ELENA V. ZAGAYNOVA
DSc in Medicine, professor of the
Russian Academy of Sciences
Phone: +7(831)4655626
e-mail: ezagaynova@gmail.com

SUMMARY

Elena V. Zagaynova received her PhD in 2000, her Dr. of Sciences in 2007. From 1998 her research interest has been the development of OCT as a method of visualization. She is the author of more than 80 research publications on OCT which are pioneering works on the interpretation of OCT images and the evaluation of clinical possibilities of OCT in endoscopy, oncology, and urology. She is an internationally recognized expert in the field of Optical Coherence Tomography medical applications and is most experienced medical professional in the use of OCT device, invented at the Institute of Applied Physics in Nizhny Novgorod. She is the author of the some chapters in the international handbooks: "Optical coherence tomography" (in Russian, 2005) and "Optical coherence tomography" (in English, 2007). She is also the author of 16 patents of Russian Federation and of their 2 international analogues. She has been the participant of joint research between the Institute of Applied Physics, Nizhny Novgorod State Medical Academy and the Cleveland Clinic (Ohio, USA), George Washington Clinic (Washington, USA) in the areas of OCT implementation in gastroenterology, urology. Now she is a director of Institute of Biomedical technologies in the Nizhny Novgorod State Medical Academy and Head of biomedical department Nizhny Novgorod State University.

RESEARCH INTERESTS

Now her research interests involve the development of new methods of cancer diagnosis and treatment, interactions of nanoparticles with leaving organisms, stem cells research, regenerative medicine. She was a head of more then 20 grants from Russian Federal Agency of science and innovations, Russian foundation of basic research, Russian scientific foundation and now she is a PI of scientific research projects implemented under the supervision of leading scientists (Lukianov S.A., Vitkin Alex) at Russian institutions of higher education.

SELECTED PUBLICATIONS

1. Endoscopic applications of optical coherence tomography / F.I. Feldchtein, G.V. Gelikonov, V.M. Gelikonov, R.V. Kuranov, A.M. Sergeev, N.D. Gladkova, A.V. Shakhov, N.M. Shakhova, L.B. Snopova, A.B. Terent'eva, **E.V. Zagainova,** Y.P. Chumakov, I.A. Kuznetsova // Optics Express. – 1998.–V.3(6). – P.257–69.
2. Optical coherence tomography (OCT) characterization of Barrett's esophagus (BE) / G. Zuccaro, N. Gladkova, J. Vargo, F. Feldchtein, E. **Zagaynova,** D. Conwell, G. Fallk, J. Goldblum, J. Ponsky, G. Gelikonov, J. Richter // American Journal of gastroenterology. – 2001. – V.95 (9). – P. 2443–2444.
3. Optical coherence tomography of the esophagus and proximal stomach in health and disease / G. Zuccaro, N. Gladkova, J. Vargo, F. Feldchtein, **E. Zagaynova,** D**.** Conwell, G. Falk, J. Goldblum, J. Dumot, J.Ponsky, G. Gelikonov, B. Davros, E. Donchenko, J.Richter // American Journal of gastroenterology. – 2001. – V. 96. – P. 2633–2639.
4. *In vivo* Optical Coherence Tomography feasibility for bladder disease / **E.V**. **Zagaynova,** N.D. Gladkova, O.S. Streltsova, L.B. Snopova, G.V. Gelikonov, F.I. Feldchtein, A.N. Morozov // J Urology. – 2002. – V.167. – P.1492–1496.
5. Optical Coherence tomography Physical Principles and applications / V.M. Gelikonov, G.V. Gelikonov, L.S. Dolin, V.A. Kamensky, A.M. Sergeev, N.M. Shakhova, **E.V. Zagaynova** // Laser Physics. – 2003. – P.692–702.
6. Complementary use of cross polarization and standard OCT for differential diagnosis of pathological tissues / R.V. Kuranov, V.V. Sapozhnikova, I.V. Turchin, **E.V. Zagainova**, V.M. Gelikonov, V.A. Kamensky, L.B. Snopova, N.N. Prodanetz // Optics Express. – 2002. – V.10 (15). – P.707–713.
7. Compact optical coherence microscope / V.M. Gelikonov, G.V. Gelikonov, S.U. Ksenofontov, A.N. Morosov, A.V. Maykov, Y.P. Potapov, V.V. Sapozhnikova, N.M. Shakhova, **E.V. Zagaynova** // Handbook of Coherent Domain Optical Methods. – Kluwer Academic Publishers, 2004. – P. 345–363.
8. Optical coherence tomography guided transuretral bladder cancer resection / **E. Zagaynova**, O. Streltsova, N. Gladkova, V. Kamensky, F. Feldshtein // Journal of endourology. – 2005. – Vol 19, Suppl 1. – P. A245.
9. Evaluation of superficial Bladder Transitional–Cell Carcinoma by Optical Coherence tomography / M. Manyak, N. Gladkova, J MakkarI, A. Shwartz, **E Zagaynova**, E Zolfaghari, J. Zara, F. Feldchtein, R. Iksanov // Journal of endourology. – 2005. – V.19. – P. 570–574.
10. E V Zagaynova, M V Shirmanova, M Yu Kirillin, B N Khlebtsov, A G Orlova, I V Balalaeva, M A Sirotkina, M L Bugrova, P D Agrba and V A Kamensky Contrasting properties of gold nanoparticles for optical coherence tomography: phantom, *in vivo* studies and Monte Carlo simulation // Phys. Med. Biol. 53 (2008) 4995–5009
11. Endoscopic OCT with forward-looking probe: clinical studies in urology and gastroenterology. Journal of Biophotonics № 2, 2008. E. Zagaynova, N Gladkova, N. Shakhova, G. Gelikonov, V. Gelikonov.
12. **Handbook of Biophotonics. *Chapter 15.* Fiber Based OCT: From Optical Design to Clinical Applications** Valentin Gelikonov, Grigory Gelikonov, Mikhail Kirillin, Natalia Shakhova, Alexander Sergeev, Natalia Gladkova, Elena Zagainova Volum 2: Photonics for Health Care PART III – Optical clinical technologies and systems / Ed. V. Tuchin. Springer. 2009
13. Zagaynova EV, Gladkova ND, Streltsova OS, Gelikonov GV, Tresser N, Feldchtein FI, et al. Optical Coherence Tomography in Urology. Optical Coherence Tomography. Berlin Heidelberg: Springer 2008. p. 1241-68.

14. Contrasting properties of gold nanoshells and titanium dioxide nanoparticles for OCT imaging of skin: Monte Carlo simulations and in vivo study Mikhail Kirillin, Marina Shirmanova, Marina Sirotkina, Marina Bugrova, Boris Khlebtsov, Elena Zagaynova. Journal Biomedical Optics.14 (2) March/April 2009. P 021017-1-11.
15. M.A. Sirotkina, V.V. Elagin, M.V. Shirmanova, M.L. Bugrova, L. B. Snopova, V. A. Kamensky, V. A. Nadtochenko, N. N. Denisov, and E. V. Zagaynova OCT-guided laser hyperthermia with passively tumor-targeted gold nanoparticles // Jornal of Biophotonics, 2010, Vol.3, 10-11, P.718-727
16. Shirmanova M, Zagaynova E, Sirotkina M, Snopova L, Balalaeva I, Krutova I, Lekanova N, Turchin I, Orlova A, Kleshnin M, "In vivo study of photosensitizers pharmacokinetics by fluorescence transillumination imaging", // J. Biomed. Opt., Vol. 15 (2), 048004-1-8 (2010)
17. M. A. Sirotkina, M. V. Shirmanova, M. L. Bugrova, V. V. Elagin, P. A. Agrba, M. Yu. Kirillin, V. A. Kamensky, E. V. Zagaynova Continuous optical coherence tomography monitoring of nanoparticles accumulation in biological tissues // J Nanopart Res, Volume 13, Issue 1 (2011), P 283-291
18. Larisa G. Klapshina, William E. Douglas, Ilya S. Grigoryev, Elena Yu Ladilina, Marina V. Shirmanova, Sergey A. Mysyagin, Irina V. Balalaeva and Elena V. Zagaynova Novel PEG-organized biocompatible fluorescent nanoparticles doped with an ytterbium cyanoporphyrazine complex for biophotonic applications // Chem. Commun., 2010, 46 (44), 8398-8400
19. Natalia Gladkova; Olga Streltsova, Elena Zagaynova, Elena Kiseleva, Valentin Gelikonov, Grigory Gelikonov, Maria Karabut, Katerina Yunusova, Olga Evdokimova. Cross-polarization optical coherence tomography for early bladder-cancer detection: statistical study. J. Biophotonics 4, No. 7–8, 519–532 (2011)
20. Light-induced blockage of cell division with a chromatin-targeted phototoxic fluorescent protein. E.O. SEREBROVSKAYA, T. V. GORODNICHEVA, G. V. ERMAKOVA, E.A. SOLOVIEVA, G. V. SHARONOV, E.V. ZAGAYNOVA, D.M. CHUDAKOV, S. LUKYANOV, A. G. ZARAISKY, K. A. LUKYANOV, Biochem. J. (2011) 435, 65–71.
21. E. V. Zagaynova, N. D.Gladkova, N. M.Shakhova, O.S.Streltsova., I.A.Kuznetsova, I.A. Yanvareva, L.B.Snopova, E.E.Yunusova, E.B.Kiseleva, G. Gelikonov, V. Gelikonov and A.M.Sergeev.**Chapter 24**. Optical Coherence Tomography Monitoring of Surgery in Oncology. *Handbook of Biophotonics*. Volume 2. Photonics for Health Care. First Edition. Edited by J. Popp, V. Tuchin, A. Chiou and S.H. Heinemann. Published by Wiley-VCH., 2012, p. 337-376.
22. N.M.Mishina, I.Bogeski, D.A.Bolotin, M.Hoth, B.A.Niemeyer, C.Schuts, E.V.Zagaynova, S.Lukyanov, V.V.Belousov Can we see PIP3 and hydrogen peroxide with single probe? Antioxidants and Redox Signaling. 2012, Vol. 17, No. 3: 505-512. (**IF** 7.189)
23. Loginova YF, Kazachkina NI, Zherdeva VV, Rusanov AL, Shirmanova MV, Zagaynova EV, Sergeeva EA, Dezhurov SV, Wakstein MS, Savitsky AP. Biodistribution of intact fluorescent CdSe/CdS/ZnS quantum dots coated by mercaptopropionic acid after intravenous injection into mice.// J Biophotonics. 2012 Nov;5(11-12):848-59
24. **Gladkova N.,** Kiseleva E., Streltsova O., Prodanets N., Snopova L., Karabut M., Gubarkova E., Zagaynova E. Combined use of fluorescence cystoscopy and cross-polarization OCT for diagnosis of bladder cancer and correlation with immunohistochemical markers (2013) Journal of Biophotonics 6 (9) PP. 687 - 698 Cited 1 times. doi: 10.1002/jbio.201200105.
25. Imaging H2O2 microdomains in receptor tyrosine kinases signaling. Methods in Enzymology. – 2013. – Vol. 526. – P. 175-187. Mishina NM, Markvicheva KN, Fradkov AF, Schultz C, Zagaynova E, Lukyanov S, Belousov VV**.**
26. Alina P. Ryumina, Ekaterina O. Serebrovskaya, Marina V. Shirmanova, Ludmila B. Snopova, Maria M. Kuznetsova, Ilya V. Turchin, Nadezhda I. Evteeva, Natalia Klementieva, Arkady F.

Fradkov, Elena V. Zagaynova, Konstantin A. Lukyanov, Sergey A. Lukyanov. Flavoprotein miniSOG as a genetically encoded photosensitizer for cancer cells // BBA - General Subjects, 2013 Volume 1830, Issue 11, November 2013, Pages 5059–5067 (IF 4.204)

27. Marina V. Shirmanova, Ekaterina O. Serebrovskaya, Konstantin A. Lukyanov, Ludmila B. Snopova, Marina A. Sirotkina, Natalia N. Prodanetz, Marina L. Bugrova, Ekaterina A. Minakova, Ilya V. Turchin, Vladislav A. Kamensky, Sergey A. Lukyanov, and Elena V. Zagaynova. Phototoxic effects of fluorescent protein KillerRed on tumor cells in mice. J Biophotonics. 2013 Mar; 6(3):283-90. (IF 3.099)
28. Grigory V. Gelikonov, Valentin M. Gelikonov, Sergey U. Ksenofontov, Andrey N. Morosov, Alexey V. Myakov, Yury P. Potapov, Veronika V. Saposhnikova, Ekaterina A. Sergeeva, Dmitry V. Shabanov, Natalia M. Shakhova, and Elena V. Zagainova. **Chapter 20.** Compact Optical Coherence Microscope. 2013, In: Handbook of Coherent- Domain Optical Methods: Biomedical Diagnostics, Environmental Monitoring, and Materials Science, 2ed. Edited by Valery V. Tuchin. 1127-1156. ISBN: 978-1-4614-5175-4. Springer-Verla, N.Y.
29. E.O. Serebrovskaya, A.P. Ryumina, M.E. Boulina, M.V. Shirmanova, E.V. Zagaynova, E.A. Bogdanova, S.A. Lukyanov, K.A. Lukyanov. Phototoxic effects of lysosome-associated genetically encoded photosensitizer killer red. Journal of Biomedical Optics. 2014. 19(7): 071403 doi: 10.1117/1.JBO.19.7.071403.
30. Shirmanova MV, Gavrina AI, Aksenova NA, Glagolev NN, Solovieva AB, Shakhov BE, Zagaynova EV. (2014) Comparative Study of Tissue Distribution of Chlorin e6 Complexes with Amphiphilic Polymers in Mice with Cervical Carcinoma. J Anal Bioanal Tech S1:008. doi: 10.4172/2155-9872.S1-008
31. V. V. Elagin, E. A. Sergeeva, M.L. Bugrova, N. I. Ignatova, D. V. Yuzhakov, N. N. Denisov, V. A. Nadtochenko, E. V. Zagaynova. Selection of stabilizing agents to provide effective penetration of gold nanoparticles into cells. Photon Lasers Med 2014.3(4): 351–362
32. A.V. Meleshina, E.I. Cherkasova, M.V. Shirmanova, N.V. Klementieva, E.V. Kiseleva, L.B. Snopova, N.N. Prodanets, E.V. Zagaynova. Influence of mesenchymal stem cells on the metastases development in mice in vivo. Stem Cell Research & Therapy, 2015, 6:15. doi:10.1186/s13287-015-0003-7
33. Kuznetsova DS, Shirmanova MV, Dudenkova VV, Subochev PV, Turchin IV, Zagaynova EV, Lukyanov SA, Shakhov BE, Kamensky VA. Photobleaching and phototoxicity of KillerRed in tumor spheroids induced by continuous wave and pulsed laser illumination. J Biophotonics. 2015. Feb 3; 9999(9999). doi: 10.1002/jbio.201400130
34. Kiseleva E, Kirillin M, Feldchtein F, Vitkin A, Sergeeva E, Zagaynova E, Streltzova O, Shakhov B, Gubarkova E, Gladkova N. Differential diagnosis of human bladder mucosa pathologies in vivo with cross-polarization optical coherence tomography. Biomed Opt Express. 2015 Mar 24;6(4):1464-76. doi: 10.1364/BOE.6.001464
35. Sirotkina M.A., Buyanova N.L., Kalganova T.I., Karabut M.M., Elagin V.V., Kuznetsov S.S., Snopova L.B., Gelikonov G.V., Zaitsev V.Yu., Matveev L.A., Zagaynova E.V., Vitkin A., Gladkova N.D. Development of the Methodology of Monitoring Experimental Tumors Using Multimodal Optical Coherence Tomography: the Choice of an Optimal Tumor Model. CTM 2015;7(2):6-13
36. Shirmanova MV, Druzhkova IN, Lukina MM, Matlashov ME, Belousov VV, Snopova LB, Prodanetz NN, Dudenkova VV, Lukyanov SA, Zagaynova EV. Intracellular pH imaging in cancer cells in vitro and tumors in vivo using the new genetically encoded sensor SypHer2. Biochim Biophys Acta. 2015 Sep;1850(9):1905-11. doi: 10.1016/j.bbagen.2015.05.001.
37. Yuzhakova DV, Shirmanova MV, Serebrovskaya EO, Lukyanov KA, Druzhkova IN, Shakhov BE, Lukyanov SA, Zagaynova EV. CT26 murine colon carcinoma expressing the red fluorescent protein KillerRed as a highly immunogenic tumor model. J Biomed Opt. 2015 Aug 1;20(8):88002. doi: 10.1117/1.JBO.20.8.088002.

38. Shirmanova M, Yuzhakova D, Snopova L, Perelman G, Serebrovskaya E, Lukyanov K, Turchin I, Subochev P, Lukyanov S, Kamensky V, Zagaynova E. Towards PDT with Genetically Encoded Photosensitizer KillerRed: A Comparison of Continuous and Pulsed Laser Regimens in an Animal Tumor Model. (2015) PLoS ONE 10(12): e0144617.
39. Meleshina AV, Dudenkova VV, Shirmanova MV, Shcheslavskiy VI, Becker W, Bystrova AS, Cherkasova EI, Zagaynova EV. Probing metabolic states of differentiating stem cells using two-photon FLIM. Sci Rep. 2016 Feb 25;6:21853.
40. Timashev P, Kuznetsova D, Koroleva A, Prodanets N, Deiwick A, Piskun Y, Bardakova K, Dzhoyashvili N, Kostjuk S, Zagaynova E, Rochev Y, Chichkov B, Bagratashvili V. Novel biodegradable star-shaped polylactide scaffolds for bone regeneration fabricated by two-photon polymerization. *Nanomedicine (Lond)*. 2016 May;11(9):1041-53.
41. Druzhkova IN, Shirmanova MV, Lukina MM, Dudenkova VV, Mishina NM, Zagaynova EV. The metabolic interaction of cancer cells and fibroblasts - coupling between NAD(P)H and FAD, intracellular pH and hydrogen peroxide. Cell Cycle. 2016 May 2;15(9):1257-66.
42. Kuznetsova D, Prodanets N, Rodimova S, Antonov E, Meleshina A, Timashev P, Zagaynova E. Study of the involvement of allogeneic MSCs in bone formation using the model of transgenic mice. *Cell Adh Migr*. 2016 Jun 17:1-12.