

# Arsen Arakelyan

## CURRICULUM VITAE

### Personal Information

Full name: Arsen Arakelyan  
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Yerevan  
Phone: +37410 440566  
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Year of Birth: 10 Feb 1979  
Place of Birth: Yerevan, Armenia  
Citizenship: Republic of Armenia  
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### Current Work Details

Position: Senior Researcher, Head of Group  
Degree: PhD  
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**U.S. permanent residence from 15 November 2014**

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### Education

1995-1999 **Bachelor's degree in Biochemistry**  
*Specialization: Biochemistry*  
Faculty of Biology, Yerevan State University

1999-2001 **Master's degree in Biochemistry**  
*Specialization: Biochemistry*  
Faculty of Biology, Yerevan State University

2001-2004 **PhD in Biology**  
*Specialization: Molecular and Cellular Biology*  
Institute of Molecular Biology of the National Academy of Sciences of the Republic of Armenia (NAS RA)

### Professional Experience

*Permanent Positions:*

2015-to date	<b>Director</b> Institute of Molecular Biology NAS RA, Armenia
2011-to date	<b>Group Leader</b> Research Group of Bioinformatics Institute of Molecular Biology NAS RA, Armenia
2011-to date	<b>Senior Researcher</b> Research Group of Bioinformatics Institute of Molecular Biology NAS RA, Armenia
2008-2014	<b>Deputy Director</b> Institute of Molecular Biology NAS RA, Armenia
2007-2011	<b>Researcher</b> Laboratory of Macromolecular Complexes Institute of Molecular Biology, NAS RA, Armenia
2006-2007	<b>Visiting scientist</b> Laboratory of Immunogenomics Palacky University, Czech Republic
2004-2006	<b>Researcher</b> Laboratory of Macromolecular Complexes Institute of Molecular Biology, NAS RA, Armenia
2001-2004	<b>Junior researcher</b> Laboratory of Macromolecular Complexes Institute of Molecular Biology, NAS RA, Armenia
1998-2001	<b>Research assistant</b> Laboratory of Macromolecular Complexes Institute of Molecular Biology, NAS RA, Armenia

*Part-time Positions:*

2015-to date	<b>Head of Department</b> Department of Bioengineering and Bioinformatics of the Institute of Mathematics and High-Technologies of the Russian-Armenian(Slavonic) University
2014-to date	<b>Adjunct Lecturer</b>

*Undergraduate General Education Courses:*

*F100 level course – Introduction to Biosciences*

*F200 level course – Quantitative Biology*

American University of Armenia (affiliated with the University of California, see

<http://aua.am/accreditation-affiliations/>)

2012-to date

**Lecturer**

*Graduate Courses:*

*Introduction to Bioinformatics*

*Introduction to Biostatistics*

Department Molecular and Cellular Biology

International Scientific-Educational Center of NAS RA

2009-to date

**Co-Principal Investigator**

Joint project "Laboratory of Information Biology"

Institute of Molecular Biology and the Institute for Informatics and Automation

Problems of NAS RA

2007-2012

**Lecturer**

*Graduate Courses:*

*Applications of Biotechnology*

*Introduction to Biostatistics*

Department of Biotechnology

International Scientific-Educational Center of NAS RA

## Research Experience and Technical Skills

Bioinformatics skills  
and tools

Protein modeling, biostatistics, high-throughput gene expression analysis, signal processing, image processing, primer design, association analysis, BLAST, NAMD, VMD, PyMol, ClusPro, MODELLER, SPDBV, CytoScape, GO tools, MATLAB  
Bioinformatics tools, GSEA

Bioinformatics  
packages developed/  
contributed

**KEGGParser: parsing and editing KEGG pathway maps in Matlab**

<http://www.mathworks.com/matlabcentral/fileexchange/37561-keggparser--parsing-and-editing-kegg-pathway-maps-in-matlab>

**Geometric Gaussian-Kernel Bolstered Error Estimation for Linear Classification**

<http://www.mathworks.com/matlabcentral/fileexchange/40118-geometric-gaussian-kernel-bolstered-error-estimation-for-linear-classification>

**CyKEGGParser: a Cytoscape app for parsing and automatic corrections of KEGG pathway maps**

<http://apps.cytoscape.org/apps/cykeggparser>

**Computel: R based software for computation of mean telomere length of NGS Whole Genome Sequencing data**

<https://github.com/lilit-nersisyan/computel>

Laboratory skills	DNA isolation, PCR-SSP, qRT-PCR, ELISA, flow cytometry, PAGE/WB, Sanger Sequencing
Programming skills	C, Matlab 6.0-10.0, R, little experience with Python Matlab FileExchange Submission: 6 files, 73 + 23 downloads last 30 days (two different accounts: <a href="http://www.mathworks.com/matlabcentral/fileexchange/authors/13183">http://www.mathworks.com/matlabcentral/fileexchange/authors/13183</a> <a href="http://www.mathworks.com/matlabcentral/fileexchange/authors/89768">http://www.mathworks.com/matlabcentral/fileexchange/authors/89768</a>
Statistical tools	SPSS, GraphPad Prism
Languages	Russian – fluent, English – fluent, Czech - fair, Armenian - native

## Honors/Awards

2015	<b>Most productive scientists in the year 2014</b> Awarded by the State Committee of Science of the Ministry of Education and Science of the Republic of Armenia
2013	<b>Most productive scientists in the year 2012</b> Awarded by the State Committee of Science of the Ministry of Education and Science of the Republic of Armenia
2013	<b>Winner of the Young Scientists Competition "Best Scientific Work 2013", Section of Biology</b> Awarded by the National Academy of Sciences of the Republic of Armenia, the World Armenian Congress, the Union of Armenians in Russia, and Ministry of Diaspora of the RA
2012	<b>Award for publications with the highest citations in international peer-reviewed journals</b> Awarded by the "Tashir" Foundation and "Young Scientists Support" Initiative, Armenia

- 2011 **Award for impact factor publications**  
Awarded by "Gagik Tsarukyan" Foundation and "Young Scientists Support" Initiative, Armenia
- 2011 **Invitation to the 61<sup>st</sup> Meeting of Nobel Laureates in Lindau as a Young Researcher**  
Council for the Lindau Nobel Prize Laureate Meetings, Germany
- 2010 **Award for best scientific development (3<sup>rd</sup> class diploma)**  
Awarded by the "Development of education, science and health" Foundation, Russian Federation
- 2010 **Award for the best presentation at the Young Scientists School "Bioinformatics and Systems Biology"**  
Awarded by the Young Scientists School Organizing Committee, Russian Federation

## Research grants/awards

- 2015-2017 **Assessment of the impact of genomic and epigenetic alterations on gene expression and biological pathway activation in cancers**  
*Role in project: Principle investigator*  
Grant of the State Committee of Science RA (15T-1F150)
- 2013-2015 **Analysis of biomolecular pathways involved in complex human diseases**  
*Role in project: Principle investigator*  
Grant of the State Committee of Science RA (13YR-1F0022)
- 2014 **Multiclass growing support set algorithm for analysis of high-throughput gene expression data**  
*Role in project: Principle investigator*  
Grant of the Armenian National Science and Education Fund, ANSEF, USA (molbio-3507)
- 2011-2013 **In silico structure-function characterization of Familial Mediterranean fever gene product (pyrin): insights into disease pathogenesis**  
*Role in project: Principle investigator*  
Grant of the State Committee of Science RA (11B-1f014)
- 2012 **Express test-system for diagnostics of overtraining syndrome**  
*Role in project: Principle investigator*  
Grant of the Ministry of Economics of RA and Civilian Research and Development

Foundation, USA (CRDF-9070)

2011

**Growing support sets for pathway specific microarray gene expression analysis**

*Role in project: Principle investigator*

Grant of the Armenian National Science and Education Fund, ANSEF, USA (NS-molbio-2319)

## Academic Fellowships and Visits

2013	DAAD Research Stay Award
2008	Cardiff University International Collaboration Award, UK
2005	Royal Society International Joint Project Award, UK
2003, 2004	INTAS NIS Young Scientist Fellowship, EU

## Additional Professional Activities & Membership

### *Membership in associations and societies:*

2012-to date	The Protein Society
2012-to date	The International Society for Computational Biology (ISCB)
2010-to date	European Respiratory Society
2010-to date	European Academy for Allergy and Clinical Immunology
2010-to date	International Brain Research Organization (IBRO)
2008-to date	Armenian Federation of Biochemists Affiliated to FEBS

### *Evaluation activities:*

2014-to date	Reviewer of Computational and Structural Biotechnology Journal
2013-to date	Reviewer of PLOS One journal
2013-to date	Expert of the State Committee of Science of the Republic of Armenia
2010-to date	Expert of the Commercialization Reactor Events, Lativa

## Supervision of graduate students

Supervision of 10 graduate projects

## Patents

Boyadjyan A., Khoyetsyan A., Arakelyan A. Method for schizophrenia diagnostics. AM 2347, G01N 33/48, 2010-01-25

## Publications (2004-2014)

Book chapters: 4; Papers in refereed journals: 61; Communications to scientific meetings: 37

### Selected publications

#### Book chapters

1. **Arakelyan A**, Nersisyan L, Hakobyan A. Application of MATLAB in -Omics and Systems Biology. Applications from Engineering with MATLAB Concepts, Associate Prof. Jan Valdman (Ed.), ISBN: 978-953-51-2459-7. InTech, Croatia, 2016. DOI: 10.5772/62847.
2. **Arakelyan A**, Aslanyan L, Boyajyan A. High-throughput Gene Expression Analysis Concepts and Applications. Sequence and Genome Analysis II – Bacteria, Viruses and Metabolic Pathways. ISBN: 978-1-480254-14-5. iConcept Press Ltd, USA , 2013, 71-95  
<http://www.iconceptpress.com/books/sequence-and-genome-analysis-ii--bacteria-viruses-and-metabolic-pathways>
3. Boyajyan A, **Arakelyan A**, Ayvazyan V. Chapter 5. Lipoprotein-X in diseases. In: Handbook of lipoprotein research (Editor: J.E. Rathbond), Nova Science Publishers Inc., USA, 2011, 109-124
4. **Arakelyan A**, Boyajyan A, Sahakyan H, Aslanyan L, Ivanova K, Mitov I. Growing support set systems in analysis of high-throughput gene expression data. In: New trends in classification and data mining (Editors: K. Markov, V. Ryazanov, V. Velychko, L. Aslanyan), Sofia: ITHEA, 2010, 47-53.
5. Di Napoli M, **Arakelyan A**, Boyajyan A, Godoy A, Papa F. Chapter III: The acute phase inflammatory response in stroke: systemic inflammation and neuroinflammation. In: Progress in Inflammation Research (Editor: J. A. Pitzer), Nova Science Publishers Inc., USA, 2005, 95-145.

#### Articles

1. Atshemyan S, Chavushyan A, Berberian N, Sahakyan A, Zakharyan R, **Arakelyan A**. Characterization of BRCA1/2 mutations in patients with family history of breast cancer in Armenia [version 1; referees: 1 approved]. F1000Research 2017, 6:29. doi: 10.12688/f1000research.10434.1.
2. **Arakelyan A**, Nersisyan L, Petrek M, Löffler-Wirth H, Binder H. Cartography of Pathway Signal Perturbations Identifies Distinct Molecular Pathomechanisms in Malignant and Chronic Lung Diseases. Front. Genet. 2016. 6;7:79. doi: 10.3389/fgene.2016.00079.
3. Hakobyan A, Nersisyan L, **Arakelyan A**. Quantitative trait association study for mean telomere length in the South Asian Genomes. Bioinformatics 2016. doi: 10.1093/bioinformatics/btw027
4. Hopp L., Nersisyan L., Löffler-Wirth H, **Arakelyan A**, Binder H. Epigenetic heterogeneity of B-cell lymphoma: Chromatin modifiers. Genes 2015, 6(4):1076-1112.
5. Nersisyan L, Johnson G, Riel-Mehan M, Pico A, **Arakelyan A**. PSFC: a Pathway Signal Flow Calculator App for Cytoscape [version 1; referees: 1 approved] F1000Research 2015, 4:480.

6. Nersisyan L, Arakelyan A. Computel: computation of mean telomere length from whole-genome next-generation sequencing data. *PLoS One*. 2015;10(4):e0125201.
7. Nersisyan L, Löffler-Wirth H, **Arakelyan A**, Binder H. Gene Set- and Pathway- Centered Knowledge Discovery Assigns Transcriptional Activation Patterns in Brain, Blood, and Colon Cancer: A Bioinformatics Perspective. *International Journal of Knowledge Discovery in Bioinformatics (IJKDB)* 2014, 4(2):46-49.
8. Binder H, Wirth H, **Arakelyan A**, Lembcke K, Tiys ES, Ivanisenko VA, Kolchanov NA, Kononikhin A, Popov I, Nikolaev EN, Pastushkova L, Larina IM. Time-course human urine proteomics in space-flight simulation experiments. *BMC Genomics*. 2014; 15 Suppl 12:S2.
9. Nersisyan L, Samsonyan R, **Arakelyan A**. CyKEGGParser: tailoring KEGG pathways to fit into systems biology analysis workflows. Version 2. *F1000Res*. 2014 Jul 1 [revised 2014 Aug 14];3:145. doi: 10.12688/f1000research.4410.2. eCollection 2014.
10. **Arakelyan A**, Nerisyan L, Gevorgyan A, Boyajyan A. Geometric approach for Gaussian-Kernel bolstered error estimation for linear classification in computational biology. *Information Theories and Applications*, 2014, 21(2), 170-181.
11. **Arakelyan A**, Zakharyan R, Hambardzumyan M, Petrakova J, Olsson MC, Petrek M, Boyajyan A. Functional genetic polymorphisms of monocyte chemoattractant protein 1 and C-C chemokine receptor type 2 in ischemic stroke. *J Interferon Cytokine Res*. 2014 Feb;34(2):100-5. doi: 10.1089/jir.2013.0030. Epub 2013 Oct 1.
12. Kolkova Z, **Arakelyan A**, Casslen B, Hansson S, Kriegova E. Normalizing to GAPDH jeopardises correct quantification of gene expression in ovarian tumours - IPO8 and RPL4 are reliable reference genes. *J Ovarian Res*. 2013 Aug 30;6(1):60. doi: 10.1186/1757-2215-6-60.
13. Ktsoyan ZA, Beloborodova NV, Sedrakyan AM, Osipov GA, Khachatryan ZA, Manukyan GP, Arakelova KA, Hovhannisyan AI, **Arakelyan AA**, Ghazaryan KA, Zakaryan MK, Aminov RI. Management of familial Mediterranean fever by colchicine does not normalize the altered profile of microbial long chain fatty acids in the human metabolome. *Front Cell Infect Microbiol*. 2013 Jan 28;3:2. doi: 10.3389/fcimb.2013.00002. eCollection 2013.
14. **Arakelyan A**, Nersisyan L. KEGGParser: parsing and editing KEGG pathway maps in Matlab. *Bioinformatics*. 2013 Feb 15;29(4):518-9. doi: 10.1093/bioinformatics/bts730. Epub 2013 Jan 3.
15. Nersisyan L, Arakelyan A. In silico structure characterization of Familial Mediterranean fever gene product (pyrin). *IPCBE* 2012; 29: 40-44.
16. Zakharyan R, Petrek M, **Arakelyan A**, Mrazek F, Atshemyan S, Boyajyan A. Interleukin-6 promoter polymorphism and plasma levels in patients with schizophrenia. *Tissue Antigens*. 2012 Aug;80(2):136-42. doi: 10.1111/j.1399-0039.2012.01886.x. Epub 2012 May 10.
17. Zakharyan R, Boyajyan A, **Arakelyan A**, Melkumova M, Mrazek F, Petrek M. Monocyte chemoattractant protein-1 in schizophrenia: -2518A/G genetic variant and protein levels in Armenian population. *Cytokine*. 2012 Jun;58(3):351-4. doi: 10.1016/j.cyto.2012.02.013. Epub 2012 Mar 17.



18. Zakharyan R, Khoyetsyan A, **Arakelyan A**, Boyajyan A, Gevorgyan A, Stahelova A, Mrazek F, Petrek M. Association of C1QB gene polymorphism with schizophrenia in Armenian population. *BMC Med Genet.* 2011 Sep 28;12:126. doi: 10.1186/1471-2350-12-126.
19. **Arakelyan A**, Zakharyan R, Khoyetsyan A, Poghosyan D, Aroutiounian R, Mrazek F, Petrek M, Boyajyan A. Functional characterization of the complement receptor type 1 and its circulating ligands in patients with schizophrenia. *BMC Clin Pathol.* 2011 Aug 25;11:10. doi: 10.1186/1472-6890-11-10.
20. Zakharyan R, Boyajyan A, **Arakelyan A**, Gevorgyan A, Mrazek F, Petrek M. Functional variants of the genes involved in neurodevelopment and susceptibility to schizophrenia in an Armenian population. *Hum Immunol.* 2011 Sep;72(9):746-8. doi: 10.1016/j.humimm.2011.05.018. Epub 2011 May 24.
21. Zakharyan R, Chavushyan A, Khoyetsyan A, Stahelova A, **Arakelyan A**, Boyajyan A, Mrazek F, Petrek M. Genetic variants of the inflammatory C-reactive protein and schizophrenia in Armenian population: a pilot study. *Int J Immunogenet.* 2010 Oct;37(5):407-10. doi: 10.1111/j.1744-313X.2010.00942.x. Epub 2010 Jun 21.
22. Ktsoyan ZA, Beloborodova NV, Sedrakyan AM, Osipov GA, Khachatryan ZA, Kelly D, Manukyan GP, Arakelova KA, Hovhannisyan AI, Olenin AY, **Arakelyan AA**, Ghazaryan KA, Aminov RI. Profiles of Microbial Fatty Acids in the Human Metabolome are Disease-Specific. *Front Microbiol.* 2011 Jan 20;1:148. doi: 10.3389/fmicb.2010.00148. eCollection 2010.
23. **Arakelyan A**, Kriegova E, Kubistova Z, Mrazek F, Kverka M, du Bois RM, Kolek V, Petrek M. Protein levels of CC chemokine ligand (CCL)15, CCL16 and macrophage stimulating protein in patients with sarcoidosis. *Clin Exp Immunol.* 2009 Mar;155(3):457-65. doi: 10.1111/j.1365-2249.2008.03832.x.
24. Manukyan L, Boyajyan A, **Arakelyan A**, Ayvazyan V, Arakelova E, Sim R, Grigoryan G. Immunochemical composition of cryoglobulins generated in stroke. *J Clin Immunol.* 2009 May;29(3):274-81. doi: 10.1007/s10875-008-9257-5. Epub 2008 Nov 4.
25. Kubistova Z, Mrazek F, Lympany PA, Lagan AL, **Arakelyan A**, Kriegova E, Welsh KI, Kolek V, Zatloukal J, Hutyrova B, du Bois RM, Petrek M. The CR1 C5507G polymorphism is not involved in susceptibility to idiopathic pulmonary fibrosis in two European populations. *Tissue Antigens.* 2008 Nov;72(5):483-6. doi: 10.1111/j.1399-0039.2008.01133.x.
26. Kriegova E, **Arakelyan A**, Fillerova R, Zatloukal J, Mrazek F, Navratilova Z, Kolek V, du Bois RM, Petrek M. PSMB2 and RPL32 are suitable denominators to normalize gene expression profiles in bronchoalveolar cells. *BMC Mol Biol.* 2008 Jul 31;9:69. doi: 10.1186/1471-2199-9-69.
27. Mrazek F, Kvezereli M, Garr E, Kubistova Z, Kriegova E, Fillerova R, **Arakelyan A**, Ruven HJ, Drabek J, van den Bosch JM, Kolek V, Welsh KI, Grutters JC, du Bois RM, Petrek M. Complement receptor 1 single nucleotide polymorphisms in Czech and Dutch patients with sarcoidosis. *Tissue Antigens.* 2008 Jan;71(1):77-80. Epub 2007 Nov 10.
28. Kriegova E, Tsyrlunyk A, **Arakelyan A**, Mrazek F, Ordeltova M, Petzmann S, Zatloukal J, Kolek V, du Bois RM, Popper H, Petrek M. Expression of CCX CKR in pulmonary sarcoidosis. *Inflamm Res.* 2006 Oct;55(10):441-5.

29. Cermakova Z, Petrkova J, **Arakelyan A**, Drabek J, Mrazek F, Lukl J, Petrek M. The MCP-1 -2518 (A to G) single nucleotide polymorphism is not associated with myocardial infarction in the Czech population. *Int J Immunogenet.* 2005 Oct;32(5):315-8.
30. **Arakelyan A**, Petrkova J, Hermanova Z, Boyajyan A, Lukl J, Petrek M. Serum levels of the MCP-1 chemokine in patients with ischemic stroke and myocardial infarction. *Mediators Inflamm.* 2005 Aug 14;2005(3):175-9.