

Konstantin Severinov, Ph.D., D.Sc.

Professor

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PERSONAL INFORMATION

Date and place of birth: December 12, 1967, Leningrad, USSR
Citizenship: USA, Russia

EDUCATION

M. S., with high honors, 1990 Biological Faculty, Department of Molecular Biology,
Moscow State University, USSR
Ph. D., 1993 Institute of Molecular Genetics, Russian Academy
of Sciences, Moscow, Russia

PROFESSIONAL POSITIONS HELD

2015 – present Director of Skoltech Center for Data Intensive
Biomedicine and Biotechnology
2014 - present Director of Skoltech BMT educational program
2013 - 2015 Head of Laboratory of molecular microbiology, St.
Petersburg State Polytechnical University, St.
Petersburg, Russia
2013 - present Professor, Skolkovo Institute of Technology,
Skolkovo, Russia
2012 - 2013 Founding faculty fellow, Skolkovo Institute of
Technology, Skolkovo, Russia
2010 - present Head of Laboratory of regulation of gene expression
of prokaryotic mobile genetic elements, Institute of
Molecular Genetics, Russian Academy of Sciences,
Moscow, Russia
2007 - present Head of Laboratory of molecular genetics of
microorganisms, Institute of Gene Biology, Russian
Academy of Sciences, Moscow, Russia
2006 - 2009 Senior Lecturer, Department of Molecular Biology,
Faculty of Biology, Moscow State University,
Moscow, Russia
2005 - present Professor, Waksman Institute, Department of
Molecular Biology and Biochemistry, Rutgers
University, Piscataway, NJ
2005 - 2010 Group Leader, Institute of Molecular Genetics,

Russian Academy of Sciences, Moscow, Russia

2002 - 2005 Associate Professor, Waksman Institute, Department of Molecular Biology and Biochemistry, Rutgers University, Piscataway, NJ

2002 Associate Professor, Waksman Institute, Department of Genetics, Rutgers University, Piscataway, NJ

1997 - 2002 Assistant Professor, Waksman Institute, Department of Genetics, Rutgers University, Piscataway, NJ

1994 - 1997 Postdoctoral Fellow, the Rockefeller University, New York, NY (advisor S. A. Darst)

1992 - 1994 Research Scientist, Public Health Research Institute, New York, NY

1991 - 1992 Research Associate, Department of Microbiology, Columbia University, New York, NY

1990 - 1993 Graduate Student, Institute of Molecular Genetics, Moscow, Russia (advisors V. Nikiforov and A. Goldfarb)

1989 – 1990 Staff Associate, Institute of Protein Research, Pushchino, USSR

AWARDS AND HONORS

2010	Professor of Molecular Genetics, Russian Academy of Sciences
2010	Fulbright Senior Scholar
2009	Fellow of American Academy of Microbiology
2008, 2009	The Russian Science Support Foundation Prize
2006	D. Sc., Russian Academy of Sciences
2004	Invited participant, Advanced Systems Concepts Office of the Defense Threat Reduction Agency Bacteriophage Workshop
2002	National Research Council Exchange Fellowship with All-Russian State Center for Applied Microbiology, Obolensk, Russia
2001	Participant, National Research Council Exchange Program with former Russian Bioweapons Institutes
1997	10th Johnson & Johnson Discovery Award
1996 - 2002	The Burroughs Wellcome Fund Career Award in the Biomedical Sciences
1994 - 1997	The Jane Coffin Childs Memorial Fund for Medical Research postdoctoral fellowship
1994	NIH postdoctoral fellowship (declined)
1991	The Soros Foundation-USSR studentship
1990	The British Council scholarship

GRANT SUPPORT (PI)

Burroughs Wellcome Career Award in Biomedical Sciences, 09/01/96-08/31/08

NIH R01 GM59295 Genetics and biochemistry of RNA polymerase assembly, 05/01/99-04/30/04

March of Dimes Birth Defects Foundation research grant Molecular architecture of RNA polymerase from yeast, 06/01/99-5/31/02

DHHS USDH Biotechnology Engagement (BTEP) grant #9 (with Dr. T. Gabisonia, Eliava Institute, Tbilisi, Georgia) Genomic and biochemical analysis of bacteriophage infection, 10/01/01-09/31/04

NRC/DTRA fellowship for scientific exchange with Russian Microbiological Institutes, 05/01/02-01/31/2004

NIH R01 GM64530 Structure-based mutational analysis of RNA polymerase, 07/01/02-01/31/07

CRDF/GRDF Georgian-U.S. Bilateral Grants Program grant #12191 (with Dr. T. Gabisonia, Eliava Institute, Tbilisi, Georgia). Creation of the treatment and prophylactic phage preparation against pathogenic *E. coli* in animals, from 03/01/03-09/01/04

CRDF grant (with Dr. T. Gabisonia, Eliava Institute, Tbilisi, Georgia) Polyvalent bacteriophage preparation as an effective remedy against massive outbreaks of antimicrobial-resistant salmonellosis, 09/01/03-12/01/04

NIAID developmental grant 1 U54 AI57158 New targets for selective therapeutics to *B. anthracis*, Northeast Biodefense Center Research Center of Excellence in Biodefense and Infectious Diseases, 10/01/03-02/28/05

NIH R01 GM59295 Modifications of host RNA polymerase during bacteriophage development, 05/01/04-04/30/09

DHHS USDH Biotechnology Engagement (BTEP) grant #384 (with Drs. T. Gabisonia, Eliava Institute, Tbilisi, Georgia and Ian Molineux, University of Texas, Austin) Validating the phage therapy concept as an alternative to antibiotic therapy using cow mastitis model, 5/01/04-12/31/06

NIH FIRCA Research grant R03 TW006828, Structure-function of RNAP inhibitor Microcin J25, 09/01/04-08/31/07

NIH FIRCA Research grant R03 TW07145, Regulation of restriction-modification genes expression, 09/01/05-08/30/08

Society of General Microbiology 2005 International Research grant, The molecular mechanism of transcription regulation of the LlaII restriction-modification system

Nuclear Threat Initiative Inc. grant, Research and development of production methods to establish a recombinant enzymes molecular biology laboratory, 04/01/06-03/31/08

Rutgers University Technology Commercialization Fund grant, Susceptibility testing of novel antibacterials-genetically improved microcins, 07/01/06-03/31/07

NIH R01 GM64530 Structure-based mutational analysis of RNA polymerase, 02/01/07-01/31/11

Russian Academy of Sciences Presidium Program in Molecular and Cellular Biology New Groups grant, Genomic, genetic, biochemical, and proteometric investigation of the process of bacteriophage infection, 01/01/07-12/31/08

Kazakhstan National Biotechnology Center grant, Preparation of recombinant AMV reverse transcriptase for use in diagnostic applications, 05/01/07-12/31/09

Russian Foundation for Basic Science Research grant, Genomic and biochemical analysis of gene expression of *Thermus* bacteriophage ϕ YS40, 05/01/07-04/30/10

NIAID Developmental grant Novel microcin C-based inhibitors of pathogenic bacteria, Northeast Biodefense Center Research Center of Excellence in Biodefense and Infectious Diseases, 3/01/07-02/29/09

Russian Academy of Sciences Presidium Program in Molecular and Cellular Biology grant, Genomic, genetic, biochemical, and proteometric investigation of the process of bacteriophage infection, 01/01/09-12/31/13

NIH R01 GM59295 Modifications of host RNA polymerase during bacteriophage development, ARRA supplement, 09/30/09-08/31/10

Russian Foundation for Basic Science Applied Research grant, Creation and use of novel Microcin C-based antibacterial compounds, 09/01/09-04/30/12

Dynasty Foundation grant, Creation of a practical laboratory course center at the Institute of Gene Biology, 12/01/09-12/31/12

Rutgers University Technology Commercialization Fund grant, Susceptibility testing of synthetic antibacterials compounds based on microcin C, 05/01/10-03/31/11

Dynasty Foundation grant, Support of young scientists participating in the Russian Academy of Sciences Presidium Cell and Molecular Biology Program (50 stipends for a total of \$300,000), 5/01/10-4/30/11

Federal Program “Professional Cadre of Innovative Russia” State Contract #02.740.11.0771, 01/01/10-12/31/12

Russian Nanotechnology Corporation grant, Development and approbation of laboratory-based educational course in bionanotechnology, 06/01/10-09/01/11

NIH R01 GM59295 Modifications of host RNA polymerase during bacteriophage development, 08/01/10-07/31/14

Dynasty Foundation grant, Introducing experimental biology in Russian high schools, 11/01/10-6/01/11

Russian Foundation for Basic Science Research grant, Function, regulation and evolution of CRISPR/Cas loci in *E. coli*, 05/01/11-04/30/14

NIGMS collaborative supplement for R01 GM59295 (with Satish Nair, UIC), 05/01/11-04/30/12

Busch Biomedical Research grant, Functional and structural analysis of an RNA polymerase of a novel class, 07/01/11-06/30/12

Federal Program “Professional Cadre of Innovative Russia” State Contract #2011-1.2.1-305-030-010, 10/01/11-09/30/13

Open Education Foundation grant, Independent research projects by high school students in a molecular biology laboratory, 02/01/12-01/31/13

Russian Academy of Sciences Presidium Program in Nanotechnology grant, Targeted delivery of toxic aminoacyl adenylates by modification of peptide part of microcin C, its derivatives, and homologs, 01/01/12-12/31/14

NIH R01 GM10407 Small RNA-based adaptive bacterial immunity, 02/01/13-01/31/17

Open Education Foundation grant, Independent research projects by high school students in a molecular biology laboratory, 03/01/13-02/28/14

The Russian Government Megagrant, Creation of molecular, ecological, and industrial microbiology laboratory in the St. Petersburg State Polytechnical University, 05/01/13-12/31/15

Russian Academy of Sciences Presidium Program in Nanotechnology grant, Exploiting lasso-peptides for antibiotic development, 01/01/15-12/31/18

Russian Science Foundation grant, The function and evolution of CRISPR/Cas system, 07/01/14-06/30/17

St. Petersburg State Polytechnical University 5 in 100 strategic development grant, 03/15/14-03/14/15

Skoltech Innovation Program grant, A platform approach to develop new antibiotic leads based on microcins, 03/15/14-03/14/15

US State Department US-Russia Peer-to-Peer Dialogue Program, Cool school lab, 09/30/13-09/29/14

BROAD NEXT10 catalytic steps Award (Feng Zhang, PI, MIT), A search for novel CRISPR effector enzymes for developing transformative technologies, 10/01/2015 - 09/31/2016

Skoltech Innovation Program grant, Development of a personal genetic screening system, 08/15/15-12/31/16

R01 AI117210 (Satish Nair, PI, UIC) Exploring peptide conjugates as Trojan horse systems for drug design and discovery, 02/10/2016-02/09/2021

The Russian Government Megagrant, Creation of molecular, ecological, and industrial microbiology laboratory in the St. Petersburg State Polytechnical University, 01/01/16-12/31/18

Next Generation Program: Skoltech-MIT Joint Projects, Search and Development of New Genome Editing Tools for Biomedicine and Biotechnology (with F. Zhang as Co-PI), 07/01/16-06/31/19

Busch Biomedical Research grant, Harnessing bacterial biodiversity for discovery of novel genome editing tools, 08/01/16-07/31/18

US collaborator on international grants

International Science and Technology Center grant #1176, Use of bacteriophages and lytic phage enzymes as an alternative method of glanders infection treatment with Dr. I. Kalachev, State Research Center of Applied Microbiology, Obolensk, Russia, 05/01/2004-04/30/05

Science and Technology Center of Ukraine grant #3387, Experimental evaluation of efficacy of bacteriophage treatment of bacterial blight in cotton and rice. With Dr. E. Kamilova, Institute of Genetics and Plant Experimental Biology, Academy of Sciences, Republic of Uzbekistan, 02/01/06-01/31/08

Science and Technology Center of Ukraine grant #GE 130, Hyaluronidase Ointment as an Effective Remedy for Treatment of Hypertrophic Scars of Different Origin. With Dr. M. Loladse, Eliava Institute, Tbilisi, Republic of Georgia, 12/01/05-11/30/07

PROFESSIONAL ACTIVITIES

2016	NCI RNA Laboratory site visit team, member
2015	NCI Laboratory of Molecular Biology site visit team, member
2014-present	Director, Skoltech Biotechnology Masters and Ph.D. program
2013	NIH Special Emphasis Panel 05 ZGM1 CBB-0 (MI) (<i>ad hoc</i>)
2013	Russian Academy of Sciences Presidium Molecular and Cellular Biology program expert panel member
2013-present	Member, Editorial board, <i>Journal of Molecular Biology</i>
2012-present	Member, Editorial board, <i>MicrobiologyOpen</i>
2012	NIH Special Emphasis Panel ZRG1 IDM-B, co-chair
2012	Invited speaker, Astana Economic Forum

2012-present	The Bortnik Foundation START program expert panel member
2012	Skolkovo Open University steering board
2012	Rusnanoprize 2012 selection committee
2011-present	The Bortnik Foundation UMNİK program selection committee member
2011-2015	Coordinator, Dmitry Zimin Dynasty Foundation Postdoctoral fellowship in life sciences program
2011	Convener, Fourth RosNanoForum Symposium on Microfluidics and Biological Molecular Machines, Moscow
2010	NIH Biological Chemistry and Macromolecular Biophysics Study Section, review panel member (<i>ad hoc</i>)
2010, 2011	Invited speaker, St. Petersburg Economic Forum
2010	Personal representative of A. A. Fursenko, the Minister of Education and Science of the Russian Federation
2009	Convener, Second RosNanoForum Symposium on Biological Molecular Machines, Moscow
2009	Convener, Phage-Host Interactions Symposium, General ASM Meeting, Philadelphia, PA
2008	Convener, First RosNanoForum Symposium on Biological Molecular Machines, Moscow
2008	NIH Prokaryotic Cell and Molecular Biology Study Section, review panel member (<i>ad hoc</i>)
2008	NIH Pathway to Independence Awards (K99/R00) review panel member (<i>ad hoc</i>)
2008	Russian Academy of Sciences Presidium Molecular and Cellular Biology program expert panel member
2008-2016	Science and Technology Council, Russian State Corporation Rosnano, member
2007	NIH International and Cooperative Projects (ICP1) Study Section, review panel member (<i>ad hoc</i>)
2006	Invited lecturer, Kazakh National Biotechnology Center, Astana, Kazakhstan
2006	NIH Prokaryotic Cell and Molecular Biology Study Section, review panel member (<i>ad hoc</i>)
2004-2006	NIH Drug Discovery and Mechanisms of Antimicrobial Resistance study section, review panel member (<i>ad hoc</i>)
2004	Member, Executive and Governing Council, Northeast Biodefense Center
2004	Co-convener, "Bacterial RNA polymerase structure and function" symposium, IUMS 2005 annual meeting, San Francisco, CA
2003	International Advisory Committee, STCU International Workshop on Biotechnology Commercialization and Security, Tashkent, Uzbekistan

2003-2005	Co-chair, organizing committee of 2005 FASEB Summer Meeting on Prokaryotic Transcription, Saxtons River, VT
2003	NIH MBC-2 study section, review panel member (<i>ad hoc</i>)
2002-2003	Siemens Westinghouse Competition, Biology judging committee member
2002-2007	Review panel member, National Science Foundation, Microbial Genetics, Division of Molecular and Cellular Biosciences
2002-2006	US collaborator on joint projects with former Russian Bioweapons scientists, Cooperative Threat Reduction program, Defense Threat Reduction Agency, DOD
2001-2003	Chair, organizing committee of 2003 FASEB Summer Meeting on Prokaryotic Transcription, Saxtons River, VT
2001-2005	Instructor, Cold Spring Harbor Laboratory Protein Purification and Characterization practical course
2001-2015	Member, Editorial board, <i>Protein Expression and Purification</i>
2000	Divisional Group IV Lecturer and organizer of symposium on RNA polymerase for ASM General Meeting, Los Angeles, CA
1999-2004	Associate editor, <i>Genes to Cells</i>
1998	Session Chair, “RNA Polymerase structure and function”, Post-initiation activities of RNA Polymerase, Mountain Lake, VA

Grant reviewing

Austrian Science Fund (FWF), BBSRC; Busch Biomedical Grants; Croatian Science Foundation, Czech Science Foundation; European Research Council, Foundation for Polish Science; Israel Science Foundation; NSERC-CRSNG (Canada); Pennsylvania Department of Health; Programme de Recherche Fondamentale en Microbiologie et Maladies Infectieuses et Parasitaires, French Ministry of Culture; Fulbright-Russia program; Moscow State University young scientists competition; Potanin Foundation; Research Corporation; Skolkovo Foundation; US Air Force Office of Scientific Research, US Department of Energy Biosciences Program; US Department of Veterans Affairs; USA-Israel Binational Foundation; Wellcome Trust, UK

Journal reviewing

ACS Med. Chem. Letts., *Appl. Biochem. Biotech.*, *Appl. Env. Microbiol.*, *Arch. Microbiol.*, *Biochemistry*, *Biochimie*, *Bioinformatics*, *Biol. Chem.*, *Biotechnol. Bioengineer.*, *BMC Bioinformatics*, *BMC Microbiol.*, *BMC Mol. Biol.*, *BMC Res. Notes*, *Cell*, *Chemical Reviews*, *EMBO J.*, *EMBO Reports*, *Eur. J. Biochem.*, *Exp. Opin. Therap. Patents.*, *FEBS Letts.*, *FEMS Immunol. Med. Microbiol.*, *FEMS Microbiol. Letts.*, *Future Microbiol.*, *Gene*, *Genes to Cells*, *J. Am. Chem. Soc.*, *J. Antimicrob. Chemother.*, *J. Bacteriol.*, *J. Basic Microbiol.*, *J. Bioinform. Comp. Biol.*, *J. Biol. Chem.*, *J. Immun. Methods*, *J. Microbiol.*, *J. Mol. Biol.*, *J. Mol. Microbiol. Biotechnol.*, *Journal of Nucl. Acids*, *J. Virol.*, *Mbio*, *Microbiology*, *Mol. Biol. (Russ.)*, *Mol. Cell*, *Mol. Microbiol.*, *Microbiol. Mol. Biol. Rev.*, *Nature*, *Nature Commun.*, *Nature Chem. Biol.*, *Nature Struct. Mol. Biol.*, *Nucleic Acids Res.*, *Nucleos. Nucleotid. Nucl. Acids*, *Phyl. Trans.*, *PLOS Genetics*, *PLOS One*, *Proc. Natl. Acad. Sci. USA*, *Proc. Russian Acad. Sci.*, *Prot. Expr. Purif.*, *RNA Biol.*, *Scientific Reports*, *Transcription*, *Trends Microbiol.*, *Virology*, *Virus Research*

Consulting

2004 - 2005	Northrop Grumman
2009	Sequenom
2010	McKinsey & Co.
2011-2013	Skolkovo Foundation (advisor to Vice President)
2011	Russian Venture Company
2011	BiOptix (Board of directors 2011-2013)
2011-2014	Petrovaks (Scientific advisor to the board of directors)

TEACHING (at Rutgers unless otherwise stated)

2014 – present

Skolkovo Institute of Science and Technology, Molecular Biology Methods lab and seminar
4 8-week sections 3 credits each

8-12 graduate or master students per section

S/F-2011 – S/F-2013

Moscow Institute of Physics and Technology, Yandex School of Data Analysis, Introduction to Molecular Biology and Biochemistry lecture course.

~20 math undergraduate and graduate students

F-2010

Molecular Virology lecture course at the Pushchino State University, Russia (supported by a Fulbright scholarship) 20 master students.

S-2009

Molecular Biology and Biochemistry 115:407:511 3-credit lecture course.

~250 undergraduates and graduates. 5 lectures on bacterial genetics.

F-2006 – F-2008

Molecular biology seminar at the Moscow State University Molecular Biology Department
15 undergraduates.

F-2004 - present

Molecular Biology and Biochemistry 115:407:511 3-credit lecture course.

~250 undergraduates and graduates. 6 lectures on proteins and nucleic acids structure.

S-2003 – S-2005

Genetics 16:115:502 3-credit lecture course.

50 graduate students. 4 lectures on bacterial genetics.

F-2000 – F-2002

Topics in molecular genetics 01:447:480 3-credit lecture course.

20 undergraduate students (majors). Served as a course director, designed the course and selected textbook used. 20 lectures.

S/F-2000 S/F-2003

Core Curriculum 1-credit molecular biology seminar course.

12 graduate students.

S-2000 – S-2002

Genetics 01:447:380 4-credit lecture course.

150 undergraduate students. 6 lectures on basic molecular biology.

F-1998 – F-2003

Biochemistry 16:115:502 3-credit lecture course.

50 graduate students. 3 lectures on the nucleic acids structure.

Ph. D. DISSERTATIONS SUPERVISED (Russian Academy of Sciences unless indicated otherwise)

Savva Zorov (2006), Teimoor Kazakov (2008), Dhruti Savalia (2008, Rutgers University), Ekaterina Bogdanova (2009), Olga Pavlova (2009), Alexej Protsenko (2009), Maria Novikova (2009), Ekaterina Stepanova (2009), Maxim Nagornykh (2010), Andrey Shadrin (2010), Mark Chlenov (2010), Olga Khasanova (2010), Ksenia Pougach (2011), Dmitry Giljarov (2011), Gaston VondenHoff (2012, Catholic University of Leuven), Anton

Tikhonov (2012), Evgeny Klimuk (2013), Darja Lavysh (2013), Mikhail Metelev (2013), Inna Zukher (2015), Olga Bantysh (2015)

D. Sc. DISSERTATIONS SUPERVISED

Fuat Khasanov (2011)

PEER REVIEWED PUBLICATIONS

1. **Severinov, K.**, Melnikova, E., and Ryazanov, A. (1990) Down-regulation of the translation elongation factor 2 kinase in *Xenopus laevis* oocytes at the final stages of oogenesis. *New Biol.*, **2**, 887-893
2. Price, N., Redpath, N., **Severinov, K.**, Campbell, D., Russel, R., and Proud, C. (1991) Identification of the phosphorylation sites in elongation factor 2 from rabbit reticulocytes. *FEBS Lets.*, **282**, 253-258
3. Borukhov, S., **Severinov, K.**, Kashlev, M., Lebedev, A., Bass, I., Rowland, G. C., Lim, P-P., Glass, R. E., Nikiforov, V., and Goldfarb, A. (1991) Mapping of trypsin cleavage and antibody binding sites and delineation of a dispensable region in the β subunit of *Escherichia coli* RNA polymerase. *J. Biol. Chem.*, **266**, 23921-23926
4. **Severinov, K.**, Mustaev, A., Kashlev, M., Borukhov, S., Nikiforov, V., and Goldfarb, A. (1992) Dissection of the β subunit in the *E. coli* RNA polymerase into domains by proteolytic cleavage. *J. Biol. Chem.*, **267**, 12813-12819
5. Redpath, N., Price, N., **Severinov, K.**, and Proud, C. (1993) Regulation of elongation factor 2 by multisite phosphorylation. *Eur. J. Biochem.*, **213**, 689-699
6. **Severinov, K.**, Soushko, M., Goldfarb, A., and Nikiforov, V. (1993) Rifampicin region revisited: New Rifampicin-resistant and Streptolydigin-resistant mutants in the β subunit of *Escherichia coli* RNA polymerase. *J. Biol. Chem.*, **268**, 14280-14825
7. Kashlev, M., Martin, E., Polyakov, A., **Severinov, K.**, Nikiforov, V., and Goldfarb, A. (1993) Histidine-tagged RNA polymerase: Dissection of the transcription cycle using immobilized enzyme. *Gene*, **130**, 9-14
8. Ross, W., Gosink, K. K., Salomon, J., Igarashi, K., Zou, K., Ishihama, A., **Severinov, K.**, and Gourse, R. L. (1993) A third recognition element in prokaryotic promoters: Site-specific DNA binding by the α subunit of RNA polymerase. *Science*, **262**, 1407-1413
9. **Severinov, K.**, Kashlev, M., Severinova, E., Bass, I., McWilliams, K., Kutter, E., Nikiforov, V., Snyder, L., and Goldfarb, A. (1994) A non-essential domain of *E. coli* RNA polymerase required for the action of the termination factor Alc. *J. Biol. Chem.*, **269**, 14254-14259
10. **Severinov, K.**, Soushko, M., Goldfarb, A., and Nikiforov, V. (1994) Rif^R mutations in the beginning of *Escherichia coli* *rpoB* gene. *Mol. Gen. Genet.*, **244**, 120-126
11. **Severinov, K.**, Fenyö, D., Severinova, E., Mustaev, A., Chait, B. T., Goldfarb, A., and Darst, S. A. (1994) The σ -subunit conserved region 3 is part of the "5'-face" of the active center of *Escherichia coli* RNA polymerase. *J. Biol. Chem.*, **269**, 20826-20828
12. Mustaev, A., Zaychikov, E., **Severinov, K.**, Kashlev, M., Polyakov, A., Nikiforov, V., and Goldfarb, A. (1994) Topology of RNA polymerase active center probed by chimerical rifampicin-nucleotide compounds. *Proc. Natl. Acad. Sci. USA*, **91**, 12036-12040
13. **Severinov, K.** and Goldfarb, A. (1994) Topology of the product binding site in RNA polymerase revealed by transcript slippage at the phage λ P_L promoter. *J. Biol. Chem.*, **269**, 31701-31705
14. Tang, H., **Severinov, K.**, Goldfarb, A., Fenyö, D., Chait, B. T., and Ebright, R. (1994) Identification of a transcription activation target on RNA polymerase: Mutants of RNA

polymerase alpha subunit specifically defective in transcription activation at class I CAP-dependent promoters. *Genes & Devl.*, **8**, 3058-3067

15. **Severinov, K.**, Mustaev, A., Severinova, E., Bass, I., Kashlev, M., Landick, R., Nikiforov, V., Goldfarb, A., and Darst, S. A. (1995) Assembly of functional *Escherichia coli* RNA polymerase using β subunit fragments. *Proc. Natl. Acad. Sci. USA*, **92**, 4591-4595
16. Tang, H., **Severinov, K.**, Goldfarb, A., and Ebright, R. (1995) Rapid RNA polymerase genetics: One-day, no-column preparation of reconstituted recombinant *Escherichia coli* RNA polymerase. *Proc. Natl. Acad. Sci. USA*, **92**, 4902-4906
17. Tinker, R. L., Sanders, G. M., **Severinov, K.**, Kassavetis, G. A., and Geiduschek, E. P. (1995) The COOH-terminal domain of the RNA polymerase α subunit in transcriptional enhancement and deactivation at the bacteriophage T4 late promoter. *J. Biol. Chem.*, **270**, 15899-15907
18. **Severinov, K.**, Markov, D., Nikiforov, V., Severinova, E., Landick, R., Darst, S. A., and Goldfarb, A. (1995) Streptolydigin-resistant mutants in an evolutionary conserved region of the β' subunit of *Escherichia coli* RNA polymerase. *J. Biol. Chem.*, **270**, 23926-23929
19. **Severinov, K.**, Mustaev, A., Severinova, E., Kozlov, M., Darst, S. A., and Goldfarb, A. (1995) The β subunit Rif-cluster I is only angstroms away from the active center of *Escherichia coli* RNA polymerase. *J. Biol. Chem.*, **270**, 29428-29432
20. Liu, K., Zhang, K., **Severinov, K.**, Das, A., and Hanna, M. (1996) Modulation of pausing, termination and antitermination in *E. coli* by elongation factor NusA: Role of RNA polymerase alpha subunit. *EMBO J.*, **15**, 150-161
21. Heyduk, T., Heyduk, E., **Severinov, K.**, Tang, H., and Ebright, R. H. (1996) Rapid epitope mapping by hydroxyl-radical protein footprinting: determinants of RNA polymerase alpha subunit for interaction with beta, beta' and sigma subunits. *Proc. Natl. Acad. Sci. USA*, **93**, 10162-10166
22. **Severinov, K.**, Mustaev, A., Kukarin, A., Muzzin, O., Bass, A., Darst, S. A., and Goldfarb, A. (1996) Structural modules of the largest subunits of RNA polymerase: Introducing archaeobacterial and chloroplast split sites in the β and β' subunits of *Escherichia coli* RNA polymerase. *J. Biol. Chem.*, **271**, 27969-27974
23. Severinova, E., **Severinov, K.**, Fenyő, D., Chait, B. T., Brody, E. T., and Darst, S. A. (1996) Domain organization of the σ^{70} subunit of *Escherichia coli* RNA polymerase. *J. Mol. Biol.*, **263**, 637-647
24. Wang, Y., **Severinov, K.**, Loizos, N., Fenyő, D., Heyduk, E., Heyduk, T., Chait, B. T., and Darst, S. A. (1997) Determinants for *Escherichia coli* RNA polymerase assembly within the β subunit. *J. Mol. Biol.*, **270**, 648-662
25. Wang, D., **Severinov, K.**, and Landick, R. (1997) Preferential interaction of the his pause RNA hairpin with RNA polymerase beta subunit residues 904-950 correlates with strong transcriptional pausing. *Proc. Natl. Acad. Sci. USA*, **94**, 8433-8438
26. **Severinov, K.**, Mooney, R., Darst, S. A., and Landick, R. (1997) Tethering of the largest subunits of *E. coli* RNA polymerase. *J. Biol. Chem.*, **272**, 24137-24140
27. **Severinov, K.** and Darst, S. A. (1997) A mutant RNA polymerase that forms unusual promoter complexes. *Proc. Natl. Acad. Sci. USA*, **94**, 13481-13486
28. Severinova, E., **Severinov, K.**, and Darst, S. A. (1998) Inhibition of *Escherichia coli* RNA polymerase by T4 AsiA. *J. Mol. Biol.*, **279**, 9-18
29. Muzzin, O., Campbell, E. A., Xia, L., Severinova, E., Darst, S. A., and **Severinov, K.** (1998) Disruption of *Escherichia coli* HepA, an RNA polymerase associated protein, causes UV sensitivity. *J. Biol. Chem.*, **273**, 15157-15182

30. Severinov, K. and Muir, T. (1998) Expressed protein ligation: A novel method to study protein-protein interactions in transcription. *J. Biol. Chem.*, **273**, 16205-16209
31. Zakharova, N., Hoffman, P. S., Berg, D. E., and Severinov, K. (1998) The largest subunits of RNA polymerase from gastric helicobacters are tethered. *J. Biol. Chem.*, **273**, 19371-19374
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