

Materials Research and Education Center
201 Ross Hall
Auburn University, AL 36849-5341
Phone: 334 844 4485, Fax: 334 844 3400
E-mail: als@eng.auburn.edu
Personal Web: <http://www.eng.auburn.edu/~simonal/>

EDUCATION:

1993 Doctor of Science (Bioengineering). Dissertation topic: “Flow-injection biosensors based on immobilized enzymes and cells”, Moscow Institute of Applied Biochemistry, Moscow, Russia.

1973 Ph.D. (Molecular Biophysics) Dissertation topic: “Ionophore as an Electric Shunt in the Muscle Fiber Membrane”, USSR Academy of Science, Yerevan, Armenia, (USSR at that time).

1969 Master of Science (Physics) Thesis topic: “Electrochemistry of membranes”, Physics Department of Yerevan State University, Yerevan, Armenia, (USSR at that time).

POSITIONS HELD:

2003 - current Associate Professor, Auburn University, Materials Research & Education Center, Sam Ginn College of Engineering, Auburn, Alabama.

1994-2002 Visiting Associate Professor, Texas A&M University, Biochemistry and Biophysics Department, and Chemical Engineering Department, College Station, TX.

1998 Visiting Research Professor, Department of Genetics, University of Washington, Seattle.

1988-1994 Head of Biosensors Laboratory, Yerevan Physics Institute, Yerevan, Armenia.

1993-1994 Senior Consultant, University of Genoa/ Technobiochip Inc., Sicily, Italy.

1979-1988 Senior Research Scientist, Laboratory of Biosensors, Yerevan Physics Institute, Yerevan, Armenia.

1968-1979 Research Scientist, Biophysics Laboratory, Yerevan Physics Institute, Yerevan, Armenia.

RESEARCH INTERESTS AND EXPERTISE:

- Development and fabrication of biosensors for environmental analysis (CW and BW agents, phenols, mercury), food safety (pathogens), medicine (glucose, uric acid, amino acids) agriculture (pesticides), veterinary (express monitoring of animals health status), industrial process control (amino acids and alcohol)
- Direct and discriminative detection of OP neurotoxins (pioneering work)
- Application of Plasmon Resonance Spectroscopy for biomolecules/surface interaction analysis
- Nanocomposite films and nanoparticles for sensing applications
- Optical imaging and fluorescence spectroscopy
- Enzyme- and affinity-based biosensors
- Cell- and cell culture- based probes
- Flow Injection Analysis and microfluidic system
- Stochastic fluctuations in microbiosensors
- Biomaterials and bio-surfaces

TEACHING EXPERIENCE:

- Yerevan Polytechnic Institute, molecular physics and biophysics lectures (1983 - 1985)
- Texas A&M University, laboratory research classes (1996-2001)
- Texas A&M University, Department of Chemical Engineering, CHEN-689 “*Chemical and Biological Sensors*”, (2002).

Auburn University, Materials Engineering Program, MATL 6400 “Physics of Solids”; MATL 7970 “Biosensors”; MATL 6970 “Biomaterials”.

MEMEBERSHIP

- The American Chemical Society
- The Electrochemical Society
- IUPAC
- Sigma Xi
- Member-Correspondent of Armenian Academy of Engineers (Elected in 1994)
- Armenian Biophysical Association, the Member of the Presidium

AWARDS

- USSR National Scientific-Technical Society Award “For the Best Medical Device in 1991”
- USSR Ministry Council Award, 1990
- Yerevan State University Award for best Mentor in Modern Bioengineering, 1989
- Armenian National Academy Award for Best Research Projects, 1982, 1988
- Yerevan Physics Institute Outstanding Young Scientist Award, 1973
- Yerevan State University physics Department Award, 1968

PROFESSIONAL ACTIVITIES

- Member of NSF Panel Review (2002 - current)
- Member of NIH Biomaterials Panel Review (2003 – current)
- Editorial Board Member of Sensor Letters Journal
- Board Member of the "Encyclopedia of SENSORS"
- Session Chair, ECS 2004 Joint International Meeting, Honolulu, Hawaii, October, 2004
- Session Chair, BMES 2003 Annual Fall Meeting, Nashville TN, October, 2003.
- Secretary, Armenian Engineering Academy Seminar on Bioengineering (1991-1994)
- Session Chair, Biosensor Application in Industry and Medicine, International Symposium on Bioanalytical Methods, Prague, Czechoslovakia, 1990
- Session Chair, Electrochemical Biosensors, Congers on Chemical Enzymology and Bioengineering, Tallinn (Estonia), September 1987
- Session Chair, Flow-Injection Sensors, Biosensors Development and Application International Symposium, Noe-Branderburg, GDR, May 1987
- Co-Chair, All-Soviet Union Seminar on Kinetic and Mechanisms of Enzyme Catalysis, Nor-Hambert, Armenia, 1985
- Chair, Biophysics Division, All-Union Meeting of Yang Scientists, Yerevan, Armenia, 1977

REVIEWER FOR:

- **Journals:** Langmuir, Analytica Chimica Acta, Biosensors and Bioelectronics, Sensors and Actuators, Biotechnology Progress, ACS Symposium Series, IEEE Sensors Journal, Journal of AOAC International.
- **Foundations:** NSF, NIH, American Institute of Biological Science and USAMRMC, US Civilian Research and Development Foundation (CRDF),

RESEARCH SUPPORT/GRANTS

- NIRT-NSF: Nanosensors Based on Responsive Polymer Brushes, Enzymatic Catalysis, and Plasmon Resonance Devices, NSF, PI - A. Simonian, Co-PIs – J. Wild (TAMU), S. Minko (CU), J. Fendler (CU), E. Hutter (CU). \$1,987,450, 2005-2008, Pending.

- Microfabricated Platform for Monitoring Metabolic Activity of a Small Cell Population, NSF, PI- A. Revzin (UC Davis), Co-PI – Simonian (Auburn University), \$968,246, 2005-2008. Pending.
- NSF Interagency Opportunities in Metabolic Engineering: Design, Control and Prediction of a Synthetic Cellular Unit, PI - J. Wild (TAMU), Co-PI - A. Simonian. \$ 562,480 2005-2008, pending.
- R21/R33: Nanoscale Detection of OP Neurotoxins, NIH, PI – A. Simonian, Co-PIs – B. Prorok, and M. Pishko. \$ 624,132, 2005 - 2010, Pending.
- Biosensor for Rapid Identification of *Campylobacter jejuni* and *C. coli* in Carcass Rinses. AU Biogrant Program 2005. PI - A. Simonian. \$30,805, 2005 –2006, pending.
- Acquisition of Surface Plasmon Resonance Biacore System for Multidisciplinary Research and Development in Auburn University, FY2005 DURIP PI- A. Simonian. \$292,661, pending
- A Supplemental Support Grant, with the main NSF Grant: “Nanoparticles-based Biosensor for Direct Detection of Organophosphate Chemical Warfare Agents and Neurotoxic Pesticides”, NSF, PI – A. Simonian, \$39,972, November 2004 – October 2006. Pending.
- Development of Biosensing Systems for Discriminating Between Different Classes of Neurotoxins Based on Coupled AChE-OPH Enzyme Monitors. TEES TAMU (through US Army Medical Research and Materiel Command).\$ 69,998, 2004-2005, [funded](#).
- Nanoparticles-based Biosensor for Direct Detection of Organophosphate Chemical Warfare Agents and Neurotoxic Pesticides. NSF, PI- Simonian, Co-PIs – J. Wild, and T. Good. (\$650,000, Total, 10/01/03 - 09/30/06), [funded](#).
- Acquisition of the First Surface Plasmon Resonance Biacore System for Multidisciplinary Research and Development in Auburn University, FY2004 DURIP PI- A. Simonian. \$277,011; Not funded.
- R21/R33: Nanoscale Detection of OP Neurotoxins, NIH, PI – A. Simonian, Co-PIs – B. Prorok, and M. Pishko. \$ 624,132, 04/01/2004 - 03/31/2009, Not funded.
- Nanosrtructures and Enzyme Supported Technological Solutions for Detection of CW Treat Agents, MURI, PI – A. Simonian, Co-PIs – J. Wild, R. M. Leblanc, P. Takhistov, and T. Good, \$5 M/5 years, white paper, pending.
- Development of smart biosensors for monitoring of chemical and biological toxins. PI- A. Simonian. \$150,000 01/01/03 - 12/31/03. State of Alabama, Auburn University AU Detection and Food Safety Center, [funded](#).
- Phage Binding for Continuous Anthrax Spore Detection, NIH, (\$579,999.00), 08.01.03 – 07.31.2005, PI - V. Petrenko, Co-Pis - V. Vodyanoy, B. Chin, A. Simonian, [funded](#).
- Robust Sensor System for Anthrax Threat Monitoring. DARPA, (\$1,344,656Total, 10/01/03 - 09/30/06), PI - V. Petrenko, Co-Pis - V. Vodyanoy, B. Chin, A. Simonian, pending.
- Phage-Derived Probes for Continuous Monitoring of Anthrax Threat, NSF, (\$749, 881 Total, 10/01/03 - 09/30/06), PI - V. Petrenko, Co-Pis - V. Vodyanoy, B. Chin, A. Simonian, Not funded.
- Understanding Amyloid Protein Interactions as a Step in the Discovery of New Approaches to Treat Alzheimer’s Disease. NSF (2003-206, \$640,000), Co-PIs: T. Good and A. Simonian, Not funded.
- Enzyme, Antibody, and Photocatalytically Active Nanoscale Scavengers and Sensors for CW and Biological Agents. MURI, (2001 – 2005, \$125,000/year), Co-Pis: A. Simonian and J. Wild
- Disaster Response and Emergency Medical Service. US Army Medical Research and Materiel Command. Contract with UT-Houston HSC. Co-Pis: A. Simonian and J. Wild (02/2000 – 11/2003) (\$270,000/year, 2-4 years, total \$750,000), [current](#).

- Discriminative Biosensors for the Detection of Organophosphate Neurotoxins. LG-3101, DOE (Sandia National Laboratory), PIs: A. Simonian and J. Wild, 1997 – 2001, \$315,000,
- Development of Microfabricated Fluoride Sensitive Films for Biosensor Applications"; CRDF award # AC2-962/NFSAT, PIs: A. Simonian and A. Flounders. 1998-1999, \$30,000
- Bioengineering Approaches for the Detection and Detoxification of Neurotoxic Pesticides in Rural and Urban Use. RPI-359, CRDF USA. PI –Co-PIs: J. Wild, S. Varfolomeyev, and A. Simonian. 1997-1999, \$60,000
- A Sensitive Biodetector for Pesticide Determination in Agricultural Products. FY 96-97. Research Enhancement Program, Texas A&M University System, Texas Agriculture Experiment Station. PI- J. Wild, Co-PIs A. Simonian. \$25,000
- Enzymatic Neutralization/Detoxification of Neurotoxic Chemical Warfare Agents. DISRM LG-941411, NATO Grant, PI –Co-PIs: A. L. Simonian, J. R. Wild, S. D. Varfolomeyev, and J. DeFrank, 1994-1995, \$60,000
- Network Component of Disarmament Technologies Linkage Grant. LG – 941410, NATO Grant. PI –Co-PIs: S. D. Varfolomeyev, J. DeFrank, and A. L. Simonian, 1994-1995, \$30,000
- The Influence of Electrostatic Field on Enzyme Kinetics", International Science Foundation (Sores Foundation), Grant SF00431, PI: A. Simonian, 1994, &12,000
- Multipurpose Analytical System "MultiFerm" for Agriculture, Medicine, and Environment Control. Armenian Ministry of Industry, Grant # HH2-643, PI: A. Simonian, 1992-1995, \$38,000
- Flow-injection analytical system for detection of glucose, L-lysine and uric acid. Military-Industrial Commission of Soviet Ministry of USSR, Grant SM-88-132, PI – A. Simonian, 1988-1991, \$520,000

STUDENTS GRADUATED

- Garnik Khachatryan, Ph.D. "L-Lysine-2-Monooxygenase as a Biorecognition Element in Biosensors" April 1993, presently at Yerevan Physics Institute, Yerevan, Armenia
- Stepan Tatikian, Ph.D. "Amperometric Urate Oxide Sensors Based on Microbial Uricase" June 1993, presently at Yerevan Physics Institute, Yerevan, Armenia
- Irina Badalian, M.S. "Microbial Cell-based Biosensor for L-Proline Detection" July 1991, presently at Moscow State University, Moscow, Russia
- Current students: Ph.D.:S.B. Shankar Ganesh, Sheetal Paliwal, Huihua Shu, Avinash Sharma. M.S.: Srinivas Sista, Madhumati Raman than.

REFEREED JOURNAL SELECTED PUBLICATIONS

"A Fluorescence-based Biosensor for the Detection of Organophosphate Pesticides and Chemical Warfare Agents". L. Viveros, S. Paliwal, D.A. McCrae, J. Wild, and A. Simonian. *Biosensors & Bioelectronics*, 2004, *Biosensors & Bioelectronics*, submitted .

"Construction of a novel, multi-analyte biosensor system for assaying cell division: identification of cell proliferation/death precursor events". S. Kintzios, I. Marinopoulou, G. Moschopoulou, O. Mangana, K. Nomikou, K. Endo, I. Papanastasiou, **A. Simonian**. *Biosensors & Bioelectronics*, 2004, submitted.

"A FET-based Biosensor for The Direct Detection of Organophosphate Neurotoxins"
A.L. Simonian, A.W. Flounders, and J. R. Wild. *Electroanalysis*, 2004, 16, p.1896-1906.

"Nanoparticle-based Optical Biosensors for the Direct Detection of Organophosphate Chemical Warfare Agents and Pesticides" **A. L. Simonian**, T. A. Good, S.-S. Wang, and J. R. Wild. *Anal. Chim. Acta*, 2004 in press.

“An Enzyme-based Biosensors for Direct and Discriminative Detection of CW Nerve Agents and Agricultural Pesticides”, **A. Simonian** and J. Wild, a chapter in “The Science of Homeland Security- Volume One”. Invited publication, 2005, under preparation.

” Novel Biosensor for Monitoring of Food Animal Health Status” **Simonian A. L.**, Wales M. E., S. Waghela, G. Wagner, and. Wild J. R. *Sensors and Actuators, B*, 2004, under preparation.

“Study on the mechanism of BERA (Bioelectric Recognition Assay): evidence for immobilized cell membrane interactions with viral fragments” , S. Kintzios, F. Bem, O. Mangana, K. Nomikou, P., Markoulatos, N. Alexandropoulos , C. Fasseas, V. Arakelyan, A-L. Petrou, K. Soukouli, G. Moschopoulou, **A. Simonian**. *Biosensors & Bioelectronics*, 2004, Volume 20, Issue 4 , 1 November 2004, Pages 907-916.

“Control of Mammalian Cell and Bacteria Adhesion on Substrates Micropatterned with Poly(ethylene glycol) Hydrogels”, Won-Gun Koh,¹ Alexander Revzin,² **Aleksandr Simonian**,³ Tony Reeves³ and Michael Pishko*¹, *Biomedical Microdevices*, 2003, 5:1, 11-19.

“Characterization of Oxidoreductase/ Redox Polymer Electrostatic Film Assembly by Surface Plasmon Resonance Spectroscopy, FTIR, and Ellipsometry on Gold”. **A.L. Simonian**, A. Revzin, J. R. Wild, J. Elkind, and M. V. Pishko *Anal.Chim.Acta*, 2002, Vol. 466, 201-212.

“Mass Transfer in Amperometric Biosensors Based on Nanocomposite Thin Films of Redox Polymers and Oxidoreductases”, Michael V. Pishko, Alexander Revzin, **Aleksandr L. Simonian**. *Sensors*, 2002, 2, 79-90

“Glucose, Lactate, and Pyruvate Biosensor Arrays Based on Redox Polymer/Oxidoreductase Nanocomposite Thin Films Deposited on Photolithographically Patterned Gold Microelectrodes” Alexander F. Revzin, Kaushik Sirkar, **Aleksandr Simonian**, and Michael V. Pishko. *Sensors and Actuators, B*, 2002, Vol.81, pp.359-368.

“Discriminative Detection of Neurotoxins in Multi-Component Samples. **Simonian A. L.**, Efremenko E. N., and. Wild J. R. *Analytica Chimica Acta*, 2001, Vol. 444, pp 179-186.

“Enzyme-based biosensor for the direct detection of fluorine-containing organophosphates”. **A.L. Simonian**, J.K. Grimsley, A.W. Flounders J. S. Schoeniger, Tu-Chen Cheng, J.J. DeFrank and J. R. Wild. *Analytica Chimica Acta*, 2001, Vol. 442, pp 15-23.

“The Influence of External Environment Fluctuations on the Signal Formation of Microbiosensors”. V B. Arakelian, J. R Wild, and **A. L. Simonian**. *Biosensors and Bioelectronics*, 2001, Vol.16, #1, pp. 69-72

“Development of Sensors for Direct Detection of Organophosphats; Sol-Gel Modified Field Effect Transistor with Immobilized OPH”. A. Flounders, A. Singh, J. Volponi, S. Carichner, K. Wally, **A. Simonian**, J. Wild, J. Schoeniger, *Biosensors and Bioelectronics*, 1999, Vol. 14, #8-9 pp, 713-720.

“Poly(ethylene glycol) Hydrogel-Encapsulated Fluorophore-Enzyme Conjugates for Direct Detection of Organophosphorus Neurotoxines”. R. Russell, M. Pishko, **A. Simonian**, and J. Wild. *Analytical Chemistry*, 1999, Vol.71, pp.4909-4912.

“Enhancement of the Specificity of an Enzyme-based Biosensor for L-Tryptophan” **A. L. Simonian**, E. I. Rainina, P. F. Fitzpatrick, and J. R Wild. “*Tryptophan, Serotonin, Melatonin – Basic Aspects and Applications*”, Edited by Gerald Huether, Walter Kochen, Thomas J. Simat, Hans Steinhart, Kluwer Academic/Plenum Publishers, Series: Advances in Experimental Medicine and Biology, New York and London, 1999, pp 833-840.

“An Enzyme Based Biosensor for Direct Determination of Diisopropyl fluorophosphate” **A. L. Simonian**, B. D. DiSioudi, and J. R. Wild., *Anal. Chim. Acta*, 1999, Vol. 389, No.1-3, pp. 189-196.

“Investigation of Stochastic Fluctuations in the Signal Formation of Microbiosensors” V B. Arakelian, J. R Wild, and **A. L. Simonian**. *Biosensors and Bioelectronics*, 1998, Vol. 13, No.1, 55-59.

"New Concept for Discriminative Biosensor: Detection of Organophosphates in the Presence of Other Cholinesterases Inhibitors" **A. L. Simonian**, E. I. Rainina, and J. R Wild. *Analytical Letters*, 1997 30(14), 2453-2468.

“A Tryptophan-2-monooxygenase Based Amperometric Biosensor for L-tryptophan Determination. Use of a Competitive Inhibitor as a Tool for Selectivity Increase”. **A. L. Simonian**, E. I. Rainina, P. F. Fitzpatrick, and J. R Wild. *Biosensors and Bioelectronics*, 1997, Vol. 12, No.5 pp.363-371.

"The Development of a New Biosensor Based on Recombinant *E.coli* for the Detection of Organophosphorous Neurotoxins" E.Rainina , **A.Simonian** , A.Efremenco, S.Varfolomeyev and J.Wild , *Biosensors and Bioelectronics*, 1996. Vol. 11, No 10, pp. 991-1000.

"Cell Biosensor for Assay Phenol in Aqueous Solutions". E.I.Rainina, I.E.Badalian, O.V.Ignatov, A.S.Fedorov, **A. L. Simonian**. *Applied Biochemistry and Biotechnology*, 1996. V. 55, No 1. 117-127.

"A Biosensor for L-Tryptophan Determination Based on Recombinant *Pseudomonas savastanoi* Tryptophan-2-Monooxygenase". **A. L. Simonian**, E. I. Rainina, J. R Wild, P. F. Fitzpatrick. *Analytical Letters*, 1995, Vol. 28, No. 10, pp. 1751 - 1761.

"Flow-Injection Amperometric Biosensor Based on Immobilized L-Lysineoxidase for L-Lysine determination" **A. L. Simonian**, I. E.Badalian, T. T.Berezov, I. P.Smirnova, S. H.Khaduev. *Analytical Letters*, 1994, V.27(15), pp. 2849 - 2860.

"L-Lysine-2-monooxygenase Production by Some Strains of *Pseudomonas Fluorescens* and *Pseudomonas Putida* Species. G. E.Khachatryan, **A. L. Simonian**. *World Journal of Microbiology&Biotechnology*. 1994. V.10, No. 6, pp. 711-712.

"A Biosensor for L-Proline Determination by Use of Immobilized Microbial Cells". **A.L.Simonian**, I.E.Badalian, G.E.Khachatrian, S.Sh.Tatikian, E.I.Rainina, T.A.Makhlis, V.I.Loizinsky, S.D.Varfolomeyev. *Applied Biochemistry and Biotechnology*, 1992. Vol. 36, pp. 199-210.

"Metabolite Alternative Splitting by Different Enzymes." **A. L. Simonian**, I.E.Badalian, Smirnova I.P., Berezov T.T. *Biochemical Engineering-Stuttgart*. Editor M.Reuss. G.Fisher Pub., Stuttgart-New York, 1991. pp. 344-347.

"A Flow-Through Enzyme Analyzer for Determination of L-Lysine Concentration". *Biosensors and Bioelectronics*, 1991. **A. L. Simonian**, G.E.Khachatrian, S.Sh.Tatikian, Ts.M.Avakian, I.E.Badalian. Vol.6, No. 2, pp. 93-99.

"Kinetic Properties of Bacterial Urate Oxidase Entrapped in Hydrated Reversed Micelles" E.A.Malakhova, N.A.Chebotareva, B.I.Kurganov, **A. L. Simonian**. *Biological Membranes* (Russian). 1991. Vol.8, No.5, pp.453-459.

"Incorporation of Water-Soluble Enzymes Glucoseoxidase and Urate Oxidase Into Lecithin Liposomes". T.G.Ambartzumyan, S.Ja.Adamian, L.S.Petrosian, **A. L. Simonian**. *Biological Membranes* (Russian). 1991. Vol.8, No.12, pp.1254-1259.

"Kinetic Properties and Termoinactivation of Bacterial Uricas". **A. L. Simonian**, S.Sh.Tatikian, J.J.Kulys. *Biochemistry* (Russian). 1985. Vol. 50, No. 5, pp.782-785.

"Determination of Uric Acid in Biological Solution Using Bienzyme Electrode". J.J.Kulys, M.V.Pesliakene, V.A.Laurinavicus, S.Sh.Tatikian, **A. L. Simonian**. *Journal of Analytical Chemistry* (Russian). 1985. Vol.XL, No 11, pp.2077-2080

"Application of immobilized glucose oxidase and urat oxidase in analytical systems". **A. L. Simonian**, S.Sh.Tatikian, G. Khachatryan. *Applied Biochemistry and Microbiology* (Russian), 1986, Vol. 12 (6) pp. 675-679.

REVIEW ARTICLES AND BOOK CHAPTERS

"Microbial Biosensors Based on Potentiometric Detection" **A. Simonian**, E. Rainina, and J. Wild, *"Enzyme and Microbial Biosensors. Techniques and Protocols"*, A. Mulchandani and K. Rogers Eds., Humana Press (Totowa, New Jersey), 1998, 237-248.

"Flow-Injection Analytical System Based on Column Mini-Reactors". **A. L. Simonian**. In Monograph *"Biotechnics - a Novel Strategy of Computerization"* (Russian) 1991. Ed.Yu.Akhapkin, S.I.Barstev et al. Moscow, Nauka, pp.87-95.

"Enzyme-based Analytical System in Analytical Practice – Reality and Perspectives. **A. L. Simonian**, and E. M. Akopyan, Review Information Series, USSR Ministry of Medical and Biotechnological Industry, Moscow, 1990.

ISSUED PATENTS (USSR)

“Method of L-proline quantitative determination”. **Simonian, Aleksandr Lyudvigovic**; Rainina, Evgeniya I.; Badalyan, Irina Emilevna; Makhlis, Tatyana A.; Tatikyan, Stepan Shagenovich; Khachatryan, Garnik Eduardovich. Russ. Patent (1997), CODEN: RUXXE7 RU 2086652 C1 19970810 CAN 128:86154 AN 1998:76544

“The method for uric acid concentration determination”, J.J.Kulys, M.V.Pesljakene, V.A.Laurinavichus, **A. L. Simonian**, G.E.Khachatrian, S.Sh.Tatikian, Ts.M.Avakian. *USSR Patent # 1236378*, February 8, 1986.

“Pseudomonas Putida VKM B-1458 - a new strain-producer of L-lysine-2-monooxygenase” **A.L.Simonian**, G.E.Khachatrian, S.Sh.Tatikian, Ts.M.Avakian, G.E.Khachatrian. *USSR Patent # 1310427*, May 12, 1986.

“The method of L-lysine concentration determination”, **A.L.Simonian**, G.E.Khachatrian, S.Sh.Tatikian, Ts.M.Avakian, *USSR Patent # 1387417*, June 5, 1987.

“Bacillus Fastidiosus strain - producer of urate oxidase” I.B.Seiranian, E.G.Afrikan, **A.L.Simonian**, S.Sh. Tatikian, N.I.Mkrtchian, Ts.M.Avakian. *USSR Patent #1482196*, January 22 1989.

INVITED PRESENTATIONS

"Surface Plasmon Resonance Biosensing Technology: A Real-time Tool for the Detection of Food Contaminants". Aleksandr L. Simonian, ANNUAL MEETING OF THE SOUTHEASTERN BRANCH OF THE AMERICAN SOCIETY FOR MICROBIOLOGY OCTOBER 21-23, 2004, Jacksonville, AL.

“Nanoparticles-based Biosensor for Direct Detection and Discrimination of Organophosphate CW Agents and Pesticides”, **A. Simonian**, T. Good, S.-S. Wang, A. Sharma, and J. Wild. DHS 2nd Joint Conference on Point Detection, 1-5 March 2004 in Williamsburg, VA.

“Utilization of Surface Enhanced Fluorescence for Direct Detection of Organophosphate Chemical Warfare Agents and Neurotoxic Pesticides”. **Alex Simonian**, Auburn University; Theresa Good, University of Maryland Baltimore, Steven Wang, Texas A&M University; James Wild, Texas A&M University. FACSS The 30th Annual Meeting: Ft. Lauderdale, FL October 2003.

“Gold Nanoparticles-based Biosensor for Detection of Organophosphate Neurotoxins” **A. Simonian**, T. Good, S. Wang, and J. Wild. BMES 2003 Annual Fall Meeting, Nashville TN, October, 2003.

SPR Spectrometry as an Effective Biosensor Platform. **A. Simonian**. AU Chemistry Department Divisional Seminar, December 11, 2003.

“Highly discriminative biosensors for organophosphate neurotoxins detection” Gordon Research Conference “Bioanalytical Sensors”, **A.L. Simonian** Ventura, California, March 10-15, 2002

A.L.Simonian “Application of SPR Spectroscopy for Biosensors Development” Texas Instruments, December 18, 2000. Host – Jerry Elkind.

A.L.Simonian “Biosensors for OP Neurotoxins Direct Detection” IGEN International, June 2000.

A.L.Simonian “Biosensors: from simple idea to great analytical tools” NIH seminar, LPSB, Bethesda, 12.09.97. Host – Adrian Parsegian.

PRESENTATIONS

“Prevention of Non-specific binding as a Way to Increase Sensitivity of SPR-based Biosensors” S.B.Shankar Ganesh, Valery A. Petrenko, & **Aleksandr L.Simonian**. AECS 206th Meeting, Honolulu, Hawaii, October 3-8, 2004

“Comparison of Optical and Acoustic Wave Phage Biosensors” , Viswaprakash Nanduri, Alexander M. Samoylov, Valery A. Petrenko, Vitaly Vodyanoy, and **Aleksandr L. Simonian**. AECS 206th Meeting, Honolulu, Hawaii, October 3-8, 2004

“Surface Plasmon Resonance Spectroscopy for the Specific Near-Real Time Detection of *Staphylococcus aureus*”, Srinivas Sista, Tuang S. Huang, and **Aleksandr L. Simonian**. AECS 206th Meeting, Honolulu, Hawaii, October 3-8, 2004

[“Construction of a novel multi-analyte biosensor system for assaying cell division”](#) S Kintzios, Y Marinopoulou, G Moschopoulou, **A Simonian**, Biosensors 2004, Granada, Spain, May 24-26, 2004.

Alex Simonian, T. Good, S.-S. Wang, A. Sharma, and J. Wild. “Nanoparticles-based Biosensor for Direct Detection and Discrimination of Organophosphate CW Agents and Pesticides”, DHS 2nd Joint Conference on Point Detection, 1-5 March 2004 in Williamsburg, VA.

Sh. Palival and **A. Simonian**, A Nerve Agent Biosensor with Near Real Time Detection. AU Graduate Student Council Forum, March 3, 2004.

Alex Simonian, “SPR Spectrometry as an Effective Biosensor Platform”. AU Chemistry Department Divisional Seminar (E. Bakker), December 11, 2003.

Alex Simonian, T. Good, S. Wang, and J. Wild. “Gold Nanoparticles-based Biosensor for Detection of Organophosphate Neurotoxins” BMES 2003 Annual Fall Meeting, Nashville TN, October, 2003.

L. K. Viveros, Sh. Paliwal, and **A. L. Simonian**. Enzyme-based Fiber Optic Detection of Organophosphates. AUDF Meeting, September 23, 2003.

S.B. Ganesh, S.Sista, V. Petrenko, V. Vodyanoy, and **A. Simonian**
Characterization of Protein Binding on Phage Bio-probe by Surface Plasmon Resonance.
AUDF Meeting, September 23, 2003

“Gold nanoparticles-based monitoring of enzyme kinetic: Direct Detection of Organophosphate Chemical Warfare Agents and Neurotoxic Pesticides” , authors: **A. Simonian**, T. Good, S.-S. Wang, and J. Wild, **Invited Presentation**, Federation of Analytical Chemistry and Spectroscopy Societies (FACSS) Meeting, Ft. Lauderdale, FL, October 2003

A. Simonian, “Development of Biosensors for BW Real-time Monitoring”. DOD USAMRMC Consensus Conference on the Role of Biosensors in the Early Detection of Agents of Bioterrorism. September 2003

“BERA (Bioelectric Recognition Assay): A universal System for Detecting Viruses and Evaluating Antiviral Agents”, S. Kintzios, E. Pistola, J. Konstas, Th. Matakadiadis, O. Mangana, K. Nomikou, P., Markoulatos, N. Alexandropoulos ,C.P. Yialouris, A. B. Sideridis, F. Fish, A. Shafran, I. Levitan, A. Kaftory, A-L. Petrou, , V. Arakelyan, **A. L. Simonian**, Biosensors 2002, Kyoto, Japan, May 15-17, 2002.

“Amperometric Biosensors Based on Nanostructured Redox Polymer Thin Films” Revzin, A., Simonian, A.L., Pishko M.V. Oral Presentation, The 201st Meeting of the Electrochemical Society, Philadelphia, PA, May 2002.

“Optimization of Assembly of Redox Polymer/Oxidoreductases Nanocomposite Films Used for Biosensor Applications”, **A. Simonian**, A. Revzin, J. Wild, J. Elkind, and M. Pishko, Biosensors 2002, Kyoto, Japan, May 15-17, 2002.

“Highly Specific Detection and Discrimination Between Different Classes of Neurotoxins by Enzyme-Based Biosensors”, **A.L. Simonian**, M.V. Pishko, and J. R. Wild, Biosensors 2002, Kyoto, Japan, May 15-17, 2002.

“How an Environmental Multiplicative Noise Influence on the Signal Formation of Microbiosensors”, V. B. Arakelian^{1*}, H. V. Arakelian³, J. R. Wild², and **A. L. Simonian**, Biosensors 2002, Kyoto, Japan, May 15-17, 2002.

“Highly discriminative biosensors for organophosphate neurotoxins detection” Gordon Research Conference “Bioanalytical Sensors”, Ventura, California, March 10-15, 2002.

“Assembly and Response of Nanostructured Amperometric Biosensors for Glucose, Lactate and Pyruvate Detection ” Revzin, A., **Simonian, A.**, DeCormier, A., Pishko, M.V. Oral Presentation, AIChE meeting, Reno, Nevada, November 2001.

“A Novel Biosensor for Intravascular Monitoring of Infectious Disease Agents” **A. Simonian**. Gordon Research Conference “ Illicit Substance Detection, June 24 to 29, 2001, Mount Holyoke College, South Hadley, Massachusetts.

“A Biosensor for the Direct Detection of Fluorine Containing Nerve Agents” **A.L. Simonian**, J.K. Grimsley, A.W. Flounders J. S. Schoeniger, Tu-Chen Cheng, J.J. DeFrank and J. R. Wild. International Symposium on Application of Enzymes in Chemical and Biological Defense, Orlando, Florida, May 13-18, 2001.

“Enzyme Based Biosensor Can Discriminate Between Different Classes of Inhibitors and Heavy Metal Ions in Multiple Contaminated Samples”, **Simonian A. L.**, Efremenko E. N., and Wild J. R. International Symposium on Application of Enzymes in Chemical and Biological Defense, Orlando, Florida, May 13-18, 2001.

“Amperometric Biosensors Based on Nanostructured Redox Polymer Thin Films” A. Revzin, **A. Simonian**, A. DeCormier, K. Sirkar and M. V.Pishko, ECS199th Meeting - Washington, D.C. March 25-30, 2001.

“Amperometric Biosensors Based on Nanostructured Redox Polymer Thin Films” Revzin, A., Simonian, A., DeCormier, A., Sirkar, K., Pishko, M.V. Oral Presentation, 199th Meeting of the Electrochemical Society, Washington D.C., March 2001.

“Redundant Amperometric Biosensors Based on Redox Polymer/Oxidoreductase Nanocomposite Thin Films Deposited on Photolithographically Patterned Gold Electrodes” Revzin, A., Simonian, A., Pishko, M. Oral Presentation, 19th Annual Houston Conference on Biomedical Engineering Research, Houston, Texas, February 2001.

“Application of SPR Spectroscopy for Monitoring of Food Animal Health Status” **A. L. Simonian**, Texas Instruments Seminar, Dallas, December 14 2000.

“An Enzyme Biosensors for Direct Detection of Organophosphates”. The Six World Congress on Biosensors, San Diego (USA), May 2000. **A. L. Simonian**, A. W. Flounders, J. S. Schoeniger, E. I. Rainina, M. V. Pishko and J. R. Wild

“Development of Organophosphate Hydrolase Enzyme Array Sensor: Testing with Engineered Mutant Enzymes and pF Sensitive Field Effect Transistors”. The Six World Congress on Biosensors, San Diego (USA), May 2000. A.W. Flounders*, R. P. Janek, **A. L. Simonian**, J. R. Wild, J.S. Schoeniger.

“Enzyme Based Biosensor for Discrimination of Neurotoxins in Multi-pollutant Samples”. The Six World Congress on Biosensors, San Diego (USA), May 2000. **Simonian A. L.**, Efremenko E. N., Rainina E. I., J. K. Grimsley, and Wild J. R.

“OPH Based Biosensors: Unique Capabilities for Recognition and Discrimination of OP Neurotoxins”. NATO-ASI, Bergen Dal (The Netherlands) June 1999. **A. L. Simonian**, E. I. Rainina, A.W. Flounders, J. S. Schoeniger, J. K. Grimsley, and J. R. Wild.

“Enzyme Based Biosensor for the Direct Detection and Discrimination of Organophosphate Neurotoxins”, The Pittsburgh Conference’99 (PITTCO’99) March 1999. **A. L. Simonian**, E. I. Rainina, A.W. Flounders, J. S. Schoeniger, J. K. Grimsley, and J. R. Wild.

“An Enzyme-based Approach for the Discrimination Between CW Agents and Common Agricultural Pesticides” **A.L.Simonian** et al. 6th International Symposium on Protection Against Chemical and Biological Warfare Agents. Stockholm, Sweden, May 10-15, 1998.

“A Biosensor for L-Tryptophan Reagentless Determination”. **A.L.Simonian**. Tryptophan – Basic aspects and Practical Applications. 9th International Meeting on Tryptophan Research, October 10-14, 1998, Hamburg, Germany.

“An Integrative Enzyme Biosensor for the Discrimination of OP Neurotoxins” **Simonian A.** et al., 1997 Gordon Research Conference on Bio/Analytical Sensors, “From the Inspection of an Idea to Bringing a Sensors to Market” July 27 - August 1, 1997, New England College - Henniker, New Hampshire

“Monooxygenases/Oxidases Based Biosensors for Amino Acid Determination”. **A. L. Simonian**, 1997 Gordon Research Conference on Bio/Analytical Sensors, “From the Inspection of an Idea to Bringing a Sensors to Market” July 27 - August 1, 1997, New England College - Henniker, New Hampshire

“A new approach to CW agent detection: potentiometric microbial- and enzyme based biosensors for the direct quantitation of organophosphorus neurotoxins”. **Simonian A.** et al. Abstract book 213th ACS National meeting, San Francisco, 1997.

“A Biosensor for L-Tryptophan Specific Determination”. Simonian A. et al. Abstract book 213th ACS National meeting, San Francisco, 1997.

“Enzyme Based Biosensor for Direct Detection of Organophosphate Neurotoxins”, **A. Simonian**, E. Rainina, J. Grimsley, and J. Wild. Society of Toxicology 35th Annual Meeting, Anaheim, March 1996, p. 26.

“Potentiometric Biosensor for Organophosphorus Neurotoxines Quantification” **Simonian A.** et al. Abstract book NATO Workshop “Chemical and Biological Technology for the Detection, Destruction and Decontamination of Chemical Warfare Agents”. 1996, Moscow, Russia.

“Biosensors for Direct Determination of Organophosphorus Neurotoxines”. **Simonian A.** et al. International Workshop “Biocatalytic Degradation of Chemical Warfare Related Materials”. 1995, Edgewood, USA.

"Multipurpose Flow-Injection Analytical System Based on Immobilized Enzymes and Cells". **A.L.Simonian**. Abstract Book of International Congress "Biosensor 94", New Orleans, 1994, p.18.

"Immobilized Microbial Cells Based Flow-Injection Biosensors for L-Proline Determination". I.E.Badalian, T.A.Makhlis, E.I.Rainina, **A.L.Simonian**, S.D.Varfolomeyev. Abstract Book of International Congress "Biosensor 94", New Orleans, 1994, p.32.

"Bacterial Uratoxidase-based Biosensor for Uric Acid Determination" S.Sh.Tatikian, **A.L.Simonian**. Abstract Book of International Congress "Biosensor 94", New Orleans, 1994, p.20.

"Use of the Principle of Substrate Parallel Splitting in Flow-Injection Biosensors". **A.L.Simonian**. Abstract Book of International Congress "Biosensor 94", New Orleans, 1994, p.19.

"Cellsors: Biosensors on Cryoimmobilized Cells". Varfolomeyev, S., Rainina, E, and **Simonian A.** Abstract Book of International Congress "Biosensor 94", New Orleans, 1994.

"Multipurpose biosensor for of environmental control". **Simonian A.** et al. VI European Congress in Biotechnology, Ferenze, Italy, 1993.

"Flow-Injection Analytic System for D-Glucose Determination". **A.L.Simonian**. Abstract Book of International Symposium on Biosensors. Moscow, 1992, p.11.

"Estimation of naturalness of grape wines and honey by use of a biosensor to L-proline". **Simonian A. L.**, Badalian I.E., Rainina E.I., Makhlis T.A., Loziinsky V.I. Abstract book of 15th International Congress of Biochemistry, Jerusalem, 1991, p.95.

"Determination of Ethanol Concentration Employing Yeast *Candida Boidini* Immobilized in Polyvinyl Alcohol Criogel" **A.L.Simonian**, I.E.Badalian, T.A.Makhlis, I.M.Arzukevich, E.I.Rainina. Abstract Book of 15th International Specialized Symposium on Yeast, 1991, Riga, p.130

"Column Mini-Reactor-Based Enzyme Analyzers of Metabolites" **A.L.Simonian** Abstract Book of International Symposium on Bioanalytical Methods. Prague, 1990, p.28-29.

"Multipurpose analyzer "ARFA" in Clinical Investigation and Microbiological Industry" S.Sh.Tatikian, G.E.Khachatryan, Ts.M.Avakian, I.E.Badalian, **A.L.Simonian**. Abstract Book of International Symposium on Bioanalytical Methods. Prague, 1990, p.65.

"Specific and Rapid Determination of L-Lysine Concentration by Flow-Through Enzyme Analyzer". **A.L.Simonian**, G.E.Khachatryan, S.Sh.Tatikian, Ts.M.Avakian. Abstract Book of FEBS 19th Meeting, Rome, 1989, p.TU482.