

REVIEW ARTICLE

History of the Institute of Pathology “Prof. dr Đorđe Joannović” – 100 years of experience and work

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Summary

One hundred years after its establishment, the Institute of Pathology “Prof. Dr. Đorđe Joannović” remains the leading institution in Serbia and the region, where besides educating students and laboratory technicians, various state-of-the-art diagnostic procedures in the fields of histopathology, autopsy, and molecular pathology are conducted.

The Department of General Pathology and Pathological Anatomy was also founded in 1922. Dr Đorđe Joannović was the first full professor and the head of the department. After World War II, a joint department of four subjects was formed. An independent Department of Pathological Anatomy was reestablished in 1978, with academician Prof. Vladimir Kanjuh as the first head of the newly formed department. Teaching at the Department of Pathology has been conducted according to a new program since the academic year 2006/07 academic year. Since its beginnings, the Department of Pathology has supported students’ scientific research work and has been involved in facilitating professional and scientific international student exchange. Teaching of basic academic medical studies in English at the Department of Pathology has been ongoing since 1997. Within the department, there are specializations in Clinical Pathology and Medical Cytology, and in the academic year 2022/23 academic, the first generation of students in the “Pathological Basis of Diseases” doctoral program was enrolled.

Today, the Institute of Pathology is listed among the reference institutions of the Republic of Serbia. It possesses a laboratory for routine histological processing of biopsy and autopsy material, an immunohistochemistry laboratory, and a laboratory for molecular pathology. Members of the Department and the Institute of Pathology are authors of numerous professional and scientific publications. They have been involved in founding and working within important professional, health, and scientific institutions in the country and the region. Owing to its exceptional contributions to the development of medical science and practice, the Institute of Pathology was awarded the Order of St. Sava, 3rd class, in 2017.

Key words: Institute of Pathology, Prof. Dr Đorđe Joannović, pathology, Faculty of Medicine University of Belgrade



ESTABLISHMENT AND EARLY DAYS OF THE INSTITUTE OF GENERAL PATHOLOGY AND PATHOLOGICAL ANATOMY AND THE DEPARTMENT OF GENERAL PATHOLOGY AND PATHOLOGICAL ANATOMY

Currently, the Institute of Pathology at the Faculty of Medicine University of Belgrade is the largest and one of the oldest institutions in Serbia and former Yugoslavia. The history of the Institute of Pathology dates back to the year of 1920, with the comeback of Prof. Đorđe Joannnović (**Figure 1**) from the Faculty of Medicine in Vienna to Belgrade. His aim was participation in the establishment of the Faculty of Medicine in Belgrade. Two years later, in 1922, Prof. Joannnović founded the Institute of General Pathology and Pathological Anatomy (1,2,3). While some sources indicate that the Institute was founded in November 1921 (4), most sources cite the beginning of 1922 as the time of its establishment (1,2,3).



Figure 1. Prof. Đorđe Joannnović

In its initial years, the Institute did not have its own building. Educational, scientific, and professional activities began very modestly, in a single room of the Main Military Hospital in Belgrade, and later continued at the premises of the Pathology Department of the General State Hospital in Belgrade (1,3). The most significant event in the development of the Institute was its relocation to a purpose-built new building on April 22, 1926 (**Figure 2**). The construction of this building was started in 1923, according to the designs made by Prof. Đorđe Joannnović. The architects Petar Jovanović and Svetozar Jovanović, both professors at the Technical Faculty in Belgrade, designed the building. This facility met high standards of the time and was one of the best-equipped institutions of its kind in the world (3).



Figure 2. Newly built Institute of Pathology building in 1926.

In the newly constructed building, intensive scientific research work in the field of general and experimental pathology and pathological anatomy began. The Institute became the center of histopathological diagnostics. During this time, the Institute annually conducted thousands of clinical autopsies, referred from all clinics of the Faculty of Medicine, the departments of the General State Hospital, and the Hospital for Infectious Diseases (1).

Until the outbreak of the Second World War, the Institute of General Pathology and Pathological Anatomy experienced a rapid development, further expanding their activities. Prior to the Second World War, the Institute consisted of several departments: the autopsy department, pathological-histological department, experimental department, and biochemical department.

As the Institute was established as part of the Faculty of Medicine, all employed doctors were engaged in teaching from the moment of its inception. Before the Second World War, the Institute and the Department of General Pathology and Pathological Anatomy employed three professors, four associates, one laboratory technician, and one administrative officer (1,5). Prof. Joannnović simultaneously held the position of the Institute's director and the head of the Department of General Pathology and Pathological Anatomy. The department of experimental pathology was led by Prof. Ksenofon Šahović. Prof. Joannnović was also elected multiple times as the Dean of the Faculty of Medicine (1922/23, 1925/26, 1927/28, and 1928/29) (2,3). He was beloved and respected among students, went to excursions with them and served as the president of the Fund for Supporting Impoverished University Students (1,2). He even supported them during student demonstrations against government authorities in 1931, which aimed to preserve the autonomy of the University and improve students' material conditions. During the actions of the Progressive Student Movement in 1932, the Svetosavski Ball, traditionally organized on January 27th and planned to raise donations for the mentioned fund, was cancelled. There are different versions of what exactly happened that day, but it is certain that the events were linked to the tragic death of Prof. Joannnović, who

committed suicide in his office at the Institute building on January 28, 1932 (2,6,7,8).

After Prof. Joannović's death, Professor Ksenofon Šahović assumed the leadership of the Institute and the Department. In collaboration with Associate Prof. Dimitrije Tihomirov, he published the "Atlas of Pathological Histology" in 1933, dedicating it to the late Professor Joannović (2). Several years before the start of the Second World War, Professor Šahović initiated the publication of two journals: "Acta Pathologica" and "Acta Cancerologica Yugoslavica". From 1937 until the war began, the journal "Acta Pathologica" was published. The authors of professional and scientific papers were mostly doctors from the Institute of Pathology and doctors from clinics they collaborated with. The papers were printed in German, French, or English and illustrated with high-quality photomicrographs of histopathological specimens. The journal "Acta Cancerologica Yugoslavica" was published from 1939 to 1941 (2). Before the outbreak of the Second World War, the Department of Pathology had three professors: Prof. Ksenofon Šahović, who was promoted to full professorship in 1940, Dr. Dimitrije Tihomirov, who held the position of an associate professor, and Dr. Živojin Ignjačev, who held the position of an assistant professor (2,5).

TEACHING ACTIVITIES OF THE DEPARTMENT OF PATHOLOGY AFTER THE SECOND WORLD WAR

After World War II, the Department of Pathology continued its activities with new impulses and developments. It became a significant center for scientific research and education, both for medical students and for residents in pathology.

During this period, significant efforts were made to supply the Department with modern equipment and technology, which contributed to the improvement of histopathological diagnosis. The faculty members of the Department were engaged in scientific research in various areas of pathology, from histopathology to molecular pathology.

Educational programs at the Department of Pathology were refined and expanded in line with scientific advancements. In addition to educating students, the Department of Pathology provided training for doctors specializing in pathology.

With the advancement of technology, special emphasis was placed on molecular diagnostics and genetic research approaches in pathology. This field rapidly developed and became an essential part of modern medical pathology.

The Department of Pathology continued to actively participate in international collaborations, symposiums, and congresses. It further established itself as a hub for advancing knowledge in the field.

The Department's post-World War II activities were characterized by a commitment to excellence in both education and research, making significant contributions to

the field of pathology and medical science as a whole.

During World War II, the building of the Department of Pathology suffered significant damage. Bombardments caused damage to the lecture hall, histology laboratories, and the museum with numerous exhibits. Some laboratories were completely destroyed. After the war, the building was reconstructed. A new lecture hall, the largest at the Faculty of Medicine, was built, and the 4th floor was added to the building. In 1945, the department changed its name to the Institute of Pathology and Pathological Anatomy (1). However, even in the renovated and expanded Institute building, the space for the work of pathologists remained limited and insufficient. This was due to the fact that the building also accommodated the Institute of Pathological Physiology, the Institute of Medical Research of the Serbian Academy of Sciences and Arts (Serbian – *Srpska akademija nauka I umentnosti - SANU*), and the Faculty of Pharmacy (2,5).

After World War II, the functioning of the Institute and the Department was challenged by significant financial problems and a shortage of skilled staff. Considering all these factors, in 1948, it was decided to establish a unified Department for four subjects: Pathological Anatomy, Pathological Physiology, Oncology, and Forensic Medicine. Professor Ksenofon Šahović was appointed as the first head of this unified Department and held this position until his death in 1956. Following his passing, the role was taken over by Professor Julijana Bogičević, a professor of forensic medicine (until the moment the Department for forensic medicine became independent in 1957). Later, Professor Marija Višnjić Frajnd, Professor Živojin Ignjačev, and Professor Branka Stojanović from the Department of Pathological Physiology were heads of the Department. During the period of the unified Department, teaching of pathological anatomy included three types of exercises alongside theoretical classes: macroscopic diagnostics, microscopic diagnostics, and histopathological exercises (2,5) (Figure 3).



Figure 3. The team of the Institute of Pathology during the tenure of Prof. Živojin Ignjačev (head) and Prof. Marija Višnjić Frajnd.

The independent Department of Pathological Anatomy was reestablished in 1978, with Academician Profes-

sor Vladimir Kanjuh as its head. Changes were made to the teaching methods, including the introduction of macroscopic seminars in place of the previous macroscopic diagnostics exercises (5). Subsequent heads of the Department included: Professor Miomir Leposavić, Professor Milica Đorđević Tešanović, Professor Stevan Nešić, Professor Miomir Janjić, Professor Vesna Jovanović, Professor Mirjana Atanacković, Professor Ivan Boričić, Professor Milica Skender Gazibara, Professor Svetislav Tatić, Professor Dejan Oprić, Professor Jelena Sopta, and on the centenary, Associate Professor Radmila Janković (8,9) (Figure 4).



Figure 4. Associate Prof. Radmila Janković, Head of the Department of Pathology on its centenary

Significant changes to the curriculum were introduced with the accreditation of the teaching program in the academic year 2005/6. Since then, students have had four types of mandatory exercises: autopsy exercises, macroscopic seminars, histopathological exercises, and exercises in the electronic classroom. In addition, a greater number of elective subjects from various areas of pathology were introduced for third-year students (9). Since its establishment the Department of Pathology has supported student scientific research, and it has also been involved in implementing professional and scientific international student exchange. In addition to the Department offering courses in the Serbian language, Studies in English were established in 1997, following the same curriculum as the Serbian-language studies. The first head of the Department of Pathology in English was Prof. Ana Laban, followed by Prof. Milica Skender Gazibara, Prof. Zorica Stojšić, and currently Prof. Nada Tomanović (8,9). Since 2013, the Department has been delivering teaching for Basic Academic Studies in Nursing, led by Assistant Prof. Dragan Mitrović and currently Associate Prof. Ljiljana Bogdanović (9).

Postgraduate education was officially introduced to the Faculty of Medicine in the academic year 1947/48.

Specialization in pathological anatomy was the first form of postgraduate education introduced in this period, and Dr. Milan Arambašić was the first physician at the Faculty of Medicine in Belgrade to officially pass a specialist exam (2). The two-semester theoretical teaching for specialist trainees in pathological anatomy was formally organized for the first time in 1979 (2,5). However, the Department for postgraduate education in pathological anatomy was officially established only in 2003 (5,8). Prof. Marija Havelka Đuković was appointed as the head of this Department. After her retirement, this role was taken over by Prof. Dejan Oprić, Prof. Tatjana Terzić, and currently Associate Prof. Emilija Manojlović Gačić. In 2010, the specialization name “Pathological Anatomy” was officially changed into “Pathology”. Starting from the academic year 2008/9, two programs of sub-specialisation were introduced to the Department: Clinical Pathology and Medical Cytology. In the academic year 2022/23, the first generation of doctoral candidates was enrolled in the newly accredited module “Pathological Basis of Diseases” (9).

HEALTHCARE ACTIVITIES OF THE INSTITUTE OF PATHOLOGY AFTER WORLD WAR II

After World War II, the director of the Institute of Pathology was Prof. Ksenofon Šahović, and he remained in that position until his passing in 1956. Following him, the position of director was held by Prof. Marija Višnjić-Frajnd, and then by Prof. Živojin Ignjačev, who returned to Belgrade from Sarajevo (where he was the director of the Institute of Pathology). Subsequently, the directorship was held by Prof. Milan Arambašić, Prof. Miodrag Sindić, Prof. Milorad Išvaneski, Prof. Miomir Janjić, Prof. Stevan Nešić, Prof. Milica Đorđević, Prof. Slobodan Dožić, Prof. Jovan Vasiljević, Prof. Dubravka Cvetković Dožić, Prof. Gordana Basta Jovanović, Prof. Sanja Radojević Škodrić, Prof. Nada Tomanović, Assoc. Prof. Duško Dunđerović, and Associate Prof. Sofija Glumac on the centenary of its founding (Figure 5).

Healthcare activities of the Institute in the period after World War II followed an upward trajectory. The number of staff members was limited, which initially constrained the ability of pathologists to engage in highly specialized areas. However, the situation improved in 1960s with enhancements in human resources and material support, paving the way for focused endeavors within specific fields of pathology (Figure 6).

Over time, specialized teams were formed to focus on pathology of various organ systems. Cardiovascular pathology was among the first fields in which individual pathologists at the Institute specialized. Academician Prof. Vladimir Kanjuh led this area, serving as the head of the cardiovascular pathology team (9).



Figure 5. Associate Prof. Sofija Glumac, Director of the Institute of Pathology on its centenary

Academician Kanjuh pursued training in cardiac pathology under the guidance of renowned figure Prof. J. E. Edwards in St. Paul/Minneapolis as a fellow of the American National Institutes of Health. He also pursued training in London, Paris, and Amsterdam. He discovered and described two new congenital heart defects, one of which was named after him - the Kanjuh anomaly. Numerous collaborators and educators passed through the “Vladimir Kanjuh School of Cardiac Pathology,” which served as a Reference Center for cardiovascular pathology, and some of them continued successful careers abroad. Members of his research team included Prof. Gordana Tucaković, Prof. Sofija Lastić-Maletić, Prof. Dragan Velimirović, Prof. Jovan Vasiljević, and Assoc. Prof. Radmila

Jovanović. Additionally, Academician Kanjuh founded and organized the Museum and Registry of Congenital Heart Defects, featuring over 1500 macroscopic specimens. He introduced histopathological analysis of lung biopsies in patients with congenital heart defects to determine operability. Notably, the discovery of “plexiform lesions” (by Heath-Edwards) became a contraindication for surgery in patients with congenital heart defects. Cases were received from all over former Yugoslavia.

Thanks to the “Vladimir Kanjuh School of Cardiac Pathology,” the “Belgrade Cardiology School” gained significance and a higher level of integrated cardiology perspective. Numerous award-winning postgraduate textbooks were published (9,10,11). Also, owing to the efforts of Prof. Vasiljević, endomyocardial biopsies became part of the routine work of this team. This effort fostered intense collaboration with the Institute for Cardiovascular Diseases Dedinje and the Clinic for Cardiovascular Diseases at the University Clinical Center of Serbia (UCCS). Prof. Sofija Glumac and Assist. Prof. Milena Jovanović are continuing the tradition (9).

Many pathologists at the Institute were dedicated to the field of pulmonary pathology in its early decades. However, only Prof. Miomir Lepsavić, Prof. Miloš Bašić, Prof. Stevan Nešić, and Prof. Mirjana Oklobdžija gained focused expertise in this area of pathology. After the untimely passing of Prof. Oklobdžija, Assistant Prof. Dragan Mitrović and his collaborator Assistant Prof. Ivana Savić continued to contribute to lung pathology. Today, Associate Prof. Sofija Glumac and clinical and research assistant Dr Milena Jovanović are subspecialized in pulmonary pathology, fostering close collaboration with the Clinic for Pulmonary Diseases and Tuberculosis



Figure 6. The staff of the Institute of Pathology at the moment of the celebration of the centenary

at the UCCS, as well as Assistant. Prof. Ivana Savić (9).

Prof. Miodrag Sindić was the founder of the Nephropathology and Uropathology Laboratory at the Institute of Pathology and he pursued advanced studies in Germany as a scholarship recipient of the Alexander von Humboldt Foundation. Prof. Sindić was also a founding member of the Institute of Urology and Nephrology at the UCCS. Owing to Prof. Sindić, the Institute of Pathology was the first to implement methods such as immunofluorescence, polarizing microscopy, and electron microscopy for the analysis of renal biopsies (10). Numerous collaborators passed through this laboratory, with Prof. Gordana Basta Jovanović and Prof. Jasmina Marković Lipkovski dedicating their entire careers to it, and leaving their personal imprint. Owing to Prof. Marković Lipkovski's dedication, various molecular methods were introduced at the Institute of Pathology. In 1990s, owing to the efforts of Prof. Dimitrije Brašanac and Prof. Marković Lipkovski, immunohistochemical staining was introduced into routine diagnostics. Today, the team for nephropathology and uropathology is led by Prof. Sanja Radojević Škodric, with other members including Associate Prof. Ljiljana Bogdanović, Assistant Prof. Jelena Filipović, Assistant. Prof. Maja Životić, and Teaching and research assistant. Dr Gorana Nikolić (9).

The field of bone and soft tissue pathology at the Institute of Pathology was established by Prof. Milorad Išvaneski, Prof. Mirjana Atanacković, and Prof. Dragoljub Bacetić. Currently, the members of this team are Prof. Jelena Sopta, with teaching and research assistants. Dr Ljubica Simić and Milena Mihajlović. The Institute of Pathology is the only specialized laboratory for bone and soft tissue pathology in the country and the region. Collaborations have been established with the Institute for Orthopedic Diseases Banjica (IODB), the Clinic for Traumatology and Orthopedics at the University Clinical Center, and the Department of Orthopedics at the University Children's Hospital Tiršova. Prof. Sopta has been a long-standing member of the sarcoma committee at the IODB (9,10).

The field of gastrointestinal pathology and pancreatic pathology developed as distinct areas owing to Prof. Ana Laban and Prof. Zorica Stojšić. Today, this team is composed of Associate Prof. Radmila Janković accompanied with clinical and research assistants Dr Jovan Jevtić and Miloš Đuknić. They collaborate with the University Children's Hospital Tiršova, the Infectious Clinic of the UCCS, the Clinical-Hospital Center "Dr. Dragiša Mišović," and the Clinical-Hospital Center Bežanijska kosa. Prof. Janković is a member of the Digestive Tumor Council at the Clinical-Hospital Center "Dr. Dragiša Mišović" (9).

Prof. Ana Begić Janeva is the founder of modern hepatopathology at the Institute of Pathology. She was a member of the first liver transplantation team in Serbia in 1990s, along with Prof. Ivan Boričić. The development

of this area is continued by Prof. Ivan Boričić and Prof. Nada Tomanović, who collaborate with the Infectious Clinic of the UCCS and the Internal Medicine A Clinic of the UCCS (9,10).

Besides hepatopathology, the same team deals with head and neck pathology. Today, the team for hepatopathology and head and neck pathology consists of Prof. Nada Tomanović and her collaborator, teaching and research assistant Dr Ana Marija Tomić. Prof. Tomanović is a permanent member of the Tumor Council for Head and Neck Tumors at the Otorhinolaryngology Clinic of the UCCS (9).

Prof. Miomir Janjić was engaged in gynecological pathology at the Institute of Pathology. The current members of the team for gynecological pathology are Prof. Dejan Oprić and his collaborators, Assistant professor Danilo Obradović, who serve as consultants for the Gynecological-Obstetric Clinic of the UCCS. Recently teaching and research assistant dr Isidora Filipović joined the team. Dr Danilo Obradović is also specialized in placental pathology (9).

The pioneer of modern hematopathology at the Institute of Pathology is Prof. Vesna Jovanović, and her successors are Prof. Tatjana Terzić with her collaborator Assist. Prof. Novica Boričić. This team, due to the Institute's well-equipped facilities, can apply contemporary recommendations related to diagnosing hematologic neoplasms and detect specific markers of interest for targeted therapy (8,9).

The initiator of the team for endocrine pathology was Prof. Marija Jančić Zguricas. She was also one of the founders of the Department of Clinical Pathology at the Second Surgical Clinic of the UCCS (9,10). Prof. Marija Havelka Đuković and Prof. Svetislav Tatić were members of the team for endocrine pathology and pioneers of modern breast lesion diagnostics. They implemented immunohistochemical staining in the routine diagnostics of breast lesions. In this team today, alongside Prof. Tatić, work Associate Prof. Duško Dunderović, Assoc. Prof. Maja Životić and Associate professor Mirjana Prvanović (9).

A large number of skin biopsies are diagnosed annually at the Institute of Pathology. This area was developed and improved by Prof. Dimitrije Brašanac. Prof. Brašanac predominantly focuses on tumor dermatopathology, especially melanocytic skin lesions. He collaborates daily with the Clinic for Burns, Plastic and Reconstructive Surgery of the UCCS. He is also a coordinator for histopathological diagnosis in the Intersectoral Board for Melanoma of the Serbian Medical Society. Assoc. Prof. Martina Bosić is also engaged in the dermatopathology team. Her specialization is inflammatory skin diseases, which leads to excellent collaboration with the Dermatovenereology Clinic of the UCCS (9).

There has been a long tradition of a neuropathology laboratory at the Institute of Pathology since 1970. Its founder was Prof. Slobodan Dožić. The Neuropathology

and Neuromuscular Diseases Laboratory was declared a reference laboratory in the territory of former Yugoslavia in 1986 (10,11). This laboratory applied all contemporary diagnostic methods, including enzyme histochemical staining and the use of an electron microscope that the Institute possessed in the 1980s and 1990s (11). Prof. Dubraka Cvetković Dožić and Prof. Milica Skender Gazibara were part of this unique team, and today this area is led by Associate Prof. Emilija Manojlović Gačić. The team members have a longstanding collaboration with the Neurosurgery Clinic of the UCCS. Associate Prof. Manojlović Gačić specializes in pituitary pathology and she introduced the latest diagnostic principles after training with eminent pathologists in this field, including Jacqueline Trouillas in Lyon, France, and Oliveira Casar-Borota in Uppsala, Sweden, who authored the WHO classification. She actively participates in the International Pituitary Pathology Club and she contributed to changing the nomenclature of pituitary tumors, which was adopted in the latest WHO classification of endocrine tumors. Besides her collaboration with neurosurgery, Prof. Skender Gazibara established intensive cooperation with the University Children's Hospital Tirsova, particularly in diagnosing disorders of intestinal motility and Hirschsprung's disease. After her retirement, the diagnosis of intestinal motility disorders was taken over by Associate Prof. Radmila Janković (9).

Since 2006, the official name of the institute was the "Institute of Pathology". In 2017, the name of the institution was officially changed and extended to include the name of its founder, Prof. Dr. Đorđe Joanović (9). In the jubilee year of 2022, the Institute employed 24 doctors, 2 molecular biologists, 14 laboratory technicians, and 23 members of administrative and non-medical staff. The Institute currently has two autopsy rooms and a mortuary with cooling equipment for storing deceased individuals. The number of autopsies conducted in the first decades of the Institute's activity was quite high, amounting to several thousand annually. However, there was a significant decline in the number of autopsies during 1980s and 1990s, maintaining a lower count until the first decade of the 21st century. Around 2010, the number of autopsies started to rise again, positioning the Institute of Pathology as an institution that performed the highest number of clinical autopsies annually in the country and the region. The number of biopsy materials for histopathological analysis has consistently increased since the institute's founding, along with the complexity of diagnostic methods (5,6,12).

Presently, the Institute is equipped with three main laboratories: a laboratory for routine histological processing of biopsies and autopsy material, an immunohistochemistry laboratory, and a molecular pathology laboratory. Owing to these facilities, the Institute is capable of adhering to global diagnostic standards. The laboratory for routine histological processing of biopsies processes over 25.000 biopsies and cytological samples annually

(including ex tempore biopsies). The immunohistochemistry laboratory stains preparations from the institute's biopsies and also provides staining services for numerous institutions in Belgrade and the region. On a daily basis, 500-600 slides are immunohistochemically stained. Most histopathological preparations are routinely stained with hematoxylin and eosin, and in addition, about 30 different special histochemical stains are used (9).

The Institute of Pathology employs licensed laboratory technicians. In addition to preparing specimens for diagnosis, they participate in preparing specimens used for educational purposes, as well as in the production of specimens that are part of scientific research and doctoral dissertations. Practical training for laboratory technicians from secondary medical schools takes place in the laboratories. Internships are offered to students who have completed secondary and higher medical schools. Supplementary training is also provided to laboratory technicians from other healthcare institutions in the country and the region (8,9).

Over the past decade, the Institute has experienced significant progress, particularly with the establishment of the Molecular Pathology Laboratory. The creation of this laboratory involved the participation of Associate Prof. Martina Bosić and a molecular biologist and physiologist Dr Sanja Ćirović, with the support of Prof. Jasminka Marković Lipkovski and the then director of the Institute, Prof. Sanja Radojević Škodrić. Since 2018, another molecular biologist and genetics specialist, Marija Denčić Fekete, has been employed in the laboratory. Finally, molecular biologist Milica Radovanović Komnenić accompanied the team for molecular pathology in 2022. The Molecular Pathology Laboratory conducts a large number of analyses annually. In the year marking the centenary of the institute's founding, the Institute performed 2450 analyses of fluorescence in situ hybridization, 894 PCR analyses, and 88 cytogenetic analyses. The Institute of Pathology serves as a reference institution for molecular testing, which is significant not only for tumor diagnosis and prognosis (especially sarcomas, lymphomas, and central nervous system tumors) but also for personalized approaches and targeted therapy for various malignant tumors (9).

THE ROLE OF THE INSTITUTE OF PATHOLOGY IN THE DEVELOPMENT OF PATHOLOGY IN THE REGION

The Institute of Pathology has played a significant role in the support and the constitution of numerous educational and healthcare institutions throughout the region. The Faculty of Medicine and collaborators from the Department of Pathology were involved in establishing departments of pathology at medical faculties in Novi Sad, Kragujevac, and Pristina, as well as at the School of Dental Medicine in Belgrade. They also contributed to teaching



Figure 7. Order of St. Sava, Third Class, awarded to the Institute of Pathology in 2017.

at these faculties and at the Medical Faculty in Podgorica and the Dental Faculty in Novi Sad (2,5,10,12). Prof. Đorđe Joannović and Prof. Ksenofon Šahović were among the founders of the Yugoslav Society for the Study and Suppression of Cancer in 1927. Prof. Šahović was not only a founder of the Institute of Pathological Physiology but also its first director. He also founded the Institute of Oncology and Radiology of Serbia in 1948, establishing the foundations of modern oncology in the country (2,3). He remained at the helm of this institution until his death. Prof. Marija Višnjic Frajnd succeeded Prof. Šahović in this role (2,12). Members of the Department of Pathology were part of the founding committee of the Association of Yugoslav Pathologists. They were also involved in the establishment and work of the Pathologists' Section of the Serbian Medical Society (SMS), serving as presidents and secretaries of the section. Prof. Živojin Ignjacev served as the first president of the Pathologists Section of the SMS (12). Many faculties and collaborators from the Department of Pathology have received education and specialization in various areas of pathology both domestically and internationally. They have participated in numerous congresses, courses, schools, and symposia as both attendees and lecturers. Prof. Mirjana Atanacković and Prof. Jelena Sopta organized a course in bone pathology with international participation in 2005. European School of Pathology courses were held annually from 2009 to 2019 in Belgrade, under the organization of Prof. Jovan Vasiljević and certain faculty and collaborators from the Institute of Pathology. Owing to the efforts of Prof. Jovan Vasiljević, the European Congress of Pathology was held for the first and only time in Belgrade in 2015 (9).

Professor Joannovic was an associate member of the Serbian Royal Academy. Importantly, Professors Šahović and Kanjuh were elected as regular members of the Department of Medical Sciences of the SANU (2,3). Profes-

sors of the Department of Pathology have also been or are still members of various committees within SASA. For example, Professors Gordana Tucakovic and Sofija Lastic Maletic are members of the Committee for Cardiovascular Pathology at SASA, with Academician Vladimir Kanjuh serving as its president. Professor Miodrag Sindic was a permanent member of the Committee for Endemic Nephropathy at SASA from 1971 until his passing (10,13). The Committee for Tumors of the Urinary System at SASA includes Academician Vladimir Kanjuh and Professor Jasmina Markovic Lipkovski (13).

Professors Marija Jancic Zguricas and Prof. Gordana Tucakovic were regular members of the Academy of Medical Sciences of the Serbian Medical Society (9,10). Professor Jelena Sopta is a member of the Scientific Society of Serbia, while Professor Jovan Vasiljevic has been not only a long-standing member but also the president of this society since 2016 (9).

Members of the Institute of Pathology have actively participated in expert committees at the level of the Republic of Serbia, such as the Republic Expert Committee for Pathology. The current president of this committee is Associate Prof. Dusko Dunderovic, and several members of the Department of Pathology are part of it. Since December 2017, Prof. Sanja Radojevic Skodric has been the director of the Republic Health Insurance Fund (9).

It can be concluded that the Institute of Pathology "Prof. Dr. Đorđe Joannovic" has played a central role in the development of pathology in the country and the region since its establishment. Throughout its century-long history, the teachers and collaborators of the Institute of Pathology "Prof. Dr. Đorđe Joannovic" have successfully faced numerous challenges, preserving traditional values while simultaneously keeping up with modern trends in the field and science, continuously educating themselves and passing their knowledge to generations of doctors.

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ISTORIJAT INSTITUTA ZA PATOLOGIJU “PROF. DR ĐORĐE JOANNOVIĆ” - 100 GODINA ISKUSTVA I RADA

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Sažetak

Sto godina nakon svog osnivanja, Institut za patologiju „Prof. dr Đorđe Joannović“ predstavlja vodeću ustanovu u Srbiji i regionu u kojoj se pored edukacije studentata i laboratorijskih tehničara vrše različite najsavremenije dijagnostičke procedure iz oblasti histopatološke, autopsijske i molekularne patologije.

Katedra za opštu patologiju i patološku anatomiju je takođe osnovana 1922 godine. Prvi redovni profesor i prvi šef Katedre bio je dr Đorđe Joannović. Nakon Drugog svetskog rata formirana je zajednička Katedra za četiri predmeta. Samostalna Katedra za patološku anatomiju ponovo je formirana 1978. godine, a prvi šef novoformirane Katedre bio je akademik prof. dr Vladimir Kanjuh. Na Katedri za patologiju nastava se po novom programu odvija od 2006/07. školske godine do danas. Katedra za patologiju od osnivanja podržava naučno-istraživački rad studenata, a uključena je i u realizaciju stručne i naučne međunarodne razmene studenta. Nastava osnov-

nih akademskih studija medicine na engleskom jeziku na Katedri za patologiju odvija se od 1997. godine. U okviru Katedre postoje uže specijalizacije Klinička patologija i Medicinska citologija, a školske 2022/23. upisana je prva generacija studenata doktorskih studija „Patološke osnove bolesti“.

Institut za patologiju se danas nalazi na listi referentnih ustanova Republike Srbije. Raspolaze laboratorijom za rutinsku histološku obradu biopsijskog i autopsijskog materijala, imunohistohemijskom laboratorijom i laboratorijom za molekularnu patologiju.

Članovi Katedre i Instituta za patologiju su autori brojnih stručnih i naučnih publikacija. Učestvovali su u osnivanju i radu važnih stručnih, zdravstvenih i naučnih institucija u zemlji i regionu. Za naročite zasluge i doprinos u razvoju medicinske nauke i prakse Institut za patologiju je odlikovan Sretenjskim ordenom trećeg stepena 2017. godine.

Ključne reči: Institut za patologiju, prof. dr Đorđe Joannović, patologija, Medicinski fakultet

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