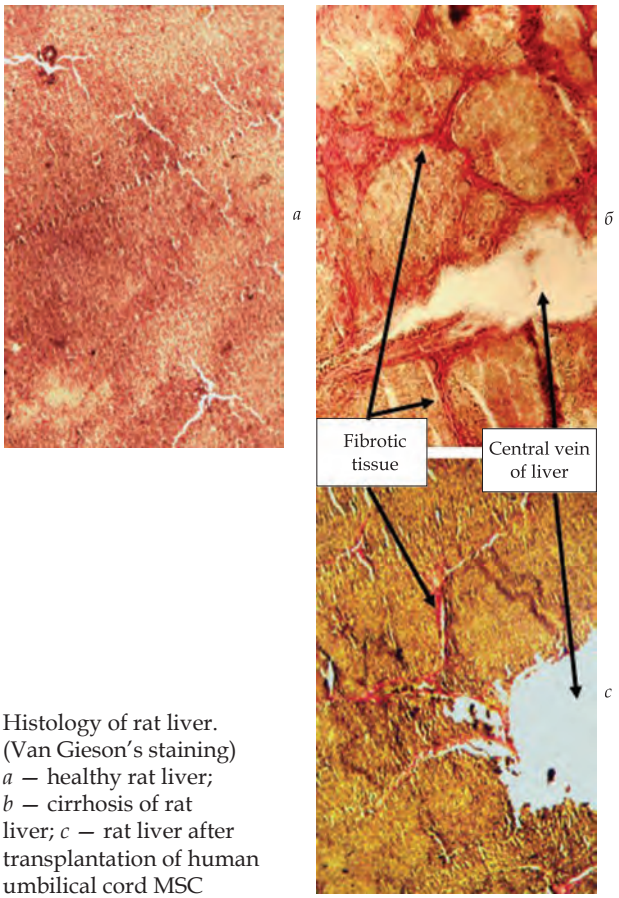
TECHNOLOGY FOR REPAIRING THE INJURED LIVER BY TRANSPLANTATION OF HUMAN UMBILICAL CORD MSCs

Areas of Application

The laboratory protocol for repairing the liver structure and function by transplantation of human umbilical cord mesenchymal (stromal) stem cells can be a basis for cell therapy of liver diseases in clinical trials



Histology of rat liver. (Van Gieson's staining) *a* — healthy rat liver; *b* — cirrhosis of rat liver; *c* — rat liver after transplantation of human umbilical cord MSC

Specification

The transplantation parameters include the characteristics of cell preparation (that contains human umbilical cord MSCs isolated from human umbilical cord by the explant method and multiplied by cultivation in 1—2 passages in vitro with surface markers (CD 73, CD105, CD90) expression exceeding 95%) and the transplantation method (systematic introduction of cells at a dosage of $(5—7) \cdot 10^6$ cells/kg

Stage of Development. Suggestion for Commercialization

IRL3, TRL2

IPR Protection

IPR2

Advantages

The cell therapy of liver cirrhosis using MSC is an alternative to liver transplantation that is currently an exclusive, but a very expensive, invasive, and not readily available treatment of liver cirrhosis. The procedure for obtaining the MSC cell preparation is relatively cheap, does not require donor selection, and can be affordable for everybody

Contact Information

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TEOBON-DITHIOMYCOCIDE (TD) ANTIMYCOTIC AGENT

Areas of Application

The medicinal product for treatment and prevention of skin fungal infections

Specification

The TD has an effective fungicide action against *Candida albicans, Candida tropicalis, Trychophyton rubrum, Microsporum* canis and a significant bactericide action against gram-positive and gram-negative microorganisms, is low-toxic, doesn't cause any carcinogen, allergic, mutagen, and teratogen effects; doesn't accumulate in the organism. The product has been registered by the Ministry of Health of Ukraine

Stage of Development. Suggestion for Commercialization

IRL8, TRL9
The antimycotic agent and manufacturing technology are proposed

Advantages

TD outperforms the known reference drugs by efficacy, tolerability, and absence of negative effects on the human organism. The average treatment time decreases by 29%, the efficacy and the tolerability improve from 2.15 to 1.32 and from 1.87 to 1.09, respectively (1 is the highest score). The TD manufacture is periodic, non-waste, and ecologically safe

IPR Protection

IPR1, IPR3

Contact Information

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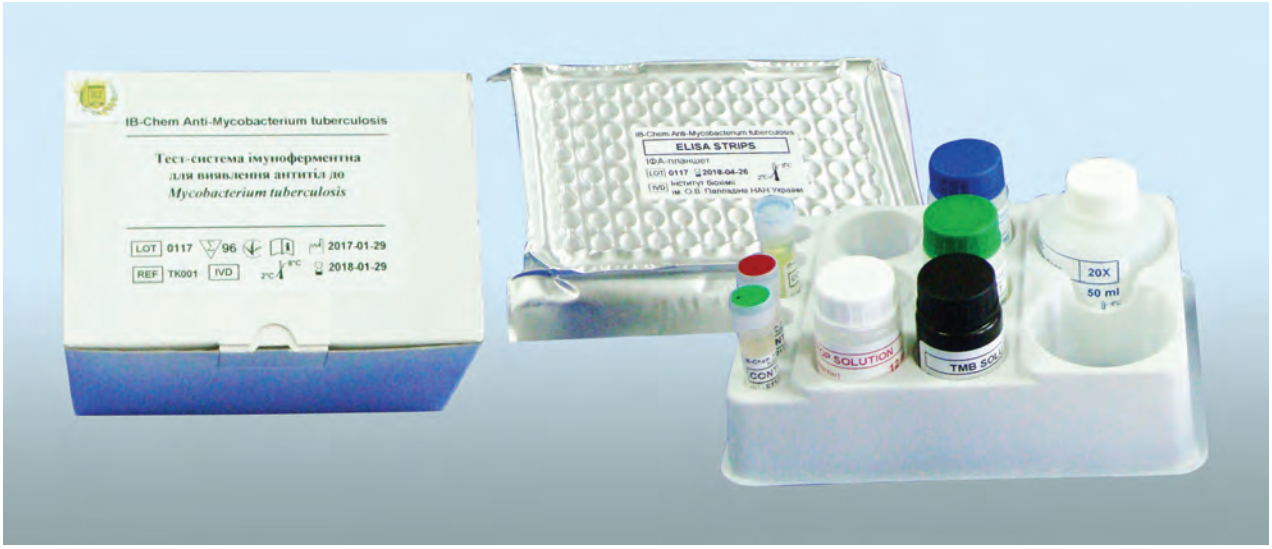
TEST SYSTEM FOR DETECTING THE ANTIBODIES AGAINST *Mycobacterium bovis*



Areas of Application

The test system is designed for diagnosing tuberculosis infection in animals at the level of herds, individual animals with latent tuberculosis or with tuberculin allergy, which are latent source of tuberculosis

Specification

The test system includes immunosorbent based on genetically fused recombinant antigen MPB63-MPB83 *M. bovis* of our own production, which is highly immunogenic and highly specific for the antibodies against *M. bovis*

Advantages

This test system is unique. In comparison with the existing systems it is more precise, easy-to-use, reliable, and affordable for livestock farms in Ukraine

Stage of Development. Suggestion for Commercialization

IRL8, TRL8
Seeking partners for mass production

IPR Protection

IPR3

Contact Information

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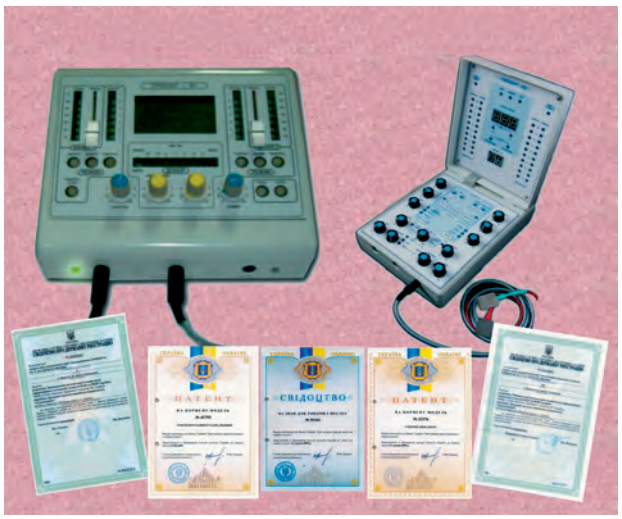
TRENAR® PORTABLE ELECTRONIC DEVICES COMPLEX FOR MOTOR FUNCTION AND SPEECH RESTORATION



Areas of Application

TRENAR® bioinformational technology is designed to restore motor function after severe diseases of central and peripheral nervous system (stroke, facial nerve neuritis, cerebral palsy, etc.), trauma, postoperative complications and speech after stroke

Specification

The technology uses 2 portable electronic devices. *TRENAR*-01: 2 channels for electrical stimulation, rectangular radio impulses 10—180 Hz, basic frequency 5 kHz, maximum current 50 mA, 1 channel for EMG-signal record 30—300 μV; *TRENAR*-02: 2 channels for electrical stimulation, rectangular impulses 40—200 Hz, maximum current 50 mA, 2 channels for EMG-signal record 10—300 μV

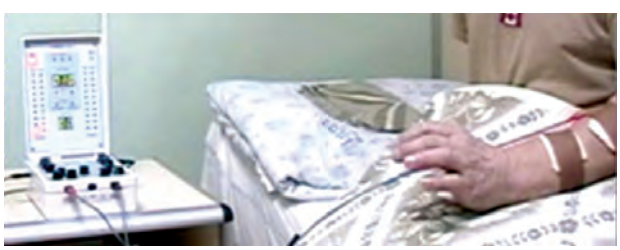
Advantages

Unlike the existing technologies, *TRENAR*® uses a set of techniques (programmed, threshold electrical stimulation, biofeedback), programs (artificially synthesized, based on work of healthy muscles), which enables to activate additional reserves for motor function and speech restoration, to involve the patient in treatment process, to organize individual treatment plan, and to raise the effectiveness of rehabilitation. The technology functional range exceeds the known domestic and foreign analogs

Motor function training after stroke using Donor program (based on healthy muscles)

Stage of Development. Suggestion for Commercialization

IRL7, TRL8
Supply, guarantee service, and staff training, upon request



Motor function training after stroke using Threshold stimulation program

IPR Protection

IPR3

Contact Information

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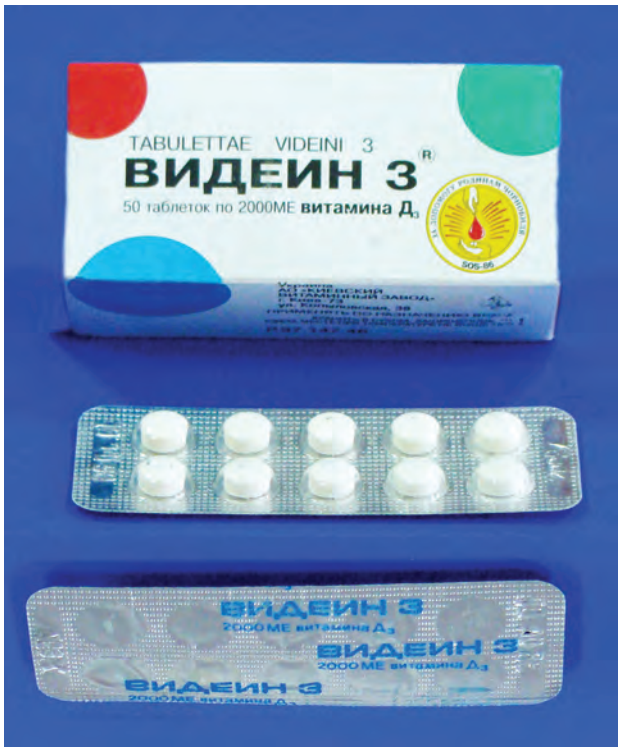
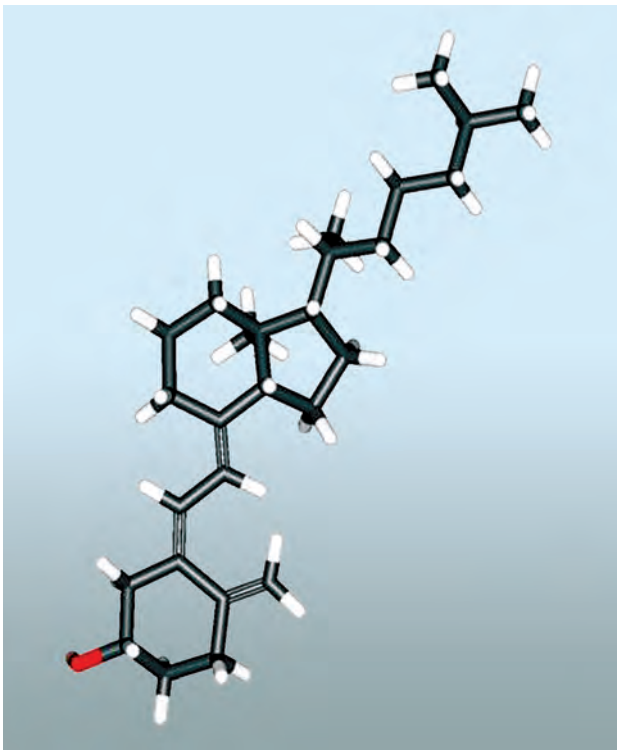
VIDEIN 3 HEALTH VITAMIN D_3-**E** PROTEIN COMPLEX





Areas of Application

Vitamin D_3-E protein complex is designed for prevention and therapy of rickets and rickets-like diseases in children, D-hypovitaminosis in pregnant women, osteopathy of different genesis, disorders of bone mineralization (osteomalacia, osteoporosis), treatment of patients after joint replacement surgeries, orthopedic deformities with delayed consolidation after limb fractures, for complex therapy of rheumatoid arthritis, etc.

Specification

Health Videin 3 vitamin D_3-E protein complex contains vitamin D_3 in complex with casein protein and vitamin E in the physiological concentration. Synergism of the complex components increases the D_3 content in the organism by 30% and thereby enhances its preventive and therapeutic effect

Advantages

There are no analogs in the world.
The complex has a high bacterial purity as compared with the existing drugs, made of natural components only, does not contain any preservatives and synthetic stabilizers; has a long storage life (5 years); is notable for high bioavailability, therapeutic efficiency, and quality

Stage of Development. Suggestion for Commercialization

IRL7, TRL7
Small batches manufactured upon request.
Seeking partners for mass production

IPR Protection

IPR3

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INNOVATION READINESS LEVEL (IRL) SCALE

IRL	Innovation Readiness Level	Definition
IRL1	Inventor or team with a dream	The lowest level of readiness where the intention transforms into an idea of space system application or the space technology transforms into a business venture
IRL2	Paper studies produced	Once the basic ideas have been formulated, they are put down on paper in studies and analyses of business opportunities
IRL3	Experimental evidence of business opportunity	Active research and development are initiated, including analytical / laboratory studies to validate predictions regarding the market, the competition, and the technology
IRL4	Capability to implement limited-scope programs with project teams	Basic technological and business components have been developed to establish that they will work together; an initial business plan is available
IRL5	Capability to support project engineering development and design (no product, no revenues)	The basic technological and business components have been integrated with reasonably realistic supporting elements. The business plan is credible, but still needs to be validated against the final product characteristics
IRL6	Capability to support development and design with a market-driven business team (product, no revenues)	The representative prototype system has been tested in a relevant environment. The business team is still incomplete and the venture is not yet ready for commercialization. A full business plan including the market, the operational, the technological, and the financial aspects is available
IRL7	Capability to support limited production; full business team in place (product and limited revenues)	The business can run on a limited scale. The full team is in place
IRL8	Capability to advance to full production and distribution (product and revenues)	The technology has been proven to work and the venture structure has proven to be able to support growing market shares
IRL9	Fully articulated business with appropriate infrastructure and staffing (growing market share)	The offering incorporating the new technology has been used in operational conditions and the business is running with a growing market share

Intellectual Property Rights Protection[1] Levels

IPR codes	Protection Level
IPR1	Technical solutions are know-how[2]
IPR2	Applications for copyright protection of IPR objects are expected to be or have been submitted
IPR3	The copyright protection of IPR objects as established by the applicable law of Ukraine has been obtained and is kept in force
IPR4	International industrial patent application(s) (according to the PCT system, etc.) has (have) been submitted. Application(s) for industrial patents has (have) been submitted in foreign country(ies) under national procedure
IPR5	The industrial patent(s) in foreign country(ies) has (have) been obtained and is/are kept in force

[1] The IPR protection measures are implemented by R&D institutions in accordance with the applicable legislation of Ukraine and the requirements of paragraphs 5, 8, and 9 of the Regulations for the use of intellectual property objects at the NAS of Ukraine as approved by Resolution of the Presidium of the NAS of Ukraine No.15 of January 16, 2008, on the Structural Units Responsible for Technology Transfer, Innovation Activities, and Intellectual Property (as revised)

[2] Know-how is technical, organizational, or commercial data obtained with the use of experience and upon trials of technology and its components, which are: closely held (not a part of general knowledge or available for public) on the date of license agreement; essential, i.e. important and useful for manufacture of products, manufacturing process, and/or provision of services; and elaborate i.e. detailed and complicated enough to verify their compliance with the criteria of being never-before-known and essential (Clause 1 of the Law of Ukraine on the State Regulation of Technology Transfer Activities)

TECHNOLOGY READINESS LEVEL (TRL) SCALE

Stage	TRL	Interpretation	Definition and Description
Invention	TRL1	Basic principles observed	Basic scholarly research is translated into potential new basic principles that can be used in new technologies
	TRL2	Technology concept formulated	Potential areas of application of basic (technological) principles, including the technological concept are identified. Basic manufacturing principles are elaborated and potential sales markets are identified. A small research team is established to assess the project feasibility
Concept validation	TRL3	First assessment of concept and technology effectiveness	Based on preliminary study, actual research is conducted to assess technical and market feasibility of the concept. This includes active R&D works at the lab and first negotiations with potential customers. The research team expands. Market feasibility is assessed
	TRL4	Prototype validation at lab	Basic technological components are integrated to assess early feasibility by testing in laboratory environment. Manufacture options are studied with basic manufacturing principles identified. Key markets are researched to study demand. The organization is ready to scale up, possible services are analyzed. Comprehensive marketing analysis is made
Prototyping and incubation	TRL5	Prototype testing in user environment	The system is tested in user environment with broader technological infrastructure involved. The actual use is tested and validated. Production-support works and pre-production tests are done in lab environment. Trial batches of prototypes enter the key markets. The organization starts activities to further distribute the prototypes and to enter the sales markets
Pilot production and demonstration	TRL6	Pre-production, including tests in user environment	The product and manufacturing technologies are completely ready for launch of a pilot line/pilot plant (low-scale manufacture). The product and manufacturing technologies are assessed and finalized. This may include additional R&D works. The early products and manufacturing technologies are tested in the key markets with simultaneous organization of manufacture (marketing research, logistics, production facilities, etc.)
	TRL7	Low-scale pilot production demonstrated	The product manufacture is fully operational at low rate. Actual commercial products are manufactured. The final products are verified in the key markets. The organizational component is completed (comprehensive marketing strategy, all components of manufacturing activities). The products are formally launched in test markets
Initial market introduction	TRL8	Manufacture fully tested, validated, and certified	The manufacturing flow charts, product final version, production organization, and marketing tools are completed. The full-scale manufacture has been launched. The final product is sold in majority of domestic and international markets
Market expansion	TRL9	Manufacture and products fully operational and competitive	The full-scale manufacture is sustainable, with the product gaining new markets. Minor modifications and improvements create new versions. The technology and product output are optimized through implementing innovative concepts on manufacturing process. The product is fully customized to the key markets

Reference book

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THE NAS OF UKRAINE

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