



**Svetlana Demyanenko**

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Main research interests:

**signaling pathways, epigenetic regulation, neurobiology, brain injury, neurodegenerative diseases, neuroprotection**

Date of birth: 28/12/1973/Nationality: Russian

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#### **EDUCATION:**

- 14.10.2021 D.Sc. (Biosciences, with a major Biochemistry and Pathological physiology) Pirogov Russian National Research Medical University (Moscow, Russia). Title: "Signal and epigenetic processes of brain damage and protection after ischemic stroke".
- 09.2000-07.2003 Ph.D. (Biosciences, with a major Biochemistry) Rostov State University (Russia). Title: "Effect of nootropic drug GVS-111 on free radical processes in the brain and blood of rats of different anxiety level".
- 09.1991-06.1996 Specialist degree (Biologist, with a major Biochemistry), Rostov State University (Russia). Thesis: "Effect of the delta-sleep inducing peptide and piracetam on the balance neurotransmitter amino acids by the action of hyperbaric oxygen".

#### **PROFESSIONAL APPOINTMENTS:**

- 2012-Present Leading researcher, Head of the Laboratory "Molecular Neurobiology", Academy of biology and biotechnology, Southern Federal University (Rostov-on-Don, Russia) (early positions: Senior Researcher)
- 2022-Present Associate professor, Department of General and Clinical Biochemistry no.2, Rostov State Medical University (Rostov-on-Don, Russia)
- Oct.2014-Dec.2014 Visiting Scientist, Institute for Cancer Research (Oslo, Norway)  
Oct.2012-Nov.2012 Visiting Scientist, Institute for Cancer Research (Oslo, Norway)
- 2011-2012 Head of the Department of Biochemistry at Rostov State Medical University (Rostov-on-Don, Russia)
- 2002-2011 Research fellow, Laboratory of Biochemistry of Microorganisms, Rostov-on-Don Institute for Plague Control of the Federal Agency on Consumer Rights Protection & Human Welfare Supervision (Rostov-on-Don, Russia)
- 2000-2002 Laboratory assistant, Department of Department of Microbiology and Virology no.2, Rostov State Medical University (Rostov-on-Don, Russia)
- 1996-2000 Computer graphics designer, Remiko LLC, Fortex LLC, Freelance (Rostov-on-Don, Russia)
- 1994-1996 Preparator, Rostov Research Institute of Microbiology and Parasitology (Rostov-on-Don, Russia)

#### **RESEARCH SKILLS**

Proteomic analysis; fluorescence and confocal microscopy, immunohistochemistry, Duolink PLA, apoptosis assay, including preparation of tissue sections; dot blot, western blot, immunoprecipitation, co-immunoprecipitation, including isolation of subcellular fractions; linked immunosorbent assay; low- and medium-pressure

chromatography; high performance liquid chromatography, flow cytometry, RNA isolation, cDNA synthesis, quantitative real-time PCR; cell culturing, including primary neuronal culture; bacteria cultivation and isolation, including pathogenic; animal behavior/surgeries (mice, rats), data analysis using Statistica, SigmaPlot, Prism, R.

#### **ADDITIONAL SKILLS**

English: B1 (Intermediate); Chinese: A1 (Beginner); graphic editors: Corel Draw, Corel Xara, Corel PaintPhop, Adobe Illustrator, Adobe Photoshop etc.

#### **PRIZES AND AWARDS**

- Excellence Certificate of the **Southern Federal University** for fruitful work in higher education (2015)
- Gratitude of the Southern Federal University for the promotion and popularization of the university's priority projects (2021)

#### **SUPERVISING AND MENTORING ACTIVITIES**

- 2023 academic year: «Functional biochemistry of nerve cells» Master Program in the direction «Biology» - Academy of Biology and Biotechnology, Southern Federal University (SFEDU) - 180 academic hours - Russian.
- 2022 and 2023 academic year: «Clinical Biochemistry» Bachelor Program in the direction «General Medicine» - Rostov State Medical University - 1 and 2 courses - 360 academic hours - Russian/English.
- 2020 academic year: «Biological Chemistry» Bachelor Program in the direction «Pedagogical education» - SFEDU - 108 academic hours - Russian.
- 2004 academic year: «Statistical analysis in biology» Bachelor Program in the direction «Pedagogical education» - Rostov State Pedagogical University - 108 academic hours - Russian.
- 2001 academic year: «Physiology of children and adolescents» Master Program in the direction «Pedagogical education» - Rostov State Pedagogical University - 108 academic hours - Russian.
- PhD student 5 project management.
- One Ph.D. students received Ph.D. degrees.
- Master's 2 project management
- Bachelor's 6 project management

#### **PARTICIPATION IN SCIENTIFIC CONFERENCES IN 2022**

- November 23-25. V Society of Regenerative Medicine, Moscow, Russia, - Oral talk «Involvement of histone deacetylases in the regulation of p53 activity in the acute and early recovery periods after stroke»
- September 28-29. On-line International Workshop «Saratov Fall Meeting SFM'22», - Oral talk «E2F1 acetylation regulates apoptosis of perifocal region cells after photothrombotic stroke»
- September 26-29. 14-th World Stroke Congress 2022: New Frontiers in stroke care, Singapore & On-line, Posters « Expression and intracellular localization of  $\alpha$ -,  $\beta$ -, and  $\gamma$ -secretases, and the effect of their inhibitors in the peri-infarct zone in mice»; «Colocalization of p53 with histone deacetylases in the perifocal region 24 hours after photothrombotic stroke in rats»; «Localization of the C- and N-terminal fragments of APP in cell compartments on the first day after photothrombotic stroke»; «Intracellular localization and expression of c-myc, E2F1, and p53 in the perifocal region after ischemic stroke in rats»
- July 9-13. FENS Forum 2022, Paris, France & On-line, Poster «Evaluation of p53 expression and interaction with HDAC2 in the acute period after photothrombotic stroke in rats»
- April 28-29. IX International conference "Modern biotechnology for science and practice", StPetersburg, Russia, - Invited talk «Mechanisms of anti-apoptotic action of exogenous heat shock protein 70»

#### **PARTICIPATION AT SCIENTIFIC SCHOOLS**

- 2023, February, 9 – March, 11 (144 hours). Development of professional competencies of a higher educational institution teacher. Development of professional competencies of higher education teacher. Rostov State Medical University, Rostov-on-Don.
- 2022, April, 29 – October, 31 (72 hours). Intensive Chinese Course (Level A). Southern Federal University, Rostov-on-Don
- 2021, November, 21-26. Moscow School of Management SKOLKOVO (Advanced Training Courses) 2021 School of Research Program Management: Introduction, Moscow
- 2021, June, 5 – July, 09 International training program for decision-makers in science and international scientific cooperation JEMS – «JINR Expertise for Member States and Partner Countries», Joint Institute for Nuclear Research, Dubna
- 2021, April, 20 The Elements of Artificial Intelligence course, University of Helsinki, Reaktor, Helsinki, Finland

-2011, May, 10 – June, 3 (144 hours) Flow cytometry in clinical laboratory diagnostics, Pavlov First Saint Petersburg State Medical University; (Pavlov University), StPetersburg

-2002, August, 12 – November, 30 Specialization courses for doctors and biologists on especially dangerous infections, Institute for Plague Control of the Federal Agency on Consumer Rights Protection & Human Welfare Supervision, Rostov-on-Don

#### **PARTICIPATION IN INDUSTRIAL INNOVATION**

In 2015 to 2017, she provided consulting services to LLC «Rostov Scientific Research Institute of Biotechnology» as the head of the scientific direction of the company. In 2022 was the work manager of Biofullerene US LLC (Texas, USA) by selection of working concentration of the provided fullerene. Study of the effect of the working concentration of provided fullerene on the number of apoptotic glial cells and percent of necrotic glial cells and neurons in isolated neuroglial preparations of crayfish stretch receptors. In 2022 led the project of Steppe-Investments LLC (Rostov-on-Don, Russia) to determine the protein profile of Helianthus and Linum L. seeds.

#### **RESEARCH PROJECTS:**

2021-2023	Russian Science Foundation № 21-15-00188	"The role of post-translational acetylation and deacetylation of signaling proteins and transcription factors in ischemic penumbra after photothrombotic stroke"	Head of the Project
2021	Russian Ministry of Science and High Education № 13.2251.21.0080	"Neuroprotective activity of exogenous Hsp70 and drugs for the treatment of neurodegeneration"	Head of the Project
2020-2022	Russian Ministry of Science and High Education № 0852-2020-0028	"Biochemical and molecular-genetic studies of the mechanisms of pathological processes associated with socially significant diseases"	Head of the Project
2018-2020	Russian Science Foundation №18-15-00110	"Investigation of epigenetic and signal processes, regulating neurodegeneration and neuroprotection in the penumbra after photothrombotic stroke in the rat cerebral cortex"	Principal Researcher
2016-2018	Russian Foundation for Basic Research №16-04-01135-a	"The role of histone deacetylases in the postischemic recovery of the brain"	Head of the Project
2014-2017	Russian Science Foundation №14-15-00068	"Investigation of intracellular signaling processes controlling neurodegeneration and neuroprotection in the penumbra after a local photothrombotic infarction in the cerebral cortex"	Principal Researcher
2014-2017	Russian Foundation for Basic Research №14-04-00741-a	"Signal and epigenetic mechanisms of ischemic tolerance developing in the nervous tissue under photoinduced ischemia"	Principal Researcher
2013-2015	Norwegian Cancer Society and the Southeastern Norway Regional Health Authority № 5705376	"The role of UVA radiation in melanoma initiation, progression and metastasis"	Visit Researcher
2011-2014	Russian Foundation for Basic Research N. 11-04-01476-a	"Proteomic analysis of the regulation of gene expression and chromatin rearrangements in the nervous tissue under photo-oxidative damage"	Principal Researcher
2013	Ministry of Education and Science of the Russian Federation N 213.01-24 / 2013-38 (N 01201178795)	"Complex neurochemical, proteomic and ultrastructural study of cell-molecular mechanisms of neurodegeneration and neuroprotection in photo-induced stroke"	Researcher
2010-2012	Ministry of Education and Science of the Russian Federation №16.740.11.0368	"Epigenetic mechanisms of human melanoma formation"	Researcher
2011	Ministry of Education and Science of the Russian Federation N 01201178795	"Investigation of the regenerative activity of the carotenoid fraction of Deinococcus radiodurans in the model of a full-thickness cutaneous skin on the background of type I diabetes in mice"	Researcher
2010	Project "Practical use of Skulachev ions." LLC "Mitotechnology"	"Study of the effect of SkQ1 on the estradiol level in the serum of female reproductive-age rats"	Researcher

## Publication list

### Patent:

1. Method for stimulating nerve regeneration. **Demyanenko S.V.**, Evgen'ev MB., Garbuz D.G., Pitinova M.A. №2775886 от 22.12.2021

### Monograph:

1. **S.V. Demyanenko**. Modern concepts of the mechanisms of cancer initiation and development, Rostov-on Don, Southern Federal University Press. 2013, 69 pp. (in Russian).
2. A.B. Uzdensky, **S.V. Demyanenko**. Photothrombotic stroke. Biochemistry of penumbra. Rostov-on Don, Southern Federal University Press. 2016, 127 pp. (in Russian).
3. **S.V. Demyanenko**, V.A. Dzreyan, A.B. Uzdensky. Damage and protection epigenetic mechanisms of central and peripheral nervous systems cells». Rostov-on Don, Southern Federal University Press. 2022, 179 pp. (in Russian).

### Reviews

1. Li Y, Gu Z, Lin S, Chen L, Dzreyan V, Eid M, **Demyanenko S**, He B. Histone Deacetylases as Epigenetic Targets for Treating Parkinson's Disease. *Brain Sci.* 2022;12(5):672.
2. Dzreyan, B.A.; Khaitin, A.M.; **Demyanenko, S. V.** Disruption of Calcium Homeostasis and Following Changes in Calcium Signaling in Neurons and Glial Cells in Response to Photodynamic Treatment. *Biochem. (Moscow), Suppl. Ser. A Membr. Cell Biol.* 2022, 16, 217–223.
3. **Demyanenko S**, Dzreyan V, Sharifulina S. Histone Deacetylases and Their Isoform-Specific Inhibitors in Ischemic Stroke. *Biomedicines.* 2021; 9(10):1445.
4. **Demyanenko S**, Sharifulina S. The Role of Post-Translational Acetylation and Deacetylation of Signaling Proteins and Transcription Factors after Cerebral Ischemia: Facts and Hypotheses. *Int J Mol Sci.* 2021;22(15):7947.
5. Uzdensky AB, **Demyanenko S**. Histone acetylation and deacetylation in ischemic stroke. *Neural Regen Res.* 2021;16(8):1529-1530.
6. Rodkin, S. V., Dzreyan, V. A., Demyanenko, S. V., Uzdensky, A. B. (2021) The Role of p53-Dependent Signaling Pathways in Survival and Death of Neurons and Glial Cells after Peripheral Nerve Injury. *Biochem. (Moscow), Suppl. Ser. A Membr. Cell Biol.* 2021. 15, 334–347
7. Uzdensky A.B., **Demyanenko S.V.** Epigenetic Mechanisms of Ischemic Stroke. - *Biochemistry (Moscow), Supplement Series A: Membrane and Cell Biology*, 2019, Vol. 13, No. 4, pp. 289–300.
8. Uzdensky AB, **Demyanenko SV**, Bibov MY. Signal transduction in human cutaneous melanoma and target drugs. *Curr Cancer Drug Targets.* 2013;13(8):843-66.

### Experimental papers

1. Sharifulina S, Khaitin A, Guzenko V, Kalyuzhnaya Y, Dzreyan V, Logvinov A, Dobaeva N, Li Y, Chen L, He B, **Demyanenko S**. Expression of Amyloid Precursor Protein, Caveolin-1, Alpha-, Beta-, and Gamma-Secretases in Penumbra Cells after Photothrombotic Stroke

- and Evaluation of Neuroprotective Effect of Secretase and Caveolin-1 Inhibitors. *Biomedicines*. 2022;10(10):2655.
2. **Demyanenko SV**, Pitinova MA, Kalyuzhnaya YN, Khaitin AM, Batalshchikova SA, Dobaeva NM, Shevtsova YA, Goryunov KV, Plotnikov EY, Pashkevich SG, Sukhikh GT, Silachev DN. Human Multipotent Mesenchymal Stromal Cell-Derived Extracellular Vesicles Enhance Neuroregeneration in a Rat Model of Sciatic Nerve Crush Injury. *Int J Mol Sci*. 2022;23(15):8583.
  3. Dzreyan, V.; Eid, M.; Rodkin, S.; Pitinova, M.; **Demyanenko, S.** E2F1 Expression and Apoptosis Initiation in Crayfish and Rat Peripheral Neurons and Glial Cells after Axonal Injury. *Int. J. Mol. Sci.* 2022, 23, 4451.
  4. Eid, M., Dzreyan, V., and **Demyanenko, S.** Sirtuins 1 and 2 in the Acute Period After Photothrombotic Stroke: Expression, Localization and Involvement in Apoptosis. *Front Physiol*. 2022 Apr 27;13:782684.
  5. M. Pitinova, Y. Kalyuzhnaya, and **S. Demyanenko**, “Axotomy induce an increase in the expression of Pink1, Parkin and Cofilin in rat dorsal root ganglia,” in *Optical Technologies for Biology and Medicine*, E. A. Genina and V. V. Tuchin, Eds., p. 4, SPIE (2022)
  6. **Demyanenko SV**, Pitinova MA, Dzreyan VA, Kalyuzhnaya YN, Eid MA, Abramov AY, Evgen'ev MB, Garbuz DG. The Role of p53 Protein in the Realization of the Exogenous Heat Shock Protein 70 Anti-Apoptotic Effect during Axotomy. *Cells*. 2021;11(1):93.
  7. Sharifulina S, Dzreyan V, Guzenko V, **Demyanenko S.** Histone Methyltransferases SUV39H1 and G9a and DNA Methyltransferase DNMT1 in Penumbra Neurons and Astrocytes after Photothrombotic Stroke. *Int J Mol Sci*. 2021;22(22):12483.
  8. **Demyanenko S**, Nikul V, Rodkin S, Davletshin A, Evgen'ev MB, Garbuz DG. Exogenous recombinant Hsp70 mediates neuroprotection after photothrombotic stroke. *Cell Stress Chaperones*. 2021;26(1):103-114.
  9. **Demyanenko S.V.**, Uzdensky A.B., LIM kinase inhibitor T56-LIMKi protects mouse brain from photothrombotic stroke, *Brain Injury*, 2021. Mar 21;35(4):490-500.
  10. **Demyanenko SV**, Nikul VV, Uzdensky AB. The Neuroprotective Effect of the HDAC2/3 Inhibitor MI192 on the Penumbra After Photothrombotic Stroke in the Mouse Brain. *Mol Neurobiol*. 2020; 57(1):239-248.
  11. **Demyanenko SV**, Dzreyan VA, Uzdensky AB. Overexpression of HDAC6, but not HDAC3 and HDAC4 in the penumbra after photothrombotic stroke in the rat cerebral cortex and the neuroprotective effects of  $\alpha$ -phenyl tropolone, HPOB, and sodium valproate. *Brain Res Bull*. 2020;162:151-165.
  12. **Demyanenko SV**, Dzreyan VA, Uzdensky AB. The Expression and Localization of Histone Acetyltransferases HAT1 and PCAF in Neurons and Astrocytes of the Photothrombotic Stroke-Induced Penumbra in the Rat Brain Cortex. *Mol Neurobiol*. 2020 Jul;57(7):3219-3227.
  13. **Demyanenko S**, Gantsgorn E, Rodkin S, Sharifulina S. Localization and Expression of Sirtuins 1, 2, 6 and Plasticity-Related Proteins in the Recovery Period after a Photothrombotic Stroke in Mice. *J Stroke Cerebrovasc Dis*. 2020;29(10):105152.
  14. **Demyanenko S.V.**, Dzreyan V.A., Neginskaya M.A., Uzdensky A.B. Expression of Histone Deacetylases HDAC1 and HDAC2 and Their Role in Apoptosis in the Penumbra Induced by Photothrombotic Stroke. *Molecular Neurobiology*, 2020, 57:226–238
  15. **Demyanenko S**, Dzreyan V, Uzdensky A. Axotomy-Induced Changes of the Protein Profile in the Crayfish Ventral Cord Ganglia. *J Mol Neurosci*. 2019;68(4):667-678.
  16. **Demyanenko S**, Berezhnaya E, Neginskaya M, Rodkin S, Dzreyan V, Pitinova M. Class II histone deacetylases in the post-stroke recovery period-expression, cellular, and

- subcellular localization-promising targets for neuroprotection. *J Cell Biochem.* 2019;120(12):19590-19609.
17. **Demyanenko S.**, Uzdensky A. Epigenetic Alterations Induced by Photothrombotic Stroke in the Rat Cerebral Cortex: Deacetylation of Histone H3, Upregulation of Histone Deacetylases and Histone Acetyltransferases // *Int. J. Mol. Sci.* 20(12). 2019, 20, pii: E2882;
  18. **Demyanenko SV**, Uzdensky AB. The Focal-Focal Preconditioning Effect of Photothrombotic Impact on the Signaling Protein Profile in the Penumbra Surrounding the Ischemic Core Induced by Another Photothrombotic Impact. *Mol Neurobiol.* 2018;55(1):229-248.
  19. **Demyanenko S**, Neginskaya M, Berezhnaya E. Expression of Class I Histone Deacetylases in Ipsilateral and Contralateral Hemispheres after the Focal Photothrombotic Infarction in the Mouse Brain. *Transl Stroke Res.* 2018 Oct;9(5):471-483.
  20. **Demyanenko S**, Uzdensky A. Profiling of Signaling Proteins in Penumbra After Focal Photothrombotic Infarct in the Rat Brain Cortex. *Mol. Neurobiol.* 2017;54(9):6839-6856.
  21. Uzdensky A., **Demyanenko S.**, Fedorenko G., Lapteva T., Fedorenko A. Photothrombotic infarct in the rat brain cortex: Protein profile and morphological changes in penumbra *Molecular Neurobiology*, 2017, 54, 6, 4172–4188.
  22. **S. V. Demyanenko**, S. N. Panchenko, and A. B. Uzdensky. Expression of Neuronal and Signaling Proteins in Penumbra around a Photothrombotic Infarction Core in Rat Cerebral Cortex. *Biochemistry (Moscow)*, 2015, Vol. 80, No. 6, pp. 790-799.
  23. **Demyanenko SV**, Uzdensky AB, Sharifulina SA, Lapteva TO, Polyakova LP. PDT-induced epigenetic changes in the mouse cerebral cortex: a protein microarray study. *Biochim Biophys Acta.* 2014;1840(1):262-70.
  24. Uzdensky A, **Demyanenko S**, Bibov M, Sharifulina S, Kit O, Przhedetski Y, Pozdnyakova V. Expression of proteins involved in epigenetic regulation in human cutaneous melanoma and peritumoral skin. *Tumor Biology*: 35 (2014), 8225-8233.
  25. Neginskaya MA, Berezhnaya EV, Rudkovskii MV, **Demyanenko SV**, Uzdensky AB Photodynamic Effect of Radachlorin on Nerve and Glial Cells. *Photodiagnosis Photodyn Ther.* 2014, 11, 357-364.
  26. Mendzheritskiĭ A.M., Karantysh G.V., Ryzhak G.A., **Dem'ianenko S.V.** Regulation of content of cytokines in blood serum and of caspase-3 activity in brains of old rats in model of sharp hypoxic hypoxia with Cortexin and Pinealon. *Adv. Gerontol.* 2014; 27(1): pp. 94-97.
  27. Chistyakov VA, **Dem'yanenko SV**, Alexandrova AA, Gutnikova LV, Prokof'ev VN, Kosheleva ON. Effect of plastoquinone derivative 10-(6'-plastoquinonyl) decyltriphenylphosphonium (SkQ1) on estrous cycle and 17 $\beta$ -estradiol level in rats. *Biochemistry (Mosc).* 2012;77(12):1382-6.
  28. **S.V. Demyanenko**, V.A. Chistiakov, L.V. Romanova. Fisiological aspects of host-microorganisms interreaction: the role of neurotransmitter amines. 2012. *Usp. Fiziol. Nauk* 43. pp. 101-112 (in Russian).
  29. The role of the synaptic and mitochondrial pool of amino acids in the implementation of the behavioral effects of piracetam
  30. **S.V. Demyanenko**, B.N. Mishan'kin, L.V. Romanova Effect of serotonin and dopamine on growth of *Yersinia pestis* and *Francisella tularensis* strains. 2009. *Zh. Mikrobiol. Epidemiol. Immunobiol.* 2. pp. 93-96.