Sergej V. Aksenov

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Department of Anatomy
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Education:

Ph.D. in Biophysics
Moscow State University, Moscow, Russia
February 1997 to October 1999
Thesis: Mathematical modelling of the genetic regulatory circuit for the SOS response in Escherichia coli (advisor Prof. E. A. Krasavin)

Diploma in Radiation Biophysics and Ecology
Moscow Engineering Physics Institute, Moscow, Russia
September 1990 to February 1997
Relevant courses: Mathematics, Probability Theory, Statistical Physics, Quantum Mechanics, Physical Chemistry, Biochemistry, Molecular Biology

Employment and research experience:

Research Associate
With Dr. Dennis Bray
Department of Zoology; Department of Anatomy, University of Cambridge, Cambridge, UK
July 2002 to present
Research areas: modelling of signal amplification, noise attenuation and integration of multiple signals by cooperative clusters of bacterial chemotaxis receptors

Research Fellow
With Prof. Michael A. Savageau
Department of Microbiology and Immunology, The University of Michigan, Ann Arbor, USA
July 1999 to July 2002
Research areas: modelling architecture and function of elementary signal transduction modules based on covalent modification; properties of statistical Zipf and S distributions; calculation of Lerch's transcendent (with Dr. Ulrich Jentschura)

Research Assistant
With Prof. Eugene A. Krasavin
Department of Radiobiology, Joint Institute for Nuclear Research, Dubna, Russia
February 1997 to October 1999

Research areas: modelling gene regulatory network for the DNA damage response in Escherichia coli; mathematically controlled comparisons of two- and one-level designs of cascaded gene regulatory circuits (with Dr. William S. Hlavacek)

Laboratory Assistant
With Dr. Stanislav Kozubek
Laboratory of Molecular Cytology and Cytometry, Institute of Biophysics, Brno, Czech Republic
August 1995 (while a student from September 1990 to February 1997)
Research area: computer processing of fluorescence microscope-derived images of nuclei of human lymphocytes after ionizing irradiation

Laboratory Assistant
With Dr. Alexander Litvin
Laboratory of Neutron Physics, Joint Institute for Nuclear Research, Dubna, Russia
June 1991 to December 1991 (while a student from September 1990 to February 1997)
Research area: computer programming of the solution of ordinary differential equations describing the gene regulatory system for DNA damage response in Escherichia coli

Teaching experience:

Undergraduate Supervisor
Quantitative Biology (Part 1A of the Natural Sciences Tripos)
Magdalene College, University of Cambridge, Cambridge, UK
October 2003 to present
Course covers: Dynamics of populations, Compartmental analysis, Statistics, Bioinformatics

Publications:

Shimizu, T. S., **Aksenov, S. V.,** Bray, D., 2003, A spatially extended stochastic model of the bacterial chemotaxis signalling pathway, *Journal of Molecular Biology*, 329, 291-309.

Aksenov, S. V., Savageau, M. A., Jentschura, U. D., Becher, J., Soff, G., Mohr, P. J., 2003, Application of the combined nonlinear-condensation transformation to problems in statistical analysis and theoretical physics, *Computer Physics Communications*, 150, 1-20.

Aksenov, S. V., Savageau, M. A., 2002, Parameter estimation and random number generation from a Zipf-related Lerch distribution, *Communications in Statistics - Theory and Methods*, submitted.

Aksenov, S. V., Savageau, M. A., 2001, Statistical inference and modelling with the S distribution, e-print arXiv: physics/0112046 (http://arxiv.org/).

Aksenov, S. V., 1999, Induction of the SOS response in ultraviolet-irradiated Escherichia coli analyzed by dynamics of LexA, RecA and SulA proteins, *Journal of Biological Physics*, 25, 263-277.

Aksenov, S. V., 1999, Dynamics of the inducing signal for the SOS regulatory system in Escherichia coli after ultraviolet irradiation, *Mathematical Biosciences*, 157, 269-286.

Aksenov, S. V., Krasavin, E. A., Litvin, A. A., 1997, Mathematical model of the SOS response regulation of an excision repair deficient mutant of Escherichia coli after ultraviolet irradiation, *Journal of Theoretical Biology*, 186, 251-260.

Presentations:

September, 2003, Decision-making in bacterial chemotaxis, Launch workshop of the EPSRC cluster on Molecular and Cellular Computing, University of Exeter, Exeter, UK (joint work with D. Bray).

May, 2003, Computer-based analysis of a simple signalling pathway, Interdisciplinary meeting on "Channels, Receptors and Signalling", Mathematics Institute, University of Warwick, Coventry, UK (joint work with D. Bray).

September, 2000, A comparative study of signal transduction modules involving cyclic covalent modification, VI International symposium on "Biochemical systems theory", Puerto de La Cruz, Tenerife, Spain (joint work with M. A. Savageau).

May, 1999, Dynamics of induction of the SOS proteins in Escherichia coli after ultraviolet irradiation, International conference "Lomonosov-99", Moscow State University, Moscow, Russia (joint work with E. A. Krasavin).

January, 1999, Modeling signal dynamics for the LexA-RecA regulatory system, III Scientific conference of young scientists, Dubna, Russia (joint work with E. A. Krasavin).

October, 1998, Functional implications of design differences between one- and two-step cascaded genetic regulatory circuits, International symposium on "Power-law modeling of biological systems", Oeiras, Portugal (joint work with W. S. Hlavacek).

June, 1998, Modeling regulation of the SOS response in Escherichia coli bacteria, International conference "Nonlinear phenomena in biology", Puschino, Russia (joint work with E. A. Krasavin).

August, 1997, Mathematical model of the SOS response regulation in Escherichia coli, International conference "Deterministic and stochastic modeling of biointeraction", Sofia, Bulgaria (joint work with E. A. Krasavin).

January, 1997, Model for the genetic regulatory system for the SOS response in Escherichia coli, International symposium on "Problems of biochemistry, radiation and space biology", Moscow-Dubna, Russia (joint work with E. A. Krasavin).

June, 1996, Regulation of the SOS response by LexA-RecA interaction, Workshop on "Modern problems in radiobiology", Dubna, Russia (joint work with E. A. Krasavin and A. A. Litvin).

Membership:

Society for Mathematical Biology
1998 to present