



Personal Information

Elena Nemtseva



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Current Positions

- Assistant Professor, the Biophysics Department, Institute of Fundamental Biology and Biotechnology, Siberian Federal University, Krasnoyarsk
- Researcher, Laboratory of Bioluminescent Biotechnologies, Siberian Federal University, Krasnoyarsk
- Senior Researcher, Research Department, Siberian Federal University, Krasnoyarsk

Research Interests

- Mechanisms of the bio- and chemi-luminescence: factors, determining the “color” and quantum yield of bioluminescent emitters
- Fluorescent spectroscopy of biological molecules including time-resolved fluorescence of proteins
- Enzymes functioning under native-like conditions: effects of osmolytes, macromolecular crowding and diffusional restriction
- Probing of proteins conformation changes with optical techniques, tryptophan as an intrinsic protein fluorophore

Education and Academic Degrees

- 2002 – Kandidatskaya degree (PhD) in Biophysics, Institute of Biophysics, Siberian Branch of Russian Academy of Sciences, Krasnoyarsk, Russia
- 1998 – Master of Science in Physics (MSc), Krasnoyarsk State University, Department of Physics, Krasnoyarsk, Russia
- 1997 – Diploma in Physics (Specialty: Biophysics), Krasnoyarsk State University, Department of Physics, Krasnoyarsk, Russia

Professional Career

- 2009– present – Researcher, Institute of Biophysics, Siberian Branch of Russian Academy of Sciences, Krasnoyarsk, Russia
- 2008– present – Assistant Professor, the Biophysics Department, Institute of Fundamental Biology and Biotechnology, Siberian Federal University, Krasnoyarsk, Russia
- 2003–2008 – Senior Teacher, Chair of Biophysics, Krasnoyarsk State University, Krasnoyarsk, Russia
- 2002–2003 – Technical assistant, Chair of Biophysics, Krasnoyarsk State University, Krasnoyarsk, Russia
- 1998–2001 – PhD student, Institute of Biophysics, Siberian Branch of Russian Academy of Sciences, Krasnoyarsk, Russia
- 1997–1998 – Laboratory assistant, Chair of Biophysics, Krasnoyarsk State University, Krasnoyarsk, Russia

Recent Publications

- 2021

Nemtseva, E. V., Gulnov, D. V., Gerasimova, M. A., Sukovatyi, L. A., Burakova, L. P., Karuzina, N. E., ... & Kratasyuk, V. A. (2021). Bacterial luciferases from *Vibrio harveyi* and *Photobacterium leiognathi* demonstrate different conformational stability as detected by time-resolved fluorescence spectroscopy. *International journal of molecular sciences*, 22(19), 10449. doi:10.3390/ijms221910449

Lisitsa, A. E., Sukovatyi, L. A., Bartsev, S. I., Deeva, A. A., Kratasyuk, V. A., & Nemtseva, E. V. (2021). Mechanisms of viscous media effects on elementary steps of bacterial bioluminescent reaction. *International journal of molecular sciences*, 22(16), 8827. doi:10.3390/ijms22168827

- 2020

Rozhko, T. V., Nemtseva, E. V., Gardt, M. V., Raikov, A. V., Lisitsa, A. E., Badun, G. A., & Kudryasheva, N. S. (2020). Enzymatic responses to low-intensity radiation of tritium. *International journal of molecular sciences*, 21(22), 8464. doi:10.3390/ijms21228464

Sukovatyi, L.A., Lisitsa, A.E., Kratasyuk, V.A. et al. (2020). The effect of osmolytes on the bioluminescent reaction of bacteria: structural and dynamic properties. *Biophysics* 65, 966–971. doi:10.1134/S0006350920060202

Lisitsa, A. E., Sukovatyi, L. A., Kratasyuk, V. A., & Nemtseva, E. V. (2020). Viscous media slow down the decay of the key intermediate in bacterial bioluminescent reaction. *Dokl Biochem Biophys* 492, 162–165. doi:10.1134/S1607672920020106

- 2019

Nemtseva, E. V., Gerasimova, M. A., Melnik, T. N., & Melnik, B. S. (2019). Experimental approach to study the effect of mutations on the protein folding pathway. *PloS one*, 14(1), e0210361. doi: 10.1371/journal.pone.0210361

Deeva AA, Zykova EA, Nemtseva EV, Kratasyuk VA. (2019). Functional divergence between evolutionary-related LuxG and Fre oxidoreductases of luminous bacteria. *Proteins* 87, 723–729. doi: 10.1002/prot.25696

• 2018

Bioluminescent biotests: current state and prospects. E.N. Esimbekova, V.A. Kratasyuk, E.V. Nemtseva [et al.] - Krasnoyarsk: Sib. Feder. University, 2018. – 256 p. ISBN 978-5-7638-3856-5

Nemtseva E., Lashchuk O, Gerasimova M., Nagibina G., Melnik T., Melnik, B. (2018). Fluorescence lifetime components reveal kinetic intermediate states upon equilibrium denaturation of carbonic anhydrase II. *Methods and Applications in Fluorescence*. 6 015006. doi: 10.1088/2050-6120/aa994a

Deeva A. A., Nemtseva E. V., Kratasyuk V. A. (2018). The role of electrostatic interactions in complex formation between bacterial luciferase and NADPH: FMN-oxidoreductase. *Journal of Siberian Federal University. Biology*. 11(1), 16-29. doi: 10.17516/1997-1389-0033

Gulnov D.V., Nemtseva E.V., Gerasimova M.A., Kratasyuk V.A. (2018). Structural transitions of *Photobacterium leiognathi* luciferase determined by various optical techniques under urea-induced equilibrium denaturation. *Tsitologia* 60 (10), 847–850. doi: 10.7868/S0041377118100181

Conferences

- 2021 – IX Congress of the Russian Society for Photobiology
- 2020 – I Russian Conference “Yenisei Photonics”
- 2019 – XII International Conference “Biocatalysis. Fundamentals & Applications”, VI Russian Congress on Biophysics
- 2018 – International Symposium on Bio- and Chemi-luminescence
- 2017 – Joint Life Science Forum: XII International Scientific Conference on Bioorganic Chemistry devoted to the Memory of Professor Yuri Ovchinnikov and VIII Russian Symposium "Proteins and Peptides", VIII Congress of the Russian Society for Photobiology

Patents

- RU Patent 2734621C1 “Enzymatic method of assessing integral toxicity of air”, October 21, 2020.

Grants

Project leader in:

- RFBR, 20-34-90118 "Structural and dynamic mechanisms of media influence on enzymes: the case of bacterial luciferase", 2020-2022

Principal participant in:

- State order of the Ministry of Education and Science of RF for Siberian Federal University, FSRZ-2020-0006 "Biologically active substances in ecological, biotechnological and medical systems", 2020-2022
- State order of the Ministry of Education and Science of RF for Siberian Federal University, 6.7734.2017 "The role of macromolecular crowding in the regulation of the efficiency of enzymes coupling in metabolic pathways of luminous bacteria", 2017-2019
- State order of the Ministry of Education and Science of RF for Siberian Federal University, 1762 "Experimental modeling of a bacterial cell: reconstruction of metabolic processes in hyaloplasm", 2014-2016

Participant in:

- RFBR, 19-04-00420 "A new approach to studying the folding pathway of globular proteins: investigation of denaturation/renaturation of bovine carboxyanhydrase b and its mutant forms by high resolution spectroscopy", 2019-2021
- RScF, 16-14-10115 "New approach in complex express evaluation of quality and contamination of soil based on bioluminescent enzymatic systems", 2016-2018
- RFBR, 18-44-242002 r_mk "Fluorescent protein as a fundamentally new biosensor for toxicity monitoring", 2018-2019
- RFBR, 16-44-242126 r_ofi_m "Development of scientific principles of a new and rapid bioassay biotechnology to control food safety and quality of fruits and vegetables", 2017-2018

Memberships

- International Society for Bioluminescence and Chemiluminescence (member)
- Russian Society for Photobiology (member)

Upskilling

- 2020 – Program “Scientific project: idea, funding, publication”, Siberian Federal University, Krasnoyarsk, Russia
- 2019 – Program “Participation in scientific discussions in English (B2 / C1), Siberian Federal University, Krasnoyarsk, Russia
- 2018 – Program “Current issues of immunogenetics”, Siberian Federal University, Krasnoyarsk, Russia
- 2017 – Program “Current issues of proteomics”, Siberian Federal University, Krasnoyarsk, Russia