ADVANCE
University of Rhode Island
advance1@etal.uri.edu
http://www.uri.edu/advance
Phone: (401) 874-9422
Fax: (401) 874-5780

Yana K. Reshetnyak

NSF Advance Assistant Professor
Department of Physics
University of Rhode Island
Kingston, RI 02881
Tel: (401) 874-5586 ♦ E-mail: reshetnyak@mail.uri.edu
URL: http://www.phys.uri.edu/people/reshetnyak.html

Education

1988-1993:	Department of Physics, St.-Petersburg State University, St.-Petersburg, Russia
1993:	M.S. in Physics (Molecular Biophysics), Diploma with Honours, Physics Department, St.-Petersburg State University, St.-Petersburg, Russia
1996 - 2000:	Postgraduate Student, Laboratory of Functional Biophysics of Proteins, Institute of Theoretical and Experimental Biophysics Russian Academy of Sciences, Puschino, Russia.
2000:	Ph.D. in Physical and Mathematical Sciences (Biophysics) Institute of Theoretical and Experimental Biophysics Russian Academy of Sciences, Puschino, Moscow Region, Russia. (Relations between Fluorescence Parameters of Tryptophan Residues and the Structural and Physical Characteristics of Microenvironment of Indole Rings in Proteins, Supervisor: Professor Edward A. Burstein)

Research Interests: *Biophysics*

Protein fluorescence spectroscopy

- general relation between spectral and structural parameters of proteins
- development of mathematical and computational algorithms of protein spectral and structural analysis

Folding of membrane proteins

- kinetics and thermodynamics

Design and development of pH-sensitive delivery peptides

- mechanism of peptides interaction with cell membrane and translocation of molecules (drugs or imaging probes) through the membrane.
- whole-body fluorescence imaging

Professional Experience

2004-present: *Assistant Professor*, NSF Advance Faculty Fellow, Physics Department, University of Rhode Island, Kingston, Rhode Island.

2004-present: *Affiliated Member*, Department of Molecular Biophysics and Biochemistry, Yale University, New Haven, Connecticut.

2003 - 2004: *Postdoctoral Research Associate*; Laboratory headed by Prof. D.Engelman, Department of Molecular Biophysics and Biochemistry, Yale University, New Haven, Connecticut.

2000 - 2003: *Postdoctoral Research Associate*; Laboratory headed by Prof. R. Goldfarb, Department of Molecular Biology and Immunology, Institute for Cancer Research, University of North Texas Health Science Centre, Fort Worth, Texas.

Visiting Scientist at the Laboratories

1999: Department of Biology, Johns Hopkins University, Baltimore, Maryland.

1998: Department of Molecular Biology and Immunology, University of North Texas Health Science Centre, Fort Worth, Texas.

1998: Department of Gene Regulation and Protein Function, Tokyo Metropolitan Institute of Gerontology, Tokyo, Japan.

1997 — 1998: Muscle Research Unit, University of North Sydney, Sydney, Australia.

1997: Laboratoire de Biophysique, Faculte de Pharmacie, Universite Louis Pasteur, Strasbourg, France.

Awards

2004: NSF Advance Faculty Fellow.

2002: Laureate of the Gregorio Weber International Competition for the best dissertations in Biological Fluorescence (Theory of Protein Fluorescence).

1998: Stefan Batory Foundation grant to participate in The Jablonski Centennial Conference on Luminescence and Photophysics, Torun, Poland.

1998: Soros PhD-student grant award # a98-1929.

1997: Wood/Whelan Fellowship from the International Union of Biochemistry and Molecular Biology (host Institute of Biomedical Research, University of Sydney, Sydney, Australia)

1997: Soros PhD-student grant award # a97-1841.

1997: Fellowship of British Biophysical Society to participate in 2nd European Biophysical Congress (EBSA97) Orleans, France.

1997: Travel-grant #97-04-58767, Russian Foundation for Basic Research (RFBR) to participate in 2nd European Biophysical Congress (EBSA97) Orleans, France, 1997

1997: Fellowship to the 41st Annual Meeting of the American Biophysical Society, New Orleans, USA, 1997.

1997: Fellowships to XXXI School of Young Scientists in Molecular Biology and Biophysics (Russian Academy of Science), Chernogolovka, Russia.

1996: Fellowships to XXX School of Young Scientists in Molecular Biology and Biophysics (Russian Academy of Science), Sank-Petersburg, Russia.

Invited seminars

2004: Physics Department, University of Rhode Island, Kingston, Rhode Island.

2003: Chemistry Department, Yale University, New Haven, Connecticut.

2002: Biochemistry and Biophysics Department, University of Pennsylvania, Philadelphia, Pennsylvania.

2001: Biophotonics Center, Case Western Reserve University, Cleveland, Ohio.

1998: Department of Gene Regulation and Protein Function, Tokyo Metropolitan Institute of Gerontology, Tokyo, Japan.

1997: Muscle Research Unit, University of North Sydney, Sydney, Australia.

1997: Laboratoire de Biophysique, Faculte de Pharmacie, Univ. Louis Pasteur, Strasbourg, France.

Professional associations

Biophysical Society of the U.S.A.

New York Academy of Sciences.

Publications: *Papers*

Andreev, O.A., & Ya.K., Reshetnyak. (submitted) The interface dynamics of force generating actomyosin complex.

Reshetnyak, Ya.K., Andreev, O.A., Lehnert, U., & Engelman, D.M. (submitted) pH-Selective Drug Delivery into Cells.
Linke D., Frank J., Pope M.S., Soll J., Ilkavets I., Fromme P., Burstein E.A., Reshetnyak Y.K., Emelyanenko V.I. (2004) Folding Kinetics and Structure of OEP16, Biophys.J., 86(3), 1479-1487.
Reshetnyak Ya.K., R. P. Kitson, M. Lu, and R. H. Goldfarb. (2004) Conformational and enzymatic changes of 20S proteasome of rat natural killer cells induced by mono and divalent cations. J. Struct. Biol., 145(3), 263-271.
Engelman D.M., Chen Y., Chin C.-N., Curran R., Dixon A.M., Dupuy A., Lee A., Lehnert U., Mathews E., Reshetnyak Ya.K., Senes A., Popot J.-L. (2003) Membrane Protein Folding: Beyond the Two Stage Model. FEBS Lett, 555 (1), 122-125.
Orlov N.Ya, Ya.K. Reshetnyak, T.G. Orlova, D.N. Orlov, Burstein E.A., Y. Ishijima, N. Kimura (2003) Protein fluorescence study of chimeras and tagged forms of recombinant rat nucleoside diphosphate kinases alpha and beta. Biological Membranes (Moscow), 20 (1), 53-59.
Andreev O.A., Ya.K. Reshetnyak, and R. H. Goldfarb. (2002) Evidence of inter- and intra-molecular cross-linking of tyrosine residues of calmodulin induced by photo-activation of ruthenium(II). Photochem. Photobiol. Sci., 1 (10), 834-836
Reshetnyak Ya.K., and O.A. Andreev (2001) The interdomain motion in myosin subfragment 1, Biophys. Chem. 94 (1-2), 41-46.
Reshetnyak Ya.K., Yu. Koshevnik, and E.A. Burstein (2001) Decomposition of protein tryptophan fluorescence spectra into log-normal components: III. Correlation between fluorescence and microenvironment parameters of individual tryptophan residues, Biophys. J., 81 (3), 1735-1758.
Reshetnyak Ya.K., and E.A. Burstein (2001) Decomposition of protein tryptophan fluorescence spectra into log-normal components: II. The statistical proof of discreteness of tryptophan classes in proteins, Biophys. J., 81 (3), 1710-1734.
Burstein E.A., S.M. Abornev, and Ya.K. Reshetnyak (2001) Decomposition of protein tryptophan fluorescence spectra into log-normal components: I. Algorithm of decomposition, Biophys. J., 81 (3), 1699-1709.
Reshetnyak, Ya. K., O.A. Andreev, and R.H. Goldfarb (2001) Photoactivatable inhibitors of matrix metalloproteinases. Proceed. Amer. Assoc. Cancer Res., 5082, 945-946.
Borejdo, J., D. S. Ushakov, R. Moreland, I. Akopova, Ya. Reshetnyak, L. D. Saraswat, K. Kamm, and S. Lowey, (2001) The Power Stroke Causes Changes in the Orientation and Mobility of the Termini of Essential Light Chain 1 of Myosin, Biochemistry, 40(13), 3796-3803.
Reshetnyak, Ya.K., O. A. Andreev , J. Borejdo, D. D. Toptygin, L. Brand, and E. A. Burstein (2000) The Identification of Tryptophan Residues Responsible for ATP-induced Increase in Intrinsic Fluorescence of Myosin Subfragment 1, J Biomol. Struct. Dynamics, 18(1), 113-125.
Emelyanenko V.I., Reshetnyak Ya.K., Andreev O.A., and Burstein E.A. (2000) Log-normal component analysis of fluorescence spectra of Prodan and Acrylodan bound to proteins, Biophysics (Moscow), 45(2), 207-219.
Orlov N.Ya, Orlova T.G., Ya. K. Reshetnyak, E.A. Burstein, and N. Kimura (1999) Comparative study of recombinant rat nucleoside diphosphate kinases alpha and beta by intrinsic protein fluorescence, J Biomol Struct Dyn, 16(4), 955-68.
Reshetnyak Ya.K., and E.A. Burstein (1997) Assignment of log-normal components of fluorescence spectra of serine proteases to the clusters of tryptophan residues, Biophysics (Moscow), 42(4), 785-795.
Reshetnyak Ya.K., and E.A. Burstein (1997) Assignment of log-normal components of protein fluorescence spectra to individual tryptophan residues using their microenvironment properties in three-dimensional structure, Biophysics (Moscow), 42(2), 293-300.
Orlov N. Ya., T.G. Orlova, Ya.K. Reshetnyak, E.A. Burstein, and N. Kimura (1997) Interaction of recombinant rat nucleoside diphosphate kinase with bleached bovine rod outer segment membranes: a possible mode of pH and salt effects, Biochemistry and Molecular Biology International, 41(1), 189-198.
Karsanov N.V., G.V. Sukoyan, D.R. Tatulashvili, E.B. Yarovaya, T.G. Samsonidze, Z.N. Karsanov, E.I. Guchua, Z.G. Khugashvili, Ya.K. Reshetnyak, V.M. Pirskhalaishvili, I.I. Goreliashvili, and N.N. Kipshidze (1995) Subcellular basis of the myocardial contractile activity disturbance in the dynamic of alcoholic damage development, Questions of Narcology (Moscow), 4, 48-52.
Karsanov N.V., G.V. Sukoyan, E.B. Yarovaya, Z.N. Karsanov, Z.G. Khugashvili, D.R. Tatulashvili, T.G. Samsonidze, V.M. Pirskhalaishvili, Ya. K. Reshetnyak, I.I. Goreliashvili, and N.N. Kipshidze (1995) Subcellular basis of the myocardial contractile activity disturbance in acute alcoholic intoxication, Questions of Narcology (Moscow), 3, 36-41.

Patents

Selective Drug Delivery into or Marking of Diseased Tissue Regions using Environmentally Sensitive Transmembrane Peptide Insertion. (YALE OCR 3054) USA patent pending.
Yana K Reshetnyak, Oleg A. Andreev, Ursula Lehnert, and Donald M. Engelman