

Saint-Petersburg Pavlov State Medical University (SPPSMU) Federal Agency of Public Health and Social Development



NOVEL STENTLESS AORTIC
VALVE BIOPROSTHESES

Page 12

CONTACT: PROF. NIKOLAI YAITSKIJ, RECTOR OF THE UNIVERSITY;
TEL: +7 (812) 499-71-53; FAX: +7 (812) 234-95-69;
EMAIL: REGISTER@SPMU.RSSI.RU; WEBSITE: SPMU.RUNNET.RU

The University is one of the largest medical institutions in Russia renowned for education, science and medical care. It is also one of Russia's premier research and innovation centers in the biomedical sciences.

SPPSMU specializes in Research & Development activities in the following areas:

- > Heart, lung, and kidney pathologies;
- > Pharmacotherapy;
- > Cell and molecular biology and pathology;
- > Cell and organ transplantation;
- > Experimental modeling and clinical application of laser-assisted technologies; and
- > Contagious diseases and secondary immunodeficient conditions: diagnostics and immune correction.



The laboratories have state-of-the-art instrumentation, and are supported by a well-equipped vivarium for conducting animal studies on mice, rats, guinea pigs, rabbits and dogs.

HIGHLIGHTS OF RESEARCH

- > Identification of PARK2 gene mutations in Parkinson's disease; a novel P2Y12 receptor's alleles, and CYP2C9*2 and CYP2C9*3 alleles associated with thrombosis
- > Novel approach to kidney disease treatment based on the alleviation of hyperhomocysteinemia
- > Identification of the signaling pathways responsible for myocardial protection from ischemia-reperfusion injury, primarily, in pre- and post-conditioning, and experimental modeling
- > Experimentally backed improvement of the jejunal-ileal shunt surgery, with essential alleviation of the metabolic syndrome

The University brings together 59 departments, five research institutes and ten centers housing 66 laboratories, governed by 4 councils and 9 scientific boards. The University employs 767 faculty and 255 full time researches. The illustrious research staff is comprised of 12 members of the Federal Russian Academy for Medical Science, 242 Doctors of Sciences, 562 Ph.D.s, 26 engineers, 506 technicians and 371 Ph.D. students.

- > Relapse-prevention and HIV prevention treatments in heroin addicts
- > Novel approach in clinical diagnostics based on genotyping and expression of polymorphic human genes (chemokines, chemokine receptors, interleukins, MMPs, TIMPs, etc., Total > 30 markers) related to inflammation in: (i), immune disturbances in chronic respiratory and heart disorders (5 distinct pathologies); (ii)

hyperplasias of the reproductive system (5 distinct pathologies); (iii) dental disease (tooth decay/loss, paradontitis), with DNA diagnostics of associated bacterial pathogens.

TECHNOLOGY SPOTLIGHTS:

- > Model of chromatomembranous mass exchange block with improved (compared to the available prototypes) biocompatibility with blood and gas transport characteristics;

The laboratories have state-of-the-art instrumentation, and are supported by a well-equipped vivarium for conducting animal studies on mice, rats, guinea pigs, rabbits and dogs.

- > Advanced version of laser correlation spectrometer for evaluation of hydrodynamic diameters of particles in the size range of 1 – 104 nm in biological liquids.

The University has established an extensive network of international partners — a total of 24 institutions in 11 countries, including The Howard Hughes Medical Institute (USA); Humboldt University (Germany); Karolinska Institute (Sweden); Nippon Medical School (Japan); Mater Domini Clinic (Italy); The University of Groningen (The Netherlands); NIDA/NIH; NIAAA/NIH; NIAID/NIH; University of Pennsylvania and Yale University. The University welcomes collaborations from Western Industry partners.

NOVEL STENTLESS AORTIC VALVE BIOPROSTHESES

CONTACT: DR. VLADIMIR I. GAVRILENKOV, PAVLOV STATE MEDICAL UNIVERSITY, ST. PETERSBURG; TEL: +7 (812) 2346170; EMAIL: MASLEVTCOV@YANDEX.RU

There is a growing trend in clinical practice worldwide towards broader and increased application of biological substitutes for heart valves. This trend is caused, on the one hand, by dissatisfaction with the long-term results of existing mechanical prostheses, in particular, the number of complications and the overall quality of patient life, and, on the other hand, development of new models of bioprostheses through improved production technologies.

The stentless xenoaortic prosthesis, developed by the Pavlov State Medical University, is specifically designed for superior hydrodynamic and biomechanical performance as compared to currently available analogs, and to more closely mimic the functional parameters of natural aortic valves. Moreover, the implantation technique for this bioprosthesis has been greatly simplified when compared to analogs. Experimental testing of this device has been successfully completed, and the next step is to conduct clinical trials of the aortic valve bioprosthesis.

The design and manufacturing process for the stentless xenoaortic prosthesis are protected by patents of the Russian Federation 2175858 (priority date 28.12.2000) and 2234217 (priority date 31.12.2003).

The Pavlov Medical Academy seeks strategic partnerships for licensing and co-development of the novel stentless xenoaortic prosthesis with Western manufacturers of heart bioprostheses.