Vsevolod Jurievich MAKEEV

CURRICULUM VITAE

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Degrees: Mr.Sci: January 1990 in Physics (Moscow State University)
Dynamics of excitations in quasi-one-dimensional chains.
(Supervisor Dr. Poponin, V.P.)

PhD (Cand. Sci.): March 1996 in Biophysics (Moscow State University)
Analysis of periodical patterns in sequences of different types of
collagen. Development of the method of matrix Fourier transform (Advisor Esipova, N.G.)

Dr.Sci (IV degree) : January 2010 in Physics and Mathematics (Moscow State University)
Theoretical analysis of sequences of regulatory regions in genomes.

Positions held:

2010 - Vavilov Institute of General Genetics, Russian Academy of Sciences

Head of Division of Computational and System Biology

2001-2010 - Federal State Unitary Enterprise, Research Institute of Genetics and Selection of Industrial Microorganisms, GosNIIGenetika,

Head of the Laboratory of Bioinformatics

1993-2001 - Engelhardt Institute of Molecular Biology, Russian Academy of Sciences.

Junior Fellow Researcher,
Fellow Researcher

1990-1993 - Lebedev Physical Institute, Russian Academy of Sceinces.

Research Assistant

Visiting positions: LaBRI, Bordeaux, France, August – November 2011, Invited CNRS high-level scientist

Scientific interests:

Computational biology, bioinformatics, statistics, probability theory,
genomics, development, transcription, genetic networks.

Selected Publications (the complete list of about 40 publications is attached as a separate document):

1: Kulakovskiy IV, Boeva VA, Favorov AV, Makeev VJ. Deep and wide digging for binding motifs in ChIP-Seq data. Bioinformatics. 2010 Oct 15;26(20):2622-3. Epub 2010 Aug 24.
2: Kulakovskiy IV, Favorov AV, Makeev VJ. Motif discovery and motif finding from genome-mapped DNase footprint data. Bioinformatics. 2009 Jul 15. [Epub ahead of print] PubMed PMID: 19605419.
3: Boeva V, Clement J, Regnier M, Roytberg MA, Makeev VJ. Exact p-value calculation for heterotypic clusters of regulatory motifs and its application in computational annotation of cis-regulatory modules. Algorithms Mol Biol. 2007 Oct 10;2:13. PubMed PMID: 17927813; PubMed Central PMCID: PMC2174486.
4: Favorov AV, Gelfand MS, Gerasimova AV, Ravcheev DA, Mironov AA, Makeev VJ. (2005) A Gibbs sampler for identification of symmetrically structured, spaced DNA motifs with improved estimation of the signal length. Bioinformatics. May 15;21(10):2240-5.
5: Lifanov, A.P, Makeev, V.Ju, Nazina, A., Papatsenko, D.A (2003) Homotypic regulatory clusters in Drosophila. Genome Research, vol 13(4), pp. 579-88.

Teaching activities:
Supervision of PhD dissertations.

1. FRANK, Gleb K. Periodic properties of genomic nucleotide sequences.
Defended: Moscow Institute of Physics and Technology, June 24, 1997.

2. KOTELNIKOVA, Ekaterina, A. Evolution of nucleotide sequences of DNA sites of transcription regulator binding in bacteria.
Defended: Moscow State University, July 23, 2005

3. FAVOROV, Alexander, V. Discovery of DNA sites for specific binding of protein transcription regulators using Markov Chain Monte-Carlo methods.
Defended: Moscow Institute of Physics and Technology, November 17, 2005.

4. BOEVA, Valentina, A. Identification and analysis of tandem repeats and similar structured signals in DNA sequences.
Defended: Institute of Theoretic and Experimental Biophysics, Russian Academy of Sciences, Puschino, Moscow Region, January 24, 2007.

5. RAKHMANOV, Sergei, V. Statistical potentials for protein atom hydration.
Defended: State Research Center of Genetics and Selection of Industrial Microorganisms, December 16, 2008

6. MEDVEDEVA, Yulia, A. Bioinformatics studies of functional properties of CpG islands participating in transcription regulation in intragenic and intergenic region of human genome.
Defended: State Research Center of Genetics and Selection of Industrial Microorganisms, December 7, 2010

7. BELOSTOTSKIY, Alexander A. Analysis of chromatin structure and transcription regulation molecular complexes and identification of functional genome elements by methods of systems biology.
Defended: State Research Center of Genetics and Selection of Industrial Microorganisms, March 13, 2012

Additional activities:

Journal of Biomolecular Structure and Dynamics, the Editor.

1999. II congress of Russian Biophysicists. Member of the organization committee.
2003. Moscow Conference on Computational Molecular Biology (MCCMB'03). Chair of the local organization committee.
2005. Moscow Conference on Computational Molecular Biology (MCCMB'05). Co-Chair of the organization committee.
2007. 3rd Moscow Conference on Computational Molecular Biology (MCCMB'07). Co-Chair of the organization committee.
2009. 4rd Moscow Conference on Computational Molecular Biology (MCCMB'09). Co-Chair of the organization committee.

Reviewer: Nucleic Acid Research, Bioinformatics, BMC Genomics, BMC Bioinformatics, PLOS Biology, PLOS Genetics, FEMS Microbiology, J. of Biology, Molecular Systems Biology, J. of Bioinformatics and Computational Biology, J. of Theoretical Biology, Pattern Recognition Letters, Gene, Biology Direct, Computers in Biology and Medicine.

Biotekhnologiya (russ), Biofizika (russ), Molekulyanaja Biologiya (russ)

Grant reviewer:
INTAS, ERA-NET, FP6, ANR

Grant awards: Russian fund of basic research, Fogarty foundation, INTAS, INRIA

Languages:
Russian (native), English (fluent), German (reading), French (reading)

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THE COMPLETE LIST OF SCIENTIFIC PUBLICATIONS:

1. Permina EA, Medvedeva YA, Baeck PM, Hegde SR, Mande SC, Makeev VJ. Identification of self-consistent modulons from bacterial microarray expression data with the help of structured regulon gene sets. J Biomol Struct Dyn. 2012 Jul 18. [Epub ahead of print] PubMed PMID: 22803819.
2. Nikulova AA, Favorov AV, Sutormin RA, Makeev VJ, Mironov AA. CORECLUST: identification of the conserved CRM grammar together with prediction of gene regulation. Nucleic Acids Res. 2012 Mar 15.
3. Hara Y, Kadotani N, Izui H, Katashkina JI, Kuvaeva TM, Andreeva IG, Golubeva LI, Malko DB, Makeev VJ, Mashko SV, Kozlov YI. The complete genome sequence of Pantoea ananatis AJ13355, an organism with great biotechnological potential. Appl. Microbiol Biotechnol. 2012 Jan;93(1):331-41.
4. Hedge Sh, Klimova EIu, Mande Sh, Medvedeva IuA, Makeev VIu, Permina EA. [Using the operonic gene pairs for establishing the treshold for correlation coefficient of differently expressed genes]. Biofizika. 2011 Nov-Dec;56(6):1062-4. R
5. Kulakovskiy IV, Belostotsky AA, Kasianov AS, Esipova NG, Medvedeva YA, Eliseeva IA, Makeev VJ. A Deeper Look Into Transcription Regulatory Code By Preferred Pair Distance Templates For Transcription Factor Binding Sites. Bioinformatics. 2011, 27:2621-2624.
6. Logacheva MD, Kasianov AS, Vinogradov DV, Samigullin TH, Gelfand MS, Makeev VJ, Penin AA. De novo sequencing and characterization of floral transcriptome in two species of buckwheat (Fagopyrum). BMC Genomics. 2011 Jan 13;12(1):30.
7. Kulakovskiy IV, Boeva VA, Favorov AV, Makeev VJ. Deep and wide digging for binding motifs in ChIP-Seq data. Bioinformatics. 2010 Oct 15;26(20):2622-3.
8. Medvedeva YA, Fridman MV, Oparina NJ, Malko DB, Ermakova EO, Kulakovskiy IV, Heinzel A, Makeev VJ. Intergenic, gene terminal, and intragenic CpG islands in the human genome. BMC Genomics. 2010 Jan 19;11:48.
9. Kulakovskiy IV, Favorov AV, Makeev VJ. Motif discovery and motif finding from genome-mapped DNase footprint data. Bioinformatics. 2009 Sep 15;25(18):2318-25.
10. Kulakovskiĭ IV, Makeev VIu. [Integration of data obtained by different experimental methods to determine the motifs in DNA sequences recognized by transcription-regulating factors]. Biofizika. 2009 Nov-Dec;54(6):965-74. (the paper in Russian)
11. Polishchuk MS, Heinzel A, Favorov AV, Makeev IuV. [A comparative analysis of the binding sites of proteins regulating the transcription in the early development of Drosophila melanogaster, determined by the ChIP-chip method and the theoretically predicted clusters of the binding sites of these proteins]. Biofizika. 2008 Sep-Oct;53(5):754-7. (the paper in Russian).
12. Bogush VG, Sokolova OS, Davydova LI, Klinov DV, Sidoruk KV, Esipova NG, Neretina TV, Orchanskyi IA, Makeev VY, Tumanyan VG, Shaitan KV, Debabov VG, Kirpichnikov MP. A novel model system for design of biomaterials based on recombinant analogs of spider silk proteins. J Neuroimmune Pharmacol. 2009 Mar;4(1):17-27.
13. Lifanov AP, Vlasov PK, Makeev VIu, Esipova NG. [Nucleosomal repeat and the location of exons and introns in genes of collagens types I and VII]. Biofizika. 2008 May-Jun;53(3):524-8. Russian.
14. Rakhmanov SV, Makeev VIu. [Application of noninteracting probes in the protein structure space for the construction of statistical potentials for atom-atom interactions]. Biofizika. 2008 May-Jun;53(3):389-96. Russian.

15. Britanova LV, Makeev VJ, Kuprash DV. In vitro selection of optimal RelB/p52 DNA-binding motifs. Biochem Biophys Res Commun. 2008 Jan 18;365(3):583-8.
16. Boeva V, Clement J, Regnier M, Roytberg MA, Makeev VJ. Exact p-value calculation for heterotypic clusters of regulatory motifs and its application in computational annotation of cis-regulatory modules. Algorithms Mol Biol. 2007 Oct 10;2:13.
17. Enikeeva FN, Kotelnikova EA, Gelfand MS, Makeev VJ. A model of evolution with constant selective pressure for regulatory DNA sites. BMC Evol Biol. 2007 Jul27;7:125.
18. Rakhmanov SV, Makeev VJ. Atomic hydration potentials using a Monte Carlo Reference State (MCRS) for protein solvation modeling. BMC Struct Biol. 2007 Mar 30;7:19.
19. Boeva VA, Fridman MV, Makeev VIu. [Relationship between micro- and minisatellites in the human genome]. Biofizika. 2006 Jul-Aug;51(4):650-5. (Rus)
20. Stavrovskaia ED, Makeev VIu, Mironov AA. [ClusterTree-RS: the binary tree algorithm for identification of co-regulated genes by clustering regulatory signals]. Mol Biol (Mosk). 2006 May-Jun;40(3):524-32. Russian.
21. Malko DB, Makeev VJ, Mironov AA, Gelfand MS. Evolution of exon-intron structure and alternative splicing in fruit flies and malarial mosquito genomes. Genome Res. 2006 Apr;16(4):505-9. Epub 2006.
22. Boeva V, Regnier M, Papatsenko D, Makeev V. Short fuzzy tandem repeats in genomic sequences, identification, and possible role in regulation of gene expression. Bioinformatics. 2006 Mar 15;22(6):676-84.
23. Favorov AV, Gelfand MS, Gerasimova AV, Ravcheev DA, Mironov AA, Makeev VJ. A Gibbs sampler for identification of symmetrically structured, spaced DNA motifs with improved estimation of the signal length. Bioinformatics. 2005 May 15;21(10):2240-5..
24. Kotelnikova EA, Makeev VJ, Gelfand MS. Evolution of transcription factor DNA binding sites. Gene. 2005 Mar 14;347(2):255-63.
25. Tompa M, Li N, Bailey TL, Church GM, De Moor B, Eskin E, Favorov AV, Frith MC, Fu Y, Kent WJ, Makeev VJ, Mironov AA, Noble WS, Pavesi G, Pesole G, Regnier M, Simonis N, Sinha S, Thijs G, van Helden J, Vandenbogaert M, Weng Z, Workman C, Ye C, Zhu Z. Assessing computational tools for the discovery of transcription factor binding sites. Nat Biotechnol. 2005,(1):137-44.
26. Ragulina LE, Makeev VIu, Esipova NG, Tumanian VG, Vlasov PK, Bogush VG, Dababov VG. [An analysis of the secondary structure of spider spidroins I and II belonging to different species]. Biofizika. 2004 Nov-Dec;49(6):1147-9. Russian.
27. Ragulina LE, Makeev VIu, Esipova NG, Tumanian VG, Nikitin AM, Bogush VG, Dababov VG. [A study of periodicity in the primary structure of spidroin 1 and spidroin 2 from spiders belonging to various species]. Biofizika. 2004 Nov-Dec;49(6):1053-60. Russian
28. Kattenhorn LM, Mills R, Wagner M, Lomsadze A, Makeev V, Borodovsky M, Ploegh HL, Kessler BM. Identification of proteins associated with murine cytomegalovirus virions. J Virol. 2004 Oct;78(20):11187-97.
29. Makeev VJ, Lifanov AP, Nazina AG, Papatsenko DA. Distance preferences in the arrangement of binding motifs and hierarchical levels in organization of transcription regulatory information. Nucleic Acids Res. 2003 Oct 15;31(20):6016-26.
30. Kalinina OV, Makeev VJ, Sutormin RA, Gelfand MS, Rakhmaninova AB. The channel in transporters is formed by residues that are rare in transmembrane helices. In Silico Biol. 2003;3(1-2):197-204.

31. Vandenbogaert M, Makeev V. Analysis of bacterial RM-systems through genome-scale analysis and related taxonomy issues. In Silico Biol. 2003;3(1-2):127-43. Epub 2003.
32. Lifanov AP, Makeev VJ, Nazina AG, Papatsenko DA. Homotypic regulatory clusters in Drosophila. Genome Res. 2003 Apr;13(4):579-88.
33. Kravatskaia GI, Frank GK, Makeev VIu, Esipova NG. [Similarities in periodical structures in the position of nucleotides in regions of initiation of replication of bacterial genomes]. Biofizika. 2002 Jul-Aug;47(4):595-9. Russian.
34. Papatsenko DA, Makeev VJ, Lifanov AP, Regnier M, Nazina AG, Desplan C.Extraction of functional binding sites from unique regulatory regions: the Drosophila early developmental enhancers. Genome Res. 2002 Mar;12(3):470-81.
35. Ramensky VE, Makeev VJ, Roytberg MA, Tumanyan VG. Segmentation of long genomic sequences into domains with homogeneous composition with BASIO software. Bioinformatics. 2001 Nov;17(11):1065-6.
36. Ramensky VE, Makeev VJu, Roytberg MA, Tumanyan VG. DNA segmentation through the Bayesian approach. J Comput Biol. 2000 Feb-Apr;7(1-2):215-31.
37. Esipova NG, Kutuzova GI, Makeev VIu, Frank GK, Balandina AV, Kamashev DE, Karpov VL. [Analysis of peculiarities in nucleotides disposition in the origin of chromosome replication-oriC from Escherichia coli]. Biofizika. 2000 May-Jun;45(3):432-8. Russian.
38. Kriventseva EV, Makeev VIu, Gel'fand MS. [Statistical analysis of the exon-intron structure of higher eukaryote genes]. Biofizika. 1999 Jul-Aug;44(4):595-600. Russian.
39. Kutuzova GI, Frank GK, Esipova NG, Makeev VIu, Polozov RV. [Periodicity in contacts of RNA-polymerase with promotors]. Biofizika. 1999 Mar-Apr;44(2):216-23. Russian.
40. Frank GK, Makeev VJ. G and T nucleotide contents show specie-invariant negative correlation for all three codon positions. J Biomol Struct Dyn. 1997 Apr;14(5):629-39.
41. Kutuzova GI, Frank GK, Makeev VIu, Esipova NG, Polozov RV. [Fourier analysis of nucleotide sequences. Periodicity in E. coli promoter sequences]. Biofizika. 1997 Mar-Apr;42(2):354-62. Russian.
42. Makeev V.Ju, Tumanyan VG. Search of periodicities in primary structure of biopolymers: a general Fourier approach. Comput Appl Biosci. 1996, 12:49-54.
43. Makeev VIu, Frank GK, Tumanian VG. [Statistics of periodic regularities in sequences of human introns]. Biofizika. 1996 Jan-Feb; 41(1):241-6. Russian.
44. Makeev V.Ju, Tumanyan VG, Esipova NG. The third nucleotide of the Gly coding triplet remembers the periodicity of the collagen chain. FEBS Lett. 1995; 366(1):33-6.