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Leonid Iosifovich Smirnov — outstanding soviet scientist-neuromorphologist

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Abstract. The article is dedicated to the life and creative path of an outstanding Soviet scientist-pathologist, organizer and educator, one of the founders and classics of Soviet neuromorphology, Doctor of Medical Sciences, Professor, corresponding member of the USSR Academy of Medical Sciences Leonid Iosifovich Smirnov (03/08/1889 — 01/08/1955), who was born in the district Soligalich of the Kostroma province in a large family of a priest, archpriest and rector of the Soligalich Cathedral of the Nativity of the Blessed Virgin Mary and his mother Smirnova (nee Krutikova) Alexandra Evgenievna. In 1918, his father was repressed and shot as a "perpetrator of a counter-revolutionary uprising". Leonid received his primary education at a parochial school and a theological college. In 1906, he passed the external matriculation exam at the Kostroma Gymnasium and entered the Physics and Mathematics Faculty of the Imperial Saint Petersburg University. After graduating, in 1910 he became a student at the Medical Faculty of the University of Warsaw, and in 1914, due to the events of the First World War, he transferred to the Faculty of Medicine of the Imperial Moscow University and successfully graduated, receiving a doctor's diploma in 1916. From 1916 to 1938, L.I. Smirnov worked in hospitals and medical institutes in various positions. From 1938 to 1955, at the invitation of N.N. Burdenko and under his patronage, L.I. Smirnov headed the Morphological Department of the Central Neurosurgical Institute. In 1940, the Higher Attestation Commission awarded Leonid Iosifovich a doctorate degree without defending his dissertation. In 1940, L.I. Smirnov was a voluntary participant in the war with Finland and from 1941 to 1944 in the Great Patriotic War with Nazi Germany. The scientist's scientific interests throughout his creative career were the study of issues of central nervous system pathology. L.I. Smirnov is the author of more than 80 scientific publications, including a number of monographs that laid the foundation for neurophysiology and contributed greatly to the study of the pathomorphology of mental, traumatic, and tumor diseases of the brain and spinal cord. The remarkable modesty and extraordinary work ethic of this unique scientist, who made significant contributions to medicine, will serve as an example for the younger generation of scientists. L.I. Smirnov died on January 8, 1955, at the age of 66, and was buried at the Donskoy Cemetery in Moscow.

Keywords: Leonid Iosifovich Smirnov, an outstanding Russian scientist-pathologist, founder of Soviet neuromorphology, organizer, educator

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Персоналии

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Леонид Иосифович Смирнов — выдающийся советский ученый-нейроморфолог

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Резюме. Статья посвящена жизненному и творческому пути выдающегося отечественного ученого-патолога, организатора и педагога, одного из основоположников и классиков советской нейроморфологии, доктора медицинских наук, профессора, члена-корреспондента АМН СССР Леонида Иосифовича Смирнова (08.03.1889 — 08.01.1955), родившегося в уездном Солигаличе Костромской губернии в многодетной семье священника. Отец — протоиерей и настоятель Солигаличского собора Рождества Пресвятой Богородицы, мать — Смирнова (урожденная Крутикова) Александра Евгеньевна. В 1918 году его отец был репрессирован и расстрелян как «виновник контрреволюционного восстания». Начальное образование Леонид получил в церковно-приходской школе и духовном училище. В 1906 году он сдал экстерном экзамен на аттестат зрелости в гимназии Костромы и поступил на физико-математический факультет Императорского Санкт-Петербургского университета. Окончив его, в 1910 году стал студентом медицинского факультета Варшавского университета, а в 1914 году из-за событий Первой мировой войны перевелся на медицинский факультет Императорского Московского университета и успешно окончил его, получив диплом лекаря в 1916 году. С 1916 по 1938 год Л.И. Смирнов работал в больницах и медицинских институтах на различных должностях. С 1938 по 1955 год по приглашению Н.Н. Бурденко и под его протекцией Л.И. Смирнов возглавил морфологическое отделение Центрального нейрохирургического института. В 1940 году Высшая аттестационная комиссия присудила Леониду Иосифовичу докторскую степень без защиты диссертации. В 1940 году Л.И. Смирнов — добровольный участник войны с Финляндией, с 1941 по 1944 год — Великой Отечественной войны с фашистской Германией. Научные интересы ученого на протяжении всей его творческой деятельности включали вопросы патологии центральной нервной системы. Л.И. Смирнов — автор более 80 научных публикаций, в том числе ряда монографий, заложивших фундамент нейрофизиологии. Леонид Иосифович много сделал в изучении патоморфологии психических, травматических и опухолевых заболеваний головного и спинного мозга. Удивительная скромность и чрезвычайная работоспособность этого неповторимого ученого, внесшего значительный вклад в медицину, будут примером для молодого поколения ученых. Л.И. Смирнов умер 8 января 1955 года на 66-м году жизни и похоронен на Донском кладбище г. Москвы.

Ключевые слова: Леонид Иосифович Смирнов, выдающийся отечественный ученый-патолог, основоположник советской нейроморфологии, организатор, педагог

Источник финансирования. Автор заявляет об отсутствии внешнего финансирования при проведении исследования.

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On January 8, 2025 we have celebrated the 70th anniversary of the death of the outstanding Russian pathologist, scientist, educator and organizer, one of the founders and classics of Soviet neuromorphology, Corresponding Member of the USSR Academy of Medical Sciences, Doctor of Medical Sciences, Professor Leonid Iosifovich Smirnov (Fig. 1) [1].

Leonid Iosifovich Smirnov was born on March 8 (according to the Julian calendar) in 1889 in the district of Soligalich in the Kostroma province (now the Kostroma region) of the Soligalichsky district was born into a large family of a priest, archpriest and rector of the Soligalichsky Cathedral of the Nativity of the Blessed Virgin Mary and his mother, Smirnova (née Krutikova) Alexandra



Fig. 1. **Leonid Iosifovich Smirnov (03/08/1889–01/08/1955). Photo of the 1950s of theXX century. URL: https://bibl-kostroma.ru/фотографии/галереи-17-19/nggallery/page/5 (accessed: 11/05/2025).**



Fig. 2. **Leonid Iosifovich Smirnov's father — Iosif Sergeevich Smirnov. Photo from the Soldovskikh family archive (Soligalich)**



Fig. 3. **Leonid Iosifovich Smirnov's mother is Alexandra Evgenievna Smirnova. Photo of the Soldovskikh family archive (Soligalich) of the 10s of the XX century**

Evgenievna, the daughter of an official, who belonged to the clergy by birth (Fig. 2, 3)[1].

Father, Smirnov Iosif Sergeevich (03/03/1864 — 03/07/1918), was born in the village of Zharki, Kostroma district, Kostroma province in the family of fr. Sergiy Smirnov is a priest of the Church of the Assumption of the Same Faith. In 1871, fr. Sergiy and his mother died almost simultaneously. Six of their orphans were taken in by the unmarried 30-year-old sister of the deceased mother, Evdokia Osipovna Florenskaya, who lived in her own house in the village of Teterinsky in the Nerekhtsky district.

In 1874, Iosif entered the Soligalich Theological College, after graduating in 1879, he was enrolled in the Kostroma Theological Seminary for state support (Fig. 4). Throughout his seminary years, studying was not easy for Iosif Smirnov, which can apparently be explained by the difficult situation of the orphan [2].

After graduating from the seminary, Iosif Sergeevich was appointed to the position of assistant teacher at the parish school in Soligalich, and on June 2, 1886, he married Alexandra Krutikova. The wedding of the young couple took place in the Cathedral of the Nativity of the Blessed Virgin Mary. The Smirnov family settled in the house that belonged to the wife of fr. Iosif. Subsequently, the Smirnov couple had eight children, namely: Sergiy (04/23/1887), Leonid (03/08/1889 — 01/08/1955; Fig. 5), Anna (01/01/1891, died in 1913), Elizaveta (10/06/1892), Maria (03/28/1894), Nikolay (01/11/1899), Natalia (03/09/1902) and Serafim (11/14/1904)[2].

[1] Dudin V.A. Our countrymen. L.I. Smirnov. URL: https://soligalich.prihod.ru/2015/03/08/v-a-dudin-nashi-zemlyaki-l-i-smirnov/ (accessed: 11/05/2025).

[2] Smirnov Iosif Sergeevich. Drevo. URL: https://drevo-info.ru/articles/13674237.html?ysclid=mi0nv9r489108666594 (accessed: 11/15/2025).

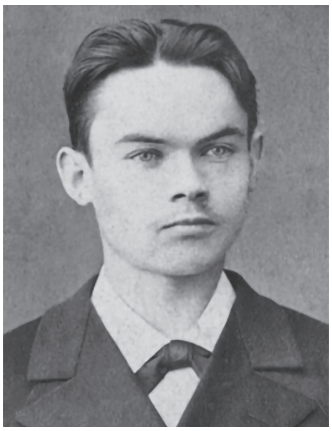


Fig. 4. **Iosif Smirnov is a graduate of the Kostroma Theological Seminary. Photo from 1883. URL: https://bibl-kostroma.ru/фотографии/галереи-17-19/nggallery/page/5 (accessed: 11/05/2025)**



Fig. 5. **Leonid Smirnov, son of Archpriest Iosif. Photo of the 10s of the XX century. URL: https://bibl-kostroma.ru/фотографии/галереи-17-19/nggallery/page/5 (accessed: 05.11.2025)**

On June 22, 1886, fr. Iosif was ordained a deacon by Bishop Alexander (Kulchitsky) of Kostroma and Galich, and on June 24 of the same year, a priest by the same bishop and assigned to the clergy of the Cathedral of the Nativity of the Blessed Virgin Mary in Soligalich.

Since 1888, fr. Iosif began to provide free spiritual care to prisoners held in the Soligalich prison castle. In 1897, the Nikolsky prison church was built, which was consecrated in January 1898 and became attached to the Cathedral of the Nativity of the Blessed Virgin Mary.

In 1895, a parish school was opened at the cathedral, where fr. Iosif became a religious teacher, and in 1904 he was appointed director of the school.

From 1896 to 1907, fr. Iosif served as an observer of parish schools in the Soligalich district.

On September 27, 1905, he was appointed rector of the Cathedral of the Nativity of the Blessed Virgin Mary in Soligalich, and on July 22, 1907, he was elevated to the rank of archpriest.

From 1906 to 1907 — a deputy of the City Duma, since August 1907 — a member of the district sanitary-executive commission of the Soligalich district, since 1909 — a deputy of the Soligalich district assembly, a member of the district committee of guardianship for public sobriety and a member of the board of the Soligalich theological college, since 1911 — a law teacher of the city college and real college, and on June 25, 1914 he was appointed dean of the Bogoroditse-Feodorovsky Monastery. Archpriest Iosif Smirnov performed many other church and public duties, deservedly enjoyed the respect and love of parishioners and was marked various awards.

At the end of February 1918, an attempt by the Soviet authorities to plunder and effectively liquidate the Bogoroditse-Feodorovsky Monastery led to an uprising in the city, as a result of which power in the city passed to a temporary council, but its activities lasted only a few days. Upon the arrival of the punitive detachment in the city, began arresting of “counter-revolutionaries”, including the local clergy, followed by a massacre.

In March, archpriest Iosif Smirnov was sentenced to execution by the military tribunal of the Soligalich Military District as “a culprit of a counterrevolutionary uprising”. Shot on March 7, 1918 in Soligalich. The execution took place late at night on the territoty of the Nikolsky prison church, the construction of which fr. Iosif had done so much. The report of the managing bishop Evdokim (Meshchersky) states that those shot were “so mutilated that, according to eyewitnesses, not a single corpse could be recognized. The executed martyrs were buried almost naked in one pit without a funeral service, and there was no one to perform the funeral service: the clergy of the city of Soligalich are in hiding and are being sought”. Those executed were buried in a mass grave in the city cemetery, near the walls of the Peter and Paul Church, early in the morning on March 8. A cross and a fence were erected at the site of the mass grave, which were demolished by atheists in the thirties. The cross on the grave was restored in 1996 (Fig. 6).

On July 4, 1996, Iosif Sergeevich Smirnov was rehabilitated by the Prosecutor’s Office of the Kostroma Region for the 1918 repressions and canonized as a new martyr and confessor of Russia in August 2000 at the Bishops’ Council of the Russian Orthodox Church[1].

Mother — Alexandra Evgenievna Smirnova (née Krutikova), widow of fr. Iosif, lived with her children for

[1] Smirnov Leonid Iosifovich. Wikipedia. URL: https://ru.wikipedia.org/wiki/Смирнов,_Леонид_Иосифович (accessed: 06/10/2025).



Fig. 6. **The cross on the mass grave of the victims of the shooting. Photo from 2003. URL: https://drevo-info.ru/articles/13674237.html?ysclid=mnqno9pmk1661378100 (accessed: 11/05/2025)**



Fig. 7. **Leonid Iosifovich Smirnov with his wife and son. Photographer I.I. Nedeshev, Petrograd, 1915–1917. URL: https://vk.com/wall-98221643_387132 (accessed: 09/20/2025)**

some time in Soligalich and died of a stroke in Kyiv in November 1943.

Their son, Leonid Iosifovich Smirnov, was married to Ekaterina Konstantinovna Smirnova (née Kalaganova), who was also from Soligalich and died in 1967. They had an only son, Iosif (Fig. 7) [3].

Leonid received his primary education at a parochial school and a theological college, which he graduated in 1902. Then he studied at the Kostroma Theological Seminary, but was expelled from it in 1905. In 1906, Leonid passed the external matriculation exam at the Kostroma gymnasium and entered the Physics and Mathematics Faculty of the Imperial Saint Petersburg University. After graduating, in 1910 he became a student at the Medical Faculty of the Warsaw University, and in 1914, due to the events of the First World War, he transferred to the Medical Faculty of the Imperial Moscow University (IMU) and successfully graduated it, receiving a doctor's diploma in 1916.

From 1916 to 1920, he was a resident at the Moscow Nerve Clinic, which were headed by IMU Professors V.A. Muratov and G.I. Rossolimo. In 1920, Leonid Iosifovich moved to Kursk, where he headed the Nervous Department of the Psychiatric Hospital and was also a prosector there. In 1925 — an Associate Professor at the Kiev Medical Institute and simultaneously the head of the histopathological laboratory of the Institute for Advanced Medical Training and a prosector at the Kiev Psychiatric Hospital. From 1932 to 1938 — the head of the Pathology Department at the Psychoneurological Faculty of the 2nd Kharkov Medical Institute and a prosector of the Psychoneurological Academy.

In 1938, at the suggestion of N.N. Burdenko, L.I. Smirnov was transferred to Moscow and from 1938 to 1955 headed the Morphological Department of the Central Neurosurgical Institute (CNHI) — now the "National Medical Research Center of Neurosurgery named after Academician N.N. Burdenko" of the Ministry of Health of the Russian Federation [4]. In early 1940, Nikolai Nilovich appealed to the Higher Attestation Commission (HAC) with a request to award L.I. Smirnov the title of Doctor of Medical Sciences without defending his dissertation, as a leading scientist in the field of pathological anatomy of the nervous system, having diverse scientific, pedagogical, and production achievements.

In December 1940, the HAC awarded Leonid Iosifovich Smirnov a doctorate degree, and two months later in 1941, approved him with the academic title of "Professor" in the specialty "Morphology".

In 1940, L.I. Smirnov — a voluntary participant in the war with Finland and from 1941 to 1944 in the Great Patriotic War (GPW) with Nazi Germany on the South-Western and Stalingrad fronts in evacuation hospital No. 2386 with the rank of lieutenant colonel of the medical service (Fig. 8)[1]. It should be noted that during the GPW, L.I. Smirnov initiated a series of fundamental studies on the problem of brain injury. These studies, based on the combined principles of etiology, pathological anatomy, pathophysiological mechanisms of development, outcomes, and complications of traumatic brain injury, later led to the development of the doctrine of traumatic brain disease, which significantly influenced the treatment of

[1] Leonid Iosifovich Smirnov: Memory of the People. URL: https://pamyat-naroda.ru/heroes/person-hero91472389/?ysclid=miasyfsrmg432420181 (accessed: 11/23/2025).



Fig. 8. **Smirnov Leonid Iosifovich — voluntary participant of the Great Patriotic War (1941–1945). URL: https://pamyat-naroda.ru/heroes/person-hero91472389/ (accessed: 11/05/2025)**

head wounds. After demobilization, the scientist returned to his position at the Institute of Neurosurgery[1].

Leonid Iosifovich's scientific interests throughout his creative career were the study of issues of central nervous system pathology.

L.I. Smirnov was distinguished by his selfless love for his profession and science, talent, goodwill, nobility, and had a broad erudition in morphology and related sciences, which was facilitated by his knowledge of German, French and English, and to a lesser extent Italian and Spanish; he was completely devoid of any squeamishness (he carried a saucepan of porridge and brains preserved in formalin, wrapped in a rag and newspaper, in a single string bag), indifferent to his appearance, hairstyle, beard, and extremely careless in his clothes. A man of science, he did not confine himself to his profession and remained a lifelong admirer of the Maly Theatre, especially the plays of A.N. Ostrovsky, he read classics at home, preferred Leskov. He enjoyed singing folk songs with his colleagues and was a keen fisherman. His dedication and passion for his work were contagious and uniting to all his staff [5, 6].

In 1940, Leonid Iosifovich was a member of the All-Union Communist Party (Bolsheviks), and in 1944–1947 — a member of the party bureau, secretary of the party organization of the CNHI, and then a member of the plenum of the Sverdlovsk District Party Committee in Moscow [7].

In 1944, as part of a delegation of prominent scientists, he carried out the exhumation of victims of the occupation of Nazi Germany.

In 1945, Nikolai Nilovich appointed L.I. Smirnov as his deputy for scientific and theoretical work of the CNHI. Soon, the USSR Academy of Medical Sciences (AMS) and the USSR People's Commissariat of Health approved Leonid Iosifovich as the first deputy director of the CNHI. After the death of N.N. Burdenko in 1946, L.I. Smirnov served as acting director of the institute for several months. As early as May 1946, N.N. Burdenko, seeing the outstanding scientific achievements of L.I. Smirnov, nominated him for full membership in the USSR AMS, established in 1944, emphasizing: "We have no equal to him specialist in pathological anatomy in the Union, no equal to him researcher of the pathological process abroad," and in the same year, Professor L.I. Smirnov was elected a corresponding member of the USSR AMS[2, 3].

L.I. Smirnov's main scientific and pedagogical activities were related to issues in the field of neurophysiology, the morphology of mental illnesses, including schizophrenia, studied issues in the field of topography, histogenesis, and histology of the meninges, as well as tumors of the brain and spinal cord. Under the leadership of L.I. Smirnov, fundamental research into the problems of brain injury was developed, where the natural sequence of development of pathological processes in the brain after traumatic brain injury was demonstrated for the first time.

The Morphology Department, in which L.I. Smirnov worked passionately, was a unique institute center, where young and old staff, morphologists sent from all over the country, and even guests from abroad, were constantly clarifying things. Leonid Iosifovich never refused to help anyone and traditionally served as the head of the morphological sections of all dissertations. Incidentally, Nikolai Nilovich, as well as the institute's leading neurosurgeons and neurologists, eagerly analyzed all the sectional cases with Leonid Iosifovich, concentrating on analyzing errors and observational features. This was an extremely useful discussion, in which everyone together enriched neuromorphology with first-class researches. At the same time, for the first time, regularly alternating periods during traumatic brain disease were identified [8, 9].

The main thing that characterizes the pathomorphological picture after craniocerebral trauma at any period of the disease development and in each individual case, according to the conclusion of L.I. Smirnov, is: a) the state of the foci of traumatic crushing, in other words, the stage of healing of the primary damage to the brain tissue caused by the direct impact of mechanical energy;

[1] Uranova N.A. Smirnov Leonid Iosifovich (1889–1955). URL: https://m.ncpz.ru/sotr/57.php (accessed: 10/07/2025).

[2] Kursk Encyclopedia. Compiled by Sh.R. Goizman. 2025. URL: https://www.mke.su/wide.html (accessed: 11/05/2025).

[3] Baibakov Yu.I. Smirnov Leonid Iosifovich. URL: https://www.mke.su/doc/SMIRNOV%20LI.html (accessed: 11/05/2025).

b) the state of circulatory mechanisms (hemodynamics and cerebrospinal fluiddynamics and the presence of consequences of their disorders); c) the absence or presence of complications and their nature. Based on this, Leonid Iosifovich identified the following five periods in the development of pathological processes.

1. Initial — the period of direct pathogenic action of mechanical energy with the phenomena directly caused by it, with passivity of tissue elements or, more precisely, the rudimentary expression of tissue and cellular reactions at the site of direct application of the traumatic agent, with maximum expression of functional disorders, circulatory mechanisms and in the absence of complications.

2. Early — the period of tissue reactions, characterized by the processes of cleansing the tissue defect from the decay products of brain tissue and blood, the development of reactive, non-purulent inflammation at a distance, lability of circulatory mechanisms and early complications.

3. Intermediate — the period of developing scar formation and later complications.

4. Late — the period of ending scar formation and complete elimination of complications of the early and intermediate (intermediate) periods.

5. Residual state — the period of the formed scar. The duration of each of these periods varies in different cases and is determined by many factors. Of these, the vastness of tissue damage, depending on the intensity of the traumatic agent, and the nature of complications that occur during the course of the disease (bacteriological factor) are in the first place. Of no small importance in this regard are the individual characteristics of the organism, the mechanism of action of the traumatic agent, the type and kinetic energy of the wounding projectile at the moment of its application, the topography of the lesion, the nature of the damage to the bones of the skull and their condition [10].

L.I. Smirnov's research in the field of the central nervous system tumors was distinguished by its focus on general pathological processes, the depth of its generalizations, combined with the brilliance of its morphological analysis.

He developed an original classification of neuroectodermal and meningeal tumors, taking into account their clinical and surgical significance. The scientist deeply and convincingly studied such tumor factors as topic, interaction of parenchyma and stroma, differentiation, cataplasia, metastasis, etc. L.I. Smirnov confirmed his histogenetic conclusions using the tissue culture method. He developed the theory of diffuse tumors of the central nervous system and identified previously unknown and clinically important forms of purulent complications.

L.I. Smirnov made many new contributions to the study of the pathomorphology of schizophrenia, developing the concept of organic and functional unity and interaction of processes in neurons, glia, and blood vessels, and emphasizing the importance of identifying histopathological syndromes in schizophrenia.

L.I. Smirnov has written more than 80 scientific publications, including 6 monographs that laid the foundation for neurophysiology and in which, in particular, epidemic diseases of the nervous system, the basics of morphology of the nervous system in normal and pathological conditions, the pathological anatomy and pathogenesis of traumatic diseases of the nervous system, as well as the topography, histology and histogenesis of brain tumors are highlighted. and the spinal cord and meninges, which have gained worldwide fame.

L.I. Smirnov was noted the following awards: He was awarded the Order of the Red Star, the Medal "For the Defense of Stalingrad" and a number of other high awards [11].

Professor Smirnov's research results are classic and have not yet lost their exceptional relevance and significance, while Leonid Iosifovich's monographs and printed works have not lost their significance to this day and are the reference books for neuromorphologists and pathologists in our country.

The remarkable modesty and extraordinary work ethic of this unique scientist, who made significant contributions to medicine, will serve as an example for the younger generation of scientists.

L.I. Smirnov died on January 8, 1955 in Moscow at the age of 66. He was buried at the ancestral site of the Donskoy cemetery in Moscow (Fig. 9) [12].



Fig. 9. **The tombstone monument to Leonid Iosifovich Smirnov at the ancestral site of the Donskoy cemetery in Moscow. Photo by Evgeny Danilov**

LIST OF L.I. SMIRNOV'S MAIN SCIENTIFIC WORKS IN CHRONOLOGICAL SEQUENCE

1. Epidemic diseases of the nervous system in 1919–1921. Kursk: Kursk Gubzdrav; 1923. (In Russ.).
2. Typhus and the nervous system. Kursk: Izdanie Kurskogo gubzdravotdela; 1923. Part 1. 222 p. (In Russ.).
3. Fundamentals of the morphology of the nervous system in normal and pathological states. Vol. 1. General normal and pathological histology: glia and mesoderm. Kharkov: Gosmedizdat of the Ukrainian SSR; 1935. 360 p. (In Russ.).
4. Pathological Anatomy and Pathogenesis of Traumatic Diseases of the Nervous System. Part 1. General Pathological Anatomy of Traumatic Disease of the Brain, Concussion. 1947. 135 p.; Part 2. Specific Pathological Anatomy of Traumatic Disease of the Brain Uncomplicated by Infection: an atlas of 63 tables is included with the book. 1949. 266 p. Moscow: Publishing House of the USSR Academy of Medical Sciences, Voroshilov Central Printing House; 1947–1949. (In Russ.).
5. On the question of multiforme spongioblastomas. *Journal of Neuropathology and Psychiatry*. 1956;56(3):201–210 (In Russ.).
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ПЕРЕЧЕНЬ ОСНОВНЫХ НАУЧНЫХ РАБОТ Л.И. СМИРНОВА В ХРОНОЛОГИЧЕСКОЙ ПОСЛЕДОВАТЕЛЬНОСТИ

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