Valentin V. Rybenkov, Ph.D.

Associate Professor
Department of Chemistry and Biochemistry
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Education:
1989: M.S., Physics, mathematics, Moscow Institute of Physics and Technology, Russia
1992: Ph.D., Biophysics, Moscow Institute of Physics and Technology, Russia
1993-2000: Postdoc, Biochemistry and Molecular biology, University of California, Berkeley

Academic Appointments:
1989-1992: Graduate Student (advisor Alexander V. Vologodskii, Ph.D.), Moscow Institute of Physics and Technology
1992-1993: Junior Research Scientist (laboratory of Maxim D. Frank-Kamenetskii, Ph.D.), Institute of Molecular Genetics, Russia
1993-1997: Postdoctoral Fellow (laboratory of Nicholas R. Cozzarelli, Ph.D.), University of California, Berkeley
1997-2000: Assistant Specialist (laboratory of Nicholas R. Cozzarelli, Ph.D.), University of California, Berkeley
2000-2007: Assistant Professor, University of Oklahoma
2007-present: Associate Professor, University of Oklahoma

Honors and Awards:
1982: First place in the All-Russia Olympics in Physics among students
1989: Graduated with Honor from Moscow Institute of Physics and Technology
2000: Research Innovation Award, Research Corporation
2001: Junior Faculty Award, University of Oklahoma

Other Professional Experiences and Memberships:
1994: Fellow in Member's Lab; Program of Mathematics and Molecular Biology
2011: Research Editor for Frontiers in Antimicrobials, Resistance and Chemotherapy
2011: Editor for PLoS One
2012: Member, Epigenetics and RNA-mediated Regulation Panel, National Science

Research Support:
Current:

Past:

- 2011-2015: NSF, "Mechanism of condensins and cohesins", Role: PI Rybenkov (PI)

- 2011-2014: NIH R21, "Structural chromosome maintenance in Pseudomonas aeruginosa", Role: PI
- 2011-2014: NIH R21, "Reconstitution of two-membrane transporters into high density lipoprotein particles", Role: Co-Investigator
- 2009-2012: NIH R21, "Nanomanipulation analysis of lipoplex assembly Rybenkov", Role: PI
- 2008-2011: Oklahoma Center for the Advancement of Science and Technology, "DNA reshaping by condensins", Role: PI

Selected Publications:

1. Rybenkov, V.V. and Vologodskii, A.V., "DNA effective diameter." Molekulyar. Biologiya, 26, 1433-1439, 1992; PMID: 1491684.
2. Rybenkov, V.V., Cozzarelli, N.R. and Vologodskii, A.V., "The probability of DNA knotting and the effective diameter of the DNA double helix." Proc. Natl. Acad. Sci. USA, 90, 5307-5311, 1993. PMCID: PMC46705.
3. Rybenkov, V.V., Vologodskii, A.V. and Cozzarelli, N.R., "The effect of ionic conditions on conformations of supercoiled DNA. I Sedimentation analysis." J. Mol. Biol., 267, 299-311, 1997. PMID: 9096227.
4. Rybenkov, V.V., Vologodskii, A.V. and Cozzarelli, N.R., "The effect of ionic conditions on conformations of supercoiled DNA. II Catenation equilibrium." J. Mol. Biol., 267, 312-323, 1997; PMID: 9096228.
5. Rybenkov, V.V., Vologodskii, A.V. and Cozzarelli, N.R., "The effect of ionic conditions on DNA helical repeat, effective diameter, and free energy of supercoiling" Nucl. Acids Res., 25, 1412-1418, 1997; PMCID: PMC146597.
6. Rybenkov, V.V., Ullsperger, C. U., Vologodskii, A.V. and Cozzarelli, N.R., "Simplification of DNA topology below equilibrium values by type II topoisomerases." Science, 277, 690-693, 1997; PMID: 9235892.
7. Alexandrov, A.I., Cozzarelli N.R., Holmes, V.F., Khodursky, A.B., Peter, B.J., Postow, L., Rybenkov, V.V. and Vologodskii, A.V. "Mechanisms of separation of the complementary strands of DNA during replication." in "Structural Biology and Functional Genomics", NATO Science Series 3 (High technology), E. Morton Bradbury and Sandor Pongor (eds), Kluwer Academic Publishers, Dordrecht, Boston, London, 1999, pp. 217-235; PMID: 10710719.
8. Kimura, K., Rybenkov, V.V., Crisona, N., Hirano, T. and Cozzarelli, N.R. "13S condensin actively reconfigures DNA by introducing global positive writhe: implications for chromosome condensation" Cell, 98 (2), 239-248, 1999; PMID: 10428035.
9. Vologodskii, A.V., Zhang, W., Rybenkov, V.V., Podtelezhnikov, A.A., Subramanian, D., Griffith, J.D., Cozzarelli, N.R. "Mechanism of topology simplification by type II DNA topoisomerases", Proc. Natl. Acad. Sci., (2001) 98(6), 3045-3049. PMCID: PMC30604.
10. Dekker, N.H., Rybenkov, V.V., Duguet, M., Cozzarelli, N.R., Bensimon, D. "The Mechanism of Type IA Topoisomerases"Proc. Natl. Acad. Sci. USA, (2002) 99(19):12126-31. PMCID: PMC129409 Comment in Proc. Natl. Acad. Sci. USA, 99(19):11998-12000, 2002.
11. Petrushenko, Z.M., Lai, C., Rai, R., Rybenkov, V.V. "DNA reshaping by MukB: right-handed knotting, left-handed supercoiling" J. Biol. Chem., (2006) 281(8):4606-15. PMCID: PMC1633270.
12. Wang, Q., Mordukhova, E.A., Edwards A.L., Rybenkov, V.V. "Chromosome condensation in the absence of the non-SMC subunits of MukBEF." J. Bacteriol. (2006) 188(12):4431-41. PMCID: PMC1482961.
13. Petrushenko, Z.M., Lai, C., Rybenkov, V.V. "Antagonistic interactions of kleisins and DNA with bacterial condensin MukB." J. Biol. Chem., (2006) 281(45): 34208-17. PMCID: PMC1634889.
14. Rybenkov, V. V. (2006). DNA unlinking in bacteria, In KITP Program: New Physical Approaches to Molecular and Cellular Machines (Santa Barbara, CA) http://online.itp.ucsb.edu/online/biomachine06/rybenkov/.
15. She, W., Wang, Q., Mordukhova, E.A., Rybenkov, V.V. "MukEF is required for stable association of MukB with the chromosome" J.Bacteriol., (2007) 189(19):7062-8 PMCID: PMC2045213.
16. Cui, Y, Petrushenko, Z.M., Rybenkov, V.V. "MukB acts as a macromolecular clamp in DNA condensation" Nat. Struct. Mol. Biol., (2008) 15(4): 411-8. PMID: 18376412. Comment in JCB, 181:177, 2008.
17. Rybenkov, V.V. "Towards the architecture of the chromosomal architects" Nat. Struct. Mol. Biol., (2009) 16(2): 104-5. PMID: 19190662.
18. Tikhonova EB, Dastidar V, Rybenkov VV, Zgurskaya HI. "Kinetic control of TolC recruitment by multidrug efflux complexes." Proc Natl Acad Sci U S A.; 106(38):16416-21; PMCID: PMC2752513.
19. Vologodskii AV and Rybenkov VV "Simulation of DNA catenanes." Phys. Chem. Chem. Phys., 2009, 11: 10543-10552 PMCID: PMC2845312.
20. Petrushenko, Z.M., Cui, Y., She, W. and Rybenkov, V.V. "Mechanics of DNA bridging by bacterial condensin MukB in vitro and in singulo" EMBO J., 2010, 29(6): 1126-35; PMCID: PMC2845270.
21. Petrushenko, Z.M., She, W. and Rybenkov, V.V. "A new family of bacterial condensins" Mol Microbiol., 2011, 81: 881-896, PMID: 21752107. Comment in Mol. Microbiol., 81(4):855- 859, 2011.

22. Sun, Z., Tikhonova, E.B., Zgurskaya, H.I. and Rybenkov, V.V. "Parallel Lipoplex Folding Pathways Revealed Usin Magnetic Tweezers" Biomacromolecules, 2012, 13(10):3395-400; PMID: 22988939.
23. She, W., E. Mordukhova, H. Zhao, Z.M. Petrushenko, and V.V. Rybenkov, Mutational analysis of MukE reveals its role in focal subcellular localization of MukBEF. Mol Microbiol, 2013. 87(3): p. 539-52. PMID:23171168.