"St. Petersburg Scientific Research Institute of Epidemiology and Microbiology. Pasteur"

FBUN Institute of Epidemiology and Microbiology named after Pasteur

The objectives of the Institute today

- Research on a number of issues of etiology, **epidemiology** and **microbiology** of actual infections.
- Research in the field of **vaccinology**.
    - **Rubella vaccine** based on the reduced vaccine strain "Eagles"
- Biotechnology embodied in numerous formulations for a particular **diagnosis** of infectious diseases.
- Working on clinical trials of new prevention and treatment of infectious diseases.
- The Institute joint projects with scientists from France, Finland, the UK, Sweden, USA and other countries.

The Institute was founded on April 4, 1923 first name of "Bacteriological and Diagnostic Institute." To commemorate the 100th anniversary of the birth of Louis Pasteur - In 1993, the Institute accepted as a full member of the international association of the Pasteur Institute in the world

Director of the Institute - Zhebrun Anatoly Borisovich

- The institute laboratories are 9, 2 and 5 Department of district and regional centers
    - Lab:
        - Laboratory of Epidemiology
        - Laboratory zooantroponoznyh infections
        - Laboratory of Viral Hepatitis
        - Laboratory of intestinal infections
        - Laboratory of bacterial respiratory infections
        - Laboratory etiology and control of viral infections
        - Laboratory of Immunology
        - Laboratory of Molecular Microbiology
        - Laboratory childhood viral infections
    - Departments:
        - Department of New Technologies
        - Department of Scientific Medical Information
    - Center of the Institute:
        - North-Western Regional Centre for Rickettsioses
        - North-Western Regional Centre for Salmonellosis
        - Regional Centre for Surveillance and polio acute flaccid paralysis
        - North-Western Regional Centre for Surveillance of viral hepatitis
        - Northwestern District Center for the Prevention and Control of AIDS

Laboratory of Epidemiology - Lalin Lyudmila Head of the Laboratory

Research on the following issues:

- Improving the system of **surveillance for polio** and other diseases with the **syndrome of acute flaccid paralysis** and **enterovirus** infections post sertifikatsionny period
- Optimization of surveillance for **measles** elimination of infection at the stage
- Assessment of the epidemiological and immunological effectiveness of **vaccination of mumps** in the North-West Federal District of the Russian Federation
- Improvement of the supervision of congenital and postnatal **rubella**
- Estimate the burden of **rotavirus** in the North-West Federal District
- Development of an integrated surveillance system and prevention of human **papillomavirus** infections.

Lab has two regional centers:

- St. Petersburg Regional Center of epidemiological surveillance of **poliomyelitis** and acute flaccid paralysis
- St. Petersburg Regional Center of epidemiological surveillance **measles**

Successfully developing international cooperation with institutions in Norway, Finland, Sweden, Canada, and colleagues from the Centers for Disease Control (CDC) of the USA.

Laboratory zooantroponoznyh infections - Tokarevich NK Head of the Laboratory

Scientific activities NA Stoyanova study of natural focal infections, such as **leptospirosis**.

- She published more than 120 scientific papers and is the author of several guidelines, 3 patents and 10 strains of Leptospira protectable, including vaccine deposited in the WHO Reference Laboratory at leptospirosis NIIEM them. St. Petersburg."

Information about the laboratory

- For many years one of the main topics of research conducted in the laboratory have been **rickettsioses** - first **typhus**,
    - Including: reduced form (**Brill's disease**), rat typhus, tick-borne typhus koksiellez and Asia,
- Now: monocytes ehrlichiosis and human granulocytic Human anaplasmosis.

The first in the country began to study at the "new" for the time - **Q fever**.

Study of epidemiology, laboratory diagnosis and prevention:

- psittacosis, tularemia, yersiniosis, hemorrhagic fever with pochechnym syndrome, encephalitis and other arbovirus infections

Together with doctors sanepidsluzhby analyzed long-term data on the incidence of "tick" infections.

1- **Common line**: evolution of the profile of scientific research and applications characterized by the expansion of the list of clinical entities with a focus on infection, common to animals and humans (zooantroponozy).

- Diagnosed "new" for Russia infection: monocytic ehrlichiosis and human granulocytic anaplasmosis person.

2- **Second line**: improvement and development of display vozbuditeley zooantroponoznyh infections and detect antibodies to them

- Research to improve molecular genetic methods to detect C. burnetii and Leptospira, for the study of genetic heterogeneity of these pathogens.
- Essential to improve the efficiency of laboratory diagnostic and epidemiological surveillance zooantroponoznymi infections.

3- **Third line**: study of pathogens zooantroponozov relationship with the owners and carriers.

4- **Fourth line**: development of **drugs** for the prevention and treatment of specific infections zooantroponoznyh

- Multidisciplinary research for the development and testing of inactivated combined **vaccine against Q fever**.

The branch of the All-Union Center for Rickettsioses. Head - NK Tokarevich.

- To provide guidance and practical assistance to health care institutions and health service organization in the field of anti-epidemic and preventive measures for **rickettsia** diseases, the study of the incidence of rickettsial diseases, systematic laboratory diagnostics, development and testing of new diagnostic and preventive medications.

Main activities Center:

1) **Identification** and **characterization** of Rickettsia strains isolated in various parts of the world;

2) Maintenance of reference strains and issue them for reference purposes only individual laboratories;

3) Training of specialists;

4) Advice, assistance and participation, as appropriate, in the study of natural foci of rickettsial diseases.

Laboratory of Viral Hepatitis - Millers Sergey Leonidovich - Head of the Laboratory

Work towards the development of prevention and diagnosis and improving epidemiological surveillance of **viral hepatitis**.

- The first diagnostic drug was developed in collaboration with specialists from the Institute of Biophysics Laboratory NIIEM and Nizhny Novgorod in 1989. detection of HbsAg
- Since 1992 actively involved in the development of drugs for the diagnosis of **hepatitis C virus** (HS).
- In 1994, the country's first immunoassay test system for the detection of antibodies to **hepatitis C virus**.
- From 1987 to 1995 research in the laboratory to obtain highly purified HBsAg expressed by recombinant vaccinia virus strains,

Study of the **epidemiological patterns of viral hepatitis**, it is constantly evolving and laboratory of the Centre for Surveillance of viral hepatitis.

Since 1998 research on molecular epidemiology of viral hepatitis in the framework of joint projects with the **Swedish Institute** for Communicable Disease Control, the National Institutes of Health **Finland** and specialized research institutions of **Lithuania and Estonia**.

Study of the pathogenesis of viral hepatitis has been associated with the search for epitopes in the surface proteins of the virus, which is carried out using techniques of synthetic peptides within a cooperative research program on the Inco-Copernicus, together with specialists from the Institute Pasteur (France), the Pasteur Institute (Greece) Cantacuzino Institute (Romania) and Polish scientists.

Laboratory currently operates in 3 directions:

- Improving surveillance of viral hepatitis in the country;
- Molecular epidemiology of hepatitis A, B and C;
- Clinical-laboratory comparisons for acute and chronic viral hepatitis

Laboratory of intestinal infections - Kaftyreva Lidiya - Head of the Laboratory

- Studying the various issues of microbiology, epidemiology, clinical and prevention of acute intestinal infections.
- Development issues etiologic of various **enteropathogens**, biology and pathogenicity factors of pathogens, the most important links of pathogenesis of acute intestinal infections, laboratory diagnosis and prevention of intestinal infections is a priority research activity.

Since 2004, the Institute is a training center of WHO's global surveillance program for **salmonellosis**.

In 2008, the International Laboratory awarded a certificate of WHO, testifying to the successful resolution of 140 tasks of identification and determination of Salmonella antimicrobial susceptibility.

Since 2008, the laboratory is involved in the organization of external quality control of laboratory diagnostics.

The main activities of the laboratory:

- Study of features of the biological properties of circulating in human's pathogens intestinal infections.
- Detection of pathogenic factors as causative agents of intestinal infections.
- The development of new technologies laboratory diagnosis of DCI.
- Carrying out surveillance of enteric infections generated by specific biotypes (biovars) pathogens.
- Control of the circulation of resistant variants of pathogens and intestinal nosocomial infections.
- The study of the basic mechanisms of the development of resistance to antibiotics.
- Improving laboratory diagnosis of acute and chronic intestinal infections of viral, bacterial and protozoal.
- Genotyping of enteric pathogens and use of these data in the epidemiological analysis of sporadic incidence and flare.

Laboratory of bacterial respiratory infections - Tseneva Galina Y. - Head of the Laboratory

In this laboratory early work on the study of **pathogenic *Yersinia pseudotuberculosis*** properties, intestinal yersiniosis, klebsielleza, modeling of infectious processes, design and development of new diagnostic tools.

Since 1993 to study the biological properties of **diphtheria**, immunity to infection, epidemiological features of its propagation and development of new methods for monitoring diphtheria.

In recent years, the development of nanotechnology performed to determine toxigenicity diphtheria and antibodies there to.

new molecular genetic characteristics of **Bordetella, Corynebacterium, Yersinia**, improved methods of indication and identification; improved methods of control of immunity to diphtheria and pertussis, proved the decisive role in the post-vaccination immunity of high avidity antibodies.

Main research

- **Microbiology and epidemiological** : study of the properties of pathogenic bacteria, methods, tests and evaluation criteria virulence of bacteria, epidemiological aspects of virulence
- **Immunological**: the study of the antigenic composition and antigens and antibodies for diagnostic and prophylactic purposes.
- **Microbiology and technological** : development of advanced diagnostic products and culture media for rapid and an express diagnosis, and monitoring of pathogens
- **Clinical and microbiological**: evaluation of diagnostic efficacy, the development of the tactics of their application, methods of differentiation difficult to diagnose TB.

Laboratory etiology and control of viral infections - Bichurina A. Maina - Head of the Laboratory

From 1956 to 1989 the laboratory successfully led by Professor EA Friedman made a great contribution to the development of **domestic influenza vaccine**.

The main areas of research are:

- The study of the etiology of the **flu** and improvement of means of specific prophylaxis of this infection.
- The study of influenza drugs in laboratory models.
- Clinical trials of new and existing antiviral chemotherapy and biologics.
- Improving the inactivated influenza vaccine chromatographic technology of its manufacture, preparation, standardization, optimization of its control, safety and antigenic study activity.
- Research on the problem of **polio**.
- Research on the problem of **measles and rubella**.

The laboratory operates two centers of sub-national laboratory surveillance for measles and polio, belonging to a network of polio and measles WHO laboratories.

Laboratory of Immunology - Zhebrun Anatoly Borisovich - Head of the Laboratory

Main research fields:

- **Immunology**: study of the features of the immune response in diseases of the gastrointestinal tract associated with **H.pylori**;
- **Microbiology**: study of the biological properties of H.pylori and their correlation with clinical manifestations of H.pylori Susceptibility to antimicrobial agents
- **Molecular biology**: the study of genetic polymorphism of H.pylori, development of methods for the diagnosis of infectious diseases.
- **Epidemiology**: the study of the clinical and epidemiological features of some sexually transmitted diseases and H. pylori

- The development of an integrated diagnostic algorithm of chronic diseases of reproductive sphere, using modern diagnostic techniques
- Development of new techniques for the preparation of specific immunoglobulins for indicating bacteria of the genus **C.trachomatis** by immunofluorescence.

Laboratory of Molecular Microbiology - Narva Olga - Head of the Laboratory

To develop and implement new molecular genetic methods in diagnostics of infectious diseases.

- First given molecular genetic **characteristics diphtheria** and developed a comprehensive monitoring system in Russia circulating strains of C. diphteriae using ribotyping.
- Developed a new genotyping scheme that allows to differentiate strains of the pathogen within diphtheria infection.
- First studied the population structure of ***Mycobacterium tuberculosis***, proved its clinical and epidemiological importance.
- Laboratory developed molecular genetic techniques (determination of mutations associated **with drug resistance to TB drugs**.
- Genotyping strains of the pathogen isolated in outbreaks of tuberculosis, in order to identify sources and pathways of drug-resistant strains.
- Established gene **diagnostics and genotyping of hepatitis B virus and C**.

The staff have been trained:

the Paris Pasteur Institute (Institute Pasteur, Paris, France), Centre for Infectious Disease Control (CDC, Atlanta, USA), the Swedish Institute for Control Infectious Diseases (SMI, Stockholm, Sweden), the Institute of Public Health (KTL, Turku, Finland), the Pasteur Institute of Guadeloupe (Institut Pasteur de Guadeloupe, Guadeloupe, France).

In 2004, at the Institute of Microbiology, Bulgarian Academy of Sciences with the support of the Paris Pasteur Institute laboratory staff organized and conducted international training course on genotyping and identification of mutations of resistance to anti-TB drugs.

Main research fields of the laboratory:

- Search molecular genetic markers, develop methods genoidentifikatsii, genotyping pathogens and systems dynamic tracking populations of pathogens for improve the diagnosis of topical bacterial and viral infections and epidemiological supervision.

Laboratory childhood viral infections - Lavrenteva Irina - Head of the Laboratory

The goal was to create a high-performance laboratory **prophylactic drugs** against **measles**, **mumps**, **rubella** and **varicella**.

- Before were tasked with developing live attenuated vaccines concurrently developed theoretical issues associated with obtaining vaccine strains study mechanisms of attenuation and post-vaccination immunity.
- Traditional laboratory studies on the establishment and improvement of vaccines by work on the study of antiviral immunity, construction of diagnostic products, drugs and interferon inducers.

- improve technology for vaccine against rubella; produced new version of vaccine virus, adapted to sophisticated tissue substrate

Collaboration with «Center for Hygiene and Epidemiology in the Perm region," influence **rubella vaccine** prevention of adaptation variability of the pathogen infection.

The result of the last fifteen years of work in the laboratory

- depositing CGPM four original epidemic and vaccine (attenuated) strains of rubella virus and parainfluenza
- 5 patents for the invention of the Russian Federation,
- development of technical standards for live kulturalnyyu rubella vaccine
- creation and deposition of a diploid human cell line
- deposit 13 sequences rubella virus isolates in (NIH, USA).
- Part in the regional center for measles surveillance deployed by the Institute to them. Pasteur.

For the successful execution of planned research team Laboratory childhood viral infections was marked by **diploma** of the State Committee for Sanitary and Epidemiological Surveillance of the Russian (1995) and a **diploma** of NIIEM them. Pasteur (1998)

Laboratory biologics products - Verbov Vyacheslav- Head of the Laboratory

Established in 1992 for the industrial production of enzyme immunoassay systems.

- After 3 years, adjusted **5 enzyme immunoassay systems**: For detection of antibodies to causative agents of **tuberculosis**, **candidiasis**, **aspergillosis**, **hepatitis C** and for the detection of HBs-antigen hepatitis B virus
- Release of **industrial diagnostic test systems** were conducted systematic research to improve its products and develop new test systems.
- currently produces enzyme immunoassay systems to detect markers of infectious diseases:
    - **hepatitis A virus** antigen
    - antibodies to the **tuberculosis** pathogen
    - human **rotavirus** antigen
    - IgM antibodies to the causative agent of **leptospirosis**; **rickettsial** antigen Ku; antibodies to the pathogen Ku rickettsiosis.

Conducted research work at the development and production of diagnostic products in six areas:

- **Kits** for painting of microorganisms and biochemical identification.
- Sets of media and reagents for rapid biochemical identification of microorganisms.
- Selective media and test systems for rapid identification of microorganisms microvolume
- Disc set with antimicrobial, anti-fungal drugs and indicator.
- Immunofluorescence test systems for the diagnosis of viral respiratory diseases, herpes, rubella and chlamydia.
- Diagnostic erythrocyte measles for PHA.

In a number of developed products:

- Reagent kit for the **diagnosis of respiratory viral diseases** by immunofluorescence analysis (HP-EEO).

- Reagent kit for the **visual detection** of *Ureaplasma urealyticum* (Ureaplasma-50).
- Reagent kit for the visual detection of *Mycoplasma hominis* (mycoplasma-50).
- Reagent kit for the simultaneous detection of *Ureaplasma urealyticum* and *Mycoplasma hominis* (urea / MICS-Screen 2).
- Reagents for determination of **antibiotic susceptibility** *Ureaplasma urealyticum* (Ureaplasma-ACh).
- Reagents for determination of **antibiotic susceptibility** *Mycoplasma hominis* (mycoplasma-ACh)
- Reagent kit for the isolation of **gonococci culture** method (CSAs).
- Reagent kit for the visual detection of *Trichomonas vaginalis* (CBT).

Council of Young Scientists

Council of Young Scientists FBUN Institute of Epidemiology and Microbiology named after Pasteur was established December 15, 2008

Chairman of SMU: Elena Vasilyeva