

BIOGRAPHICAL SKETCH

Alexander N. Asanov, Ph.D.

CEO and Scientific Director, TIRF Labs
106 Grendon Place, Cary NC 27519
alex.asanov@tirf-labs.com mobile 919-903-4792

Summary. Before founding TIRF Labs in 2004, Dr. Asanov held academic positions at the Institute of Chemical Physics, Russian Academy of Sciences (RAS), the University of Alabama at Birmingham, and Mississippi State



University. He received M.S. degree in Biophysics from the Moscow Institute for Physics and Technology, and Ph.D. degree in Chemical Physics from the Institute of Chemical Physics, RAS. His Ph.D. advisor was Nobel Prize laureate academician N. N. Semenov. In the period 2004-2011 Dr. Asanov served as the Principal Investigator on several BAA and SBIR projects sponsored by the U.S. government through the National Institutes of Health and the U.S. Homeland Security Advanced Research Projects Agency (HSARPA).

Personal Statement:

I, Dr. Alexander Asanov, believe that I am well-suited to lead the iDiagnostics project. This project logically builds upon my prior work. In 1999-2014, I served as Principal Investigator on several BAA and SBIR grants, awarded by NIH and HSARPA. I assembled and led a team of extraordinary talented and productive scientists and engineers, who have developed a family of innovative TIRF instruments for molecular diagnostics and analysis of biomolecular interactions. My colleagues and I have pioneered several groundbreaking discoveries and accumulated unique experience in using the TIRF technique and other analytical methods for life science applications. I have a broad background in spectroscopy, electrochemistry, surface chemistry, molecular biology, cell biology, nanoengineering, mechanical engineering, and optical engineering, which are key areas for this project. Each of our prior projects resulted in the development of advanced TIRF devices and instruments. Our customers from academic and pharmaceutical research groups have generated unique research data using our products, and have published articles in leading scientific journals. I have a record of successful R&D projects in the area of molecular diagnostics and believe that my prior experiences have prepared me well to lead the proposed project.

I am a naturalized U.S. citizen. In 1994, I immigrated to the US from Russia. On my 24th year in the U.S, I feel that I am more American than Russian. My second Motherland recognized my accomplishments and rewarded me more than I could have dreamt of in Russia. I want to give back to society and believe that the development of iDiagnostics is the way, in which I can demonstrate my gratitude to America and the world. Although I have successfully managed all scientific, administrative, financial, and human resources aspects of our prior projects, during Phase 2 of the iDiagnostics project I intend to step down from the position of Chief Executive Officer to a position of Chief Scientific Officer. Respectively, in Phase 1, we will be looking for a candidate for CEO position, whose perception of the goal and the spirit of the iDiagnostics project would be close to ours.

Positions and Employment

1987-1994 Senior Research Scientist, Institute of Chemical Physics of the Russian Academy of Sciences, Moscow, Russia.

1994–2001 Research Scientist / Instructor, Center for Macromolecular Crystallography, University of Alabama at Birmingham, and Department of Chemistry, Mississippi State University, MS.

2001 – 2011 President and Scientific Director, TIRF Technologies, Inc.

2012 –present CEO and Scientific Director, TIRF Labs, Inc.

Other Experience and Professional Memberships

2003-present - NIH Study Sections CBA10B, NCI MAT 309, member
 2008-present – NSF Panel of Reviewers, member, and ad hoc reviewer

Professional Societies:

1994 - present - American Chemical Society, member
 1994 - present - Biophysical Society, member
 1997- present - Society for Applied Spectroscopy, member
 1997- present - American Association for Advancement of Sciences, member

Honors

1990 - N.N. Semenov's Award
 1991 - Russian Academy of Science Award for Best Interdisciplinary Research

Selected Invited Lectures

1998 Invited speaker at the FACSS'98 meeting, Austin, Texas.
 2009 Invited speaker at the international conference PepCon 2009, Seoul, South Korea.
 2007, 2009, 2010, 2012, 2014, 2016 Invited speaker at the International Conferences Biodetection Technologies, USA.
 2013 Invited speaker at the international conference Evanesence 2013, Paris, France.
 2011, 2015 Invited speaker at the Point of Care Diagnostics World Congress, San Diego, USA.
 2016 – invited speaker at the 4th Midwest Single Molecule Workshop, University of Iowa, Iowa City.
 2016 - SelectBio Conferences\NGS, SCA, SMA, MS: Research to Diagnostics, San Diego, CA.
 2017 – invited speaker at the National Laboratory of Biomacromolecules, Institute of Biophysics, Chinese Academy of Sciences, Beijing, China.

Education/Training

Institution and Location	Degree	Year	Field of Study
Moscow Institute for Physics and Technology, Moscow	M.S.	1972	Biophysics
Institute of Chemical Physics, Russian Academy of Sciences, Moscow	Ph.D.	1977	Chemical Physics

Selected Peer-Reviewed Publications (from 58 total)

Asanov, A.N.; Larina, L.L. Electrochemical control of protein interactions with solid surfaces. Editor: Allen, Milton J. Charge and Field Effect in Biosystems-3, (1992), 13-27. Publisher: Birkhaeuser, Boston, MA.

Asanov, A.N.; De Lucas, L.J.; Oldham, P.B.; Wilson, W. W. Heteroenergetics of bovine serum albumin adsorption from good solvents related to crystallization conditions. J. Colloid Interface Sci. (1997), 191(1), 222-235.

Asanov, A.N.; De Lucas, L.J.; Oldham, P.B.; Wilson, W. W. Interfacial aggregation of bovine serum albumin related to crystallization conditions studied by total internal reflection fluorescence. J. Colloid Interface Sci. (1997), 196 (1), 62-73.

Asanov, A.N.; Wilson, W. W., Oldham, P.B. Regenerable Biosensor Platform: A Total Internal Reflection Fluorescence Flow Cell with Electrochemical Control. *Analytical Chemistry* (1998), 70 (6), 1156-1163.

Qian, F.; Asanov, A. N.; Oldham, P. B. A total internal reflection fluorescence biosensor for aluminum (III). *Microchem. J.* (2001), 70 (1), 63-68.

Sampieria A.; Zepeda, A; Asanov, A.; Vaca, L. Visualizing the store operated channel complex assembly in real time: Identification of SERCA2 as a new member. *Cell Calcium*, 45, (2009), 439–446.

Asanov, A.; Zepeda, A.; Vaca L. A novel form of Total Internal Reflection Fluorescence Microscopy (LG-TIRFM) reveals different and independent lipid raft domains in living cells. *Biochimica et Biophysica Acta*, 1801 (2010), 147-155.

Asanov A.; Zepeda A.; and Vaca L. A Platform for Combined DNA and Protein Microarrays Based on Total Internal Reflection Fluorescence. *Sensors*, 2012, 12, 1800.
Luz-Madriral A.; Asanov A.; Camacho-Zarco A.R.; Sampieri A.; and Vaca L. A Cholesterol Recognition Amino Acid Consensus Domain in GP64 Fusion Protein Facilitates Anchoring of Baculovirus to Mammalian Cells. *Journal of Virology*, 87 (2013), 11894-11907.

Asanov A.; Sherry R.; Sampieri A.; and Vaca L. A relay mechanism between EB1 and APC facilitate STIM1 puncta assembly at endoplasmic reticulum–plasma membrane junctions. *Cell Calcium*, 54 (2013), 246–256.

Asanov A, Sampieri A, Moreno C, Pacheco J, Salgado A, Sherry R, Vaca L. Combined single channel and single molecule detection identifies subunit composition of STIM1-activated transient receptor potential canonical (TRPC) channels. *Cell Calcium*. 2015 Jan; 57(1):1-13.

Asanov A, Zepeda A, Vaca L. A novel form of Total Internal Reflection Fluorescence Microscopy (LG-TIRFM) reveals different and independent lipid raft domains in living cells. *Biochim Biophys Acta*. 2010 Feb;1801(2):147-55.

Asanov A, Sherry R, Sampieri A, Vaca L. A relay mechanism between EB1 and APC facilitate STIM1 puncta assembly at endoplasmic reticulum-plasma membrane junctions. *Cell Calcium*. 2013 Sep;54(3):246-56.

Luz-Madriral A, Asanov A, Camacho-Zarco AR, Sampieri A, Vaca L. A cholesterol recognition amino acid consensus domain in GP64 fusion protein facilitates anchoring of baculovirus to mammalian cells. *J Virol*. 2013 Nov;87(21):11894-907.

Asanov A, Sampieri A, Moreno C, Pacheco J, Salgado A, Sherry R, Vaca L. Combined single channel and single molecule detection identifies subunit composition of STIM1-activated transient receptor potential canonical (TRPC) channels. *Cell Calcium*. 2015 Jan;57(1):1-13.

Pacheco J, Dominguez L, Bohórquez-Hernández A, Asanov A, Vaca L. A cholesterol-binding domain in STIM1 modulates STIM1-Orai1 physical and functional interactions. *Sci Rep*. 2016 Jul 27;6:29634

Méndez-Acevedo KM, Valdes VJ, Asanov A, Vaca L. A novel family of mammalian transmembrane proteins involved in cholesterol transport. *Sci Rep*. 2017 Aug 7;7(1):7450.

Bohórquez-Hernández A, Gratton E, Pacheco J, Asanov A, Vaca L. Cholesterol modulates the cellular localization of Orai1 channels and its disposition among membrane domains. *Biochim Biophys Acta*. 2017 Dec;1862(12):1481-1490.

Patents

Asanov, Alexander N.; Wilson, W. William; Oldham, Philip B. Regenerable biosensor using total internal reflection fluorescence with electrochemical control. U.S. Patent 6,511,854 (2003).

Research Support

Ongoing Research Support N/A

Completed Research Support

5 R 44 RR014385-02 Asanov (PI) 09/01/02 – 02/28/05

NIH/NCCR Phase II SBIR

Fluorescence System for Sensing Biospecific Interactions

Development of a turnkey analytical grade TIRF instrument.

Role: PI

1 R43 EB000644-01 Asanov (PI) 09/01/03-08/31/04

NIH/NIBIB Phase I SBIR

Rapid Estimation of Gene Expression in Tissue Slices.

Development of a method for rapid analysis of cancerous tissues.

Role: PI

1 R43 RR14385-01 Asanov (PI) 09/15/99 -03/14/00

NIH/NCCR Phase I SBIR

Fluorescence System for Sensing Biospecific Interactions

Development of a total internal reflection fluorescence (TIRF) flow system for sensing biomolecular interactions.

Role: PI

Phase II SBIR Contract No. NBCHC050060 Asanov (PI) 08/31/05-04/30/08

HSARPA of the Department of Homeland Security

Rapid Multianalyte Yoctomolar Biosensor Platform

Development of a portable multianalyte biosensor for rapid analysis of bioterror agents.

Role: PI

BAA BIAD2 Phase I Contract No NBCHC070128 Asanov (PI) 08/27/07-08/26/08

HSARPA of the Department of Homeland Security

Rapidly Responding Assays for Detection of Biothreats

Development of assays for rapid detection of DNA/RNA and protein bioterror targets.

Role: PI

Phase II SBIR Contract No NBCHC070099 Asanov (PI) 7/10/07-7/9/09

HSARPA of the Department of Homeland Security

Handheld Biosensor Platform

Development of a handheld biosensor for rapid field analysis of bioterror agents.

Role: PI