

CURRICULUM VITAE

Natalia M. Shakhova

PERSONAL DATA

Last Name: Shakhova n

First Name: Natalia

Middle Name: Mikhailovna

Date of Birth: 03 February 1957

Citizenship: Russian Federation

Place of birth: Gorky Region

CONTACT INFORMATION

Institute of Applied Physics of the Russian Academy of Sciences (IAP RAS)

Ulyanov St., 46,

Nizhny Novgorod, 603950

Russia

Tel: +7 831 4368010

Fax: +7 831 4363792

E-mail: shakh@ufp.appl.sci-nnov.ru,

<http://www.bioimaging.ru/>

PROFESSIONAL ACTIVITY

1991-1996: Assistant professor Nizhny Novgorod State Medical Academy. Department of Obstetrics and Gynecology,

1997-2000: Assistant professor Nizhny Novgorod State Medical Academy. Department of Obstetrics and Gynecology, Senior scientist Institute of Applied Physics of Russian Academy of Sciences

2001-- present: Leading scientist Institute of Applied Physics of Russian Academy of Sciences

2005-- present: Professor Nizhny Novgorod State Medical Academy, department of Obstetrics and Gynecology

2011-- present: Leading scientist Nizhny Novgorod State University

EDUCATIONAL ACTIVITY

1991-2001 - Assistant professor Nizhny Novgorod State Medical Academy. Department of Obstetrics and Gynecology, Gynecology for students of 4-6 course (faculty of general medicine, pediatric faculty, faculty of preventive medicine)

2005-H.B. - Professor Nizhny Novgorod State Medical Academy, department of Obstetrics and Gynecology, Gynecology for students of 4-6 course (faculty of general medicine, pediatric faculty, faculty of preventive medicine)

PROJECT MANAGEMENT

2001-2011: projects of Presidium RAS "Fundamental sciences for medicine"

2011-2013: RFBR 11-02-00916-a "Noninvasive monitoring of new photosensitizers with optical bioimaging"

2008-2009: RFBR 08-02-99049-p_офи "Development of optical bioimaging technology for PDT monitoring"

2005-2007: RFBR 05-02-16748-a "Study of turbid media by complementary use of cross-polarized optical coherence tomography (CP OCT) and polarized reflectance spectroscopy (PRS)"»

2002-2004: RFBR 02-02-17628-a "Potential and limitations of multiphoton fluorescence microscopy in turbid biotissues"

2002-2004: CRDF RB2-2389-NN-02 "Development of Methods for Early Diagnostics of Neoplasia Using Optical Coherence Tomography"

EDUCATIONAL BACKGROUND

1974-1980 - Nizhny Novgorod State Medical Academy

1980-1981 - postgraduate student at the Nizhny Novgorod State Medical Academy. N.Novgorod Maternity Hospital, specialization – Obstetrics and Gynecology

1996 - PhD Medicine

2005 - Doctor of Science Medicine

HONORS AND AWARDS

1999 - State Prize 1999 in Science and Technology

ACTIVITIES

Visitor researcher: **1998** - KARL STORZ GmbH & Co - France; **2003** - Cleveland Clinic Foundation, USA

Since 2005 - Program Committee member of the conference Optical Coherence Tomography and Coherence Domain Optical Methods in Biomedicine (Photonics West, BiOS), USA and the conference Optical Coherence Tomography and Coherence Techniques (SPIE/OSA European Conferences on Biomedical Optics), Germany

Since 2007 co-chair of the Optical Bioimaging conference (International Symposium TOPICAL PROBLEMS OF BIOPHOTONICS), Russia

Since 2011 member of Editorial Board of Photonics & Lasers in Medicine

Reviewer in: *Journal of Biomedical Optics* and *Modern Technologies in Medicine*

AREA OF EXPERTISE

oncogynecology, laparoscopy, hysteroscopy, colposcopy, biophotonics, optical bioimaging, laser surgery, photodynamic therapy

PUBLICATIONS

1. Sergeev A.M., Gelikonov V.M., Gelikonov G.V., Feldchtein F.I., Kuranov R.V., Gladkova N.D., Shakhova N.M., Snopova L.B., Shakhov A.V., Kuznetzova I.A., Denisenko A.N., Pochinko V.V., Chumakov Y.P., Streltzova O.S. In vivo endoscopic OCT imaging of precancer and cancer states of human mucosa // *Optics Express*. - 1997. - V. 1, N. 13. - P. 432-440.
2. Feldchtein F.I., Gelikonov G.V., Gelikonov V.M., Kuranov R.V., Sergeev A.M., Gladkova N.D., Shakhov A.V., Shakhova N.M., Snopova L.B., Terent'eva A.B., Zagainova E.V., Chumakov Y.P., Kuznetzova I.A. Endoscopic applications of optical coherence tomography // *Optics Express*. - 1998. - V. 3, N. 6. - P. 257-269
3. Shakhova N., Shakhov A., Terentjeva A., Feldchtein F., Gladkova N., Kamensky V. The using of Optical Coherence Tomography for intrasurgical detection of larynx carcinoma borders // *Laser in Surgery and Medicine*. – 1999, Vol. 25 (September) – P.49-50
4. Shakhova N., Kuznetzova I., Kachalina T., Gladkova N., Gelikonov V., Gelikonov G. Capability of Optical Coherence Tomography in control of treatment of cervical pathology // *Laser in Surgery and Medicine*. – 1999, Vol.25(September) – P.36-37
5. Kuranov R.V., Sapozhnikova V.V., Shakhova N.M., Gelikonov V.M., Zagainova E.V., Petrova S.A. Combined application of optical methods to increase the information content of optical coherent tomography in diagnostics of neoplastic processes // *Quantum Electronics*. - 2002. - V. 32, N. 11. - P. 993-998
6. Shakhova N.M., Feldchtein F.I., Sergeev A.M. Applications of Optical Coherence Tomography in Gynecology // *Handbook of Optical Coherence Tomography/ B.E. Bouma and G.J. Tearney, Editors*. - New York, Basel: Marcel Dekker, Inc., 2002. - P. 649-672
7. Shakhova N.M., Gelikonov V.M., Kamensky V.A., Kuranov R.V., Turchin I.V. Clinical Aspects of the Endoscopic Optical Coherence Tomography and the Ways for Improving Its Diagnostic Value // *Laser Physics*. - 2002. - V. 12, N. 4. - P. 617-626

8. Gelikonov V.M., Gelikonov G.V., Dolin L.S., Kamensky V.A., Sergeev A.M., Shakhova N.M., Gladkova N.D., Zagaynova E.V. Optical Coherence Tomography: Physical Principles and Applications // *Laser Physics*. - 2003. - V. 13, N. 5. - P. 692-702
9. Shakhova N.M., Kuznetzova I.A., Kachalina T.S., Gladkova N.D., Gelikonov V.M., Kamensky V.A., Feldchtein F.I. Optical Coherence Tomography in Diagnosis of Cervical Neoplasia // 5th International Multidisciplinary Congress "Eurogin 2003", Paris. Monduzzi Editore S.p.A. - Medimond Inc., 2003. - P. 225-229
10. Shakhova N.M., Sapozhnikova V.V., Kamensky V.A., Kuranov R.V., Loshenov V.B., Petrova S.A., Myakov A.V. Optical Methods for Diagnosis of Neoplastic Processes in the Uterine Cervix and Vulva // *Journal of Applied Research*. - 2003. - V.3 (2).- P.144-155
11. Escobar P.F., Belinson J.L., White A., Shakhova N.M., Feldchtein F.I., Kareta M., Gladkova N.D. Diagnostic efficacy of optical coherence tomography in the management of pre-invasive and invasive cancer of the uterine cervix and the vulva. // *Intern. J.Gynecological Cancer*. - 2004. - V. 14, N. 3
12. Dolin L.S., Feldchtein F.I., Gelikonov G.V., Gelikonov V.M., Gladkova N.D., Iksanov R.R., Kamensky V.A., Kuranov R.V., Sergeev A.M., Shakhova N.M., Turchin I.V. Fundamentals and Clinical Applications of the PM-Fiber Based Endoscopic OCT // *Coherent-Domain Optical Methods Biomedical Diagnostics, Environmental and Material Science*./: Kluwer Academic Publishers, 2004. - P.- 211-271
13. Gelikonov G.V., Gelikonov V.M., Ksenofontov S.U., Morosov A.N., Myakov A.V., Potapov Y.P., Sapozhnikova V.V., Sergeeva E.A., Shabanov D.V., Shakhova N.M., Zagaynova E.V. Compact Optical Coherence Microscope // *Coherent-Domain Optical Methods Biomedical Diagnostics, Environmental and Material Science*./: Kluwer Academic Publishers, 2004. - P. 345-363
14. V. V. Sapozhnikova, N. M. Shakhova, V. A. Kamensky, S. A. Petrova, L. B. Snopova, and R. V. Kuranov Capabilities of Fluorescence Spectroscopy Using 5-ALA and Optical Coherence Tomography for Diagnosis of Neoplastic Processes in the Uterine Cervix and Vulva // *Laser Physics*, Vol. 15, No. 12, 2005, 1664
15. Ilya V. Turchin, Ekaterina A. Sergeeva, Lev S. Dolin, Natalia M. Shakhova, Rebecca Richards-Kortum. Novel algorithm of processing Optical Coherence Tomography images for differentiation of biological tissue pathologies // *Journal of Biomedical Optics*, 2005 J. Biomed. Opt. Vol. 10, 064024-1-11
16. Ilya V. Turchin, Vladimir I. Plehanov, Anna G. Orlova, Vladislav A. Kamensky, Mikhail S. Kleshnin, Marina V. Shirmanova, Natalia M. Shakhova, Irina V. Balalaeva and Alexander P. Savitsky Fluorescence diffuse tomography of small animals with DsRed2 fluorescent protein//*Laser Physics*, 2006, Vol.16, N 5, pp. 741-746
17. A.G. Orlova, I.V. Turchin, V.I. Plehanov, N.M. Shakhova, I.I. Fiks, M.I. Kleshnin, N.Yu. Konuchenko, and V.A. Kamensky "Frequency-domain diffuse optical tomography with single source-detector pair for breast cancer detection", *Laser Physics Letters*, Vol.5, No 4, 2008, pp.321-335
18. E. Zagaynova, N. Gladkova, N. Shakhova, G. Gelikonov, and V. Gelikonov Endoscopic OCT with forward looking probe: clinical studies in urology and gastroenterology // *Journal of biophotonics*, 1 (No2), 2008, pp.114-128
19. A.B. Terenteva, A.V. Shakhov, A.V. Maslennikova, N.D. Gladkova, V.A. Kamensky, F.I. Feldchtein, and N.M. Shakhova. Chapter 36. OCT in Laryngology. *Optical Coherence Tomography: Technology and Applications*. Ed. By Wolfgang Drexler and James G. Fujimoto. Springer. 2008, p.1123-1150
20. I.A. Kuznetsova, N.D. Gladkova, V.M. Gelikonov, J.L. Belinson, N.M. Shakhova, and F.I. Feldchtein. Chapter 39. OCT in Gynecology. *Optical Coherence Tomography: Technology and Applications*. Ed. By Wolfgang Drexler and James G. Fujimoto. Springer. 2008., 1211-1240

21. E.V. Zagaynova, N.D. Gladkova, O.S. Streltsova, G.V. Gelikonov, N. Tresser, F.I. Feldchtein, M.J. Manyak, and N.M. Shakhova. Chapter 40. Optical Coherence Tomography in Urology. *Optical Coherence Tomography: Technology and Applications*. Ed. By Wolfgang Drexler and James G. Fujimoto. Springer. 2008, 1241-1268
22. Anna V. Maslennikova, Anna G. Orlova, German Yu. Golubiatnikov, Vladislav A. Kamensky, Natalia M. Shakhova, Aleksey A. Babaev, Ludmila B. Snopova, Irina P. Ivanova, Vladimir I. Plekhanov, Tatyana I. Prianikova and Ilya V. Turchin, Comparative study of tumor hypoxia by diffuse optical spectroscopy and immunohistochemistry in two tumor models. *Journal of Biophotonics*, 2010, 3(12), 743–751
23. V. Gelikonov, G. Gelikonov, M. Kirillin, N. Shakhova, A. Sergeev, N. Gladkova, E. Zagaynova “Fiber-Based OCT: From Optical Design to Clinical Applications”, Chapter 16 in *Handbook of Photonics for Biomedical Science* (Ed. – V.V. Tuchin), CRC Press, Boca Raton, London, New York, Washington, 2010, pp. 423-444
24. Oleg L. Antipov, Nikita G. Zakharov, Michael Fedorov, Natalia M. Shakhova, Natalia N. Prodanets, Ludmila B. Snopova, Valerij V. Sharkov, Ronald Sroka Cutting effects induced by 2- μ m laser radiation of cwTm:YLF and cw and Q-switched Ho:YAG lasers on *ex-vivo* tissue. *Medical Laser Application* 26 (2011) 67–75
25. Elena 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

Patents

Patent USA № 6608684. Gelikonov G.V., Gelikonov V.M., Gladkova N.D., Sergeev A.M., Shakhova N.M., Feldchtein F.I. Optical coherence tomography apparatus, optical fiber lateral scanner and a method for studying biological tissues in vivo. - 2003

Patents in Russian Federation in the area of optical diagnostics № 2006123591, №2009129237, № 2010121464, 2011132172

Invited talks

N. Shakhova, G. Gelikonov, V. Gelikonov, V. Kamensky, I. Kuznetsova, A. Maslennikova, A. Orlova, O. Streltsova, I. Turchin, E. Zagaynova Optical tomography in treatment planning and treatment control in oncology, 1st German–Russian Oncology Symposium, Munich, Germany; 25–26 June, 2010

Natalia Shakhova, Irina Kuznetsova, Olga Panteleeva, Olga Kachalina, Darja Bundina, Natalia Illarionova, Oxana Onoprienko, Ekaterina Yunusova OCT in diagnosing of tumor and non-tumor pathologies, Nineteenth International Conference on Advanced Laser Technologies, ALT'2011, Bulgaria, 3-8 September, 2011