

DAVID BURSTEIN

The Department of Cell Research and Immunology
George S. Wise Faculty of Life Sciences
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EDUCATION

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| 2008 to date | Ph.D. Studies under the supervision of Prof. Tal Pupko, Department of Cell Research and Immunology, Tel Aviv University |
| 2006 – 2008 | M.Sc. in the Bioinformatics track (<i>summa cum laude</i>) under the supervision of Prof. Tal Pupko. Department of Cell Research and Immunology, Tel Aviv University |
| 2001 – 2004 | B.Sc. in Biology (<i>summa cum laude</i>) and Computer Science (<i>magna cum laude</i>) , Tel Aviv University. Double major program with a specialization in Bioinformatics |

TEACHING EXPERIENCE

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| 2009 - 2012 | Instructor of the course "Perl Programming for Biology", Tel Aviv University (responsible for the entire course from design to grading) <i>for which I received awards from the Tel-Aviv Graduate school</i> |
| 2007 – 2009 | Instructor of the course "Biological Sequences Analysis", Tel Aviv College (responsible for the entire course from design to grading) |
| 2007 – 2008 | Teaching assistant in the course "Introduction to Bioinformatics" in Tel Aviv University (Lectured in recitations, created and graded assignments) <i>for which I received awards from the Tel-Aviv Graduate school</i> |
| 2005 – 2006 | Teaching assistant in the course "Algorithms in Computational Biology", the Concentrated M.Sc. Track in Computer Science, Tel Aviv University (designed and graded assignments) |

AWARDS & HONORS

2013	Rothschild post-doctoral fellowship (for studies abroad)
2012	Training scholarship for Ph.D. students - The Aharon Katzir Center, Weizmann Institute of Science
2012	Prof. Willy Hirsch Prize for original research work conducted in the field of microbiology (awarded by the Israel Society for Microbiology)
2012	Outstanding poster award - the 20 th Annual International Conference on Intelligent Systems for Molecular Biology (ISMB), Long Beach, California
2012	Outstanding poster award – The 14 th Israeli Bioinformatics Symposium, Hebrew University of Jerusalem
2012	Best poster award – The Seventh Edmond J. Safra Bioinformatics Retreat
2012	The Anat Krauskopf Fund Travel Award
2010	Best poster award - The Annual Meeting of the Israel Society for Microbiology (ISM)
2010	Best poster award – The Fifth Edmond J. Safra Bioinformatics Retreat
2009 - 2013	Excellence Scholarship from Converging Technologies Program of the Israeli Council for Higher Education
2009	Best poster award – The 12 th Israeli Bioinformatics Symposium, Weizmann Institute of Science
2008	Wolf Foundation Award for excellent M.Sc. students (nation-wide prize)
2008	Award from the Tel Aviv University graduate school for excellent achievements in teaching, research and studies
2006 - 2009	Excellence scholarship from Edmond J. Safra Bioinformatics Program
2003 - 2004	Exact Science Dean's honour list
2002 and 2004	Life Science Dean's honour list

PUBLICATIONS

- Yosef I., Shitrit D., Goren M.G., Burstein D., Pupko T., and Qimron U. DNA motifs determining the efficiency of protospacer adaptation into the *Escherichia coli* CRISPR array. *Proceedings of the National Academy of Sciences USA*. Under revision.
- [1] Cohen O., Ashkenazy H., Karin E.L., Burstein D., and Pupko T. CoPAP: Co-evolution of Presence-Absence Patterns. ***Nucleic Acids Research*** (Web Server issue). *In press*.
- [2] Lifshitz Z.*, Burstein D.*, Peeri M., Zusman T., Schwartz K., Shuman H. A., Pupko T., and Segal G. Computational modeling and experimental validation of the *Legionella* and *Coxiella* virulence-related Type IVB secretion signal. ***Proceedings of the National Academy of Sciences USA*** 110(8):E707-705 (2013)
* These authors contributed equally
- [3] Cohen, O., Ashkenazy, H., Burstein, D., and Pupko, T. Uncovering the co-evolutionary network among microbial gene families. ***Bioinformatics*** 28 ECCB 2012:i389-i394 (2012)
- [4] Burstein D.*, Gould S.B.*, Zimorski V., Klösge T., Kiosse F., Major P., Martin W., Pupko T., and Dagan T. A machine-learning approach to identify hydrogenosomal proteins in *Trichomonas vaginalis*. ***Eukaryotic Cell*** 11:217-228 (2012)
* These authors contributed equally
- [5] Amit M., Donyo M., Hollander D., Goren A., Kim E., Gelfman S., Lev-Maor G., Burstein D., Schwartz S., Postolsky B., Pupko T., and Ast G. Differential GC content between exons and introns establishes distinct strategies of splice site recognition. ***Cell Reports*** (2012) 1(5):543-556.
- [6] Gelfman S., Burstein D., Penn O., Schwartz S., Pupko T., and Ast G. Changes in exon-intron structure during vertebrate evolution affect the splicing pattern of exons. ***Genome Research*** 22(1):35-50 (2012)
- [7] Barzel A., Privman E., Peeri M., Naor A., Shachar E., Burstein D., Lazary R., Gophna U., Pupko T., and Kupiec M. Native homing endonucleases can target conserved genes in humans and in animal models. ***Nucleic Acids Research*** 39(15):6646-6659 (2011)
- [8] Burstein D., Zusman T., Degtyar E., Viner R., Segal G., and Pupko T. Genome-scale identification of *Legionella pneumophila* effectors using a machine learning approach. ***PLoS Pathogens*** 5(7):e1000508 (2009)
- [9] Schwartz S., Silva J., Burstein D., Pupko T., Eyraas E., and Ast G. Large scale comparative analysis of splicing signals and their corresponding splicing factors in eukaryotes. ***Genome Research*** 18(1):88-103 (2008)
- [10] Ulitsky I., Burstein D., Tuller T., Chor B. The ACS approach to phylogenomic reconstruction. ***Journal of Computational Biology*** 13(2):336-50 (2006)

PATENTS

- Barzel, A., Privman, E., Burstein, D., Gophna, U., Pupko, T., and Kupiec, M. 2009. Method for searching for homing endonucleases, their genes and their targets. International patent No. PCT/IL2009/000172.

SELECTED ORAL PRESENTATIONS

- Burstein D., Lifshitz Z., Peeri M., Zusman T., Segal G., and Pupko T. Deciphering the translocation signal of the virulence-related type-IVB secretion system. *The First Tel Aviv University – Freie Universität Berlin Joint Workshop (TAU-FUB)*. March 4-7, 2013, Tel Aviv, Israel
- Burstein D., Zusman T., Peeri M., Lifshitz Z., Segal G., and Pupko T. Fishing for virulent factors: machine learning prediction and experimental validation of bacterial effectors. *20th Annual Conference on Intelligent Systems for Molecular Biology (ISMB)*. July 15-17, 2012, Long Beach, California, USA
- Burstein D., Peeri M., Zusman T., Lifshitz Z., Segal G., and Pupko T. Fishing for virulent factors: machine learning prediction and experimental validation of bacterial effectors. *IBM research seminar*. June 10, 2012, IBM Research Haifa, Israel.
- Burstein D., Zusman T., Lifshitz Z., Peeri M., Segal G., and Pupko T. Machine learning approaches to identify and characterize effector proteins in pathogenic bacteria. *Israel Society for Microbiology (ISM) Annual Meeting*. February 13-14, 2012, Bar-Ilan University, Israel. *Prize lecture for original research conducted in the field of microbiology*
- Burstein D., Gould S.B., Zimorski V., Klösge T., Kiosse F., Major P., Martin W., Pupko T., and Dagan T. A machine-learning approach to hydrogenosomal protein identification in *Trichomonas vaginalis*. *Machine Learning in Systems Biology (MLSB)*. July 20-11, 2011, Vienna, Austria
- Burstein D., Gould S.B., Zimorski V., Klösge T., Henze K., Martin W., Pupko T., and Dagan T. A machine-learning approach to hydrogenosomal protein identification in *Trichomonas vaginalis*. *Seminar in the Department of Ecology and Evolution, University of Lausanne*. July 14, 2011, Lausanne, Swiss
- Burstein D., Gould S.B., Zimorski V., Klösge T., Henze K., Martin W., Pupko T., and Dagan T. A machine learning approach to genome-scale identification of proteins targeted to the hydrogenosome in *Trichomonas vaginal*. *Institute of Botany III seminar, Heinrich Heine University of Düsseldorf*. July 13, 2010, Düsseldorf, Germany
- Burstein D., Ulitsky I., Tuller T., and Chor B. Information theoretic approaches to whole genome phylogenomics. *The 9th Annual International Conference on Research in Computational Molecular Biology (RECOMB)*. May 14-18, 2005, Cambridge, Massachusetts, USA

SELECTED POSTER PRESENTATIONS

- Burstein D., Zusman T., Peeri M., Lifshitz Z., Segal G., and Pupko T. Fishing for virulent factors: machine learning prediction and experimental validation of bacterial effectors. *20th Annual Conference on Intelligent Systems for Molecular Biology (ISMB)*. July 15-17, 2012, Long Beach, California, USA. won outstanding poster award
- Burstein D., Gould S.B., Zimorski V., Klösge T., Kiosse F., Major P., Martin W., Pupko T., and Dagan T. Computational Prediction and Experimental Validation of Hydrogenosomal Proteins Coded in the Nuclear Genome of *Trichomonas vaginalis*. *Annual Meeting of the Society for Molecular Biology and Evolution (SMBE)*. June 23-26, 2012, Dublin, Ireland
- Burstein D., Peeri M., Zusman T., Lifshitz Z., Segal G., and Pupko T. Fishing for virulent factors: machine learning prediction and experimental validation of bacterial effectors. *The 14th Israeli Bioinformatics Symposium (IBS)*. June 7, 2012, Hebrew University of Jerusalem, Israel. won outstanding poster award
- Burstein D., Gould S.B., Zimorski V., Klösge T., Henze K., Martin W., Pupko T., and Dagan T. Machine learning approach to identify and characterize effector proteins in pathogenic bacteria. *19th Annual Conference on Intelligent Systems for Molecular Biology (ISMB) and 10th European Conference on Computational Biology (ECCB)*. July 17-19, 2011, Vienna, Austria
- Burstein D., Zusman T., Degtyar E., Viner R., Segal G., and Pupko T. Genome-scale identification of *Legionella pneumophila* effectors using a machine learning approach. *The Israeli Society for Microbiology (ISM) annual meeting*. February 16-17, 2010, Bar Ilan University, Israel. won best poster award
- Burstein D., Zusman T., Degtyar E., Viner R., Segal G., and Pupko T. Genome-scale identification of *Legionella pneumophila* effectors using a machine learning approach. *The 12th Israeli Bioinformatics Symposium (IBS)*. April 6, 2009, Weizmann Institute of Science, Israel. won best poster award
- Burstein D., Segal G., and Pupko T. Predicting secreted virulent proteins based on evolutionary signatures. *Annual Meeting of the Society for Molecular Biology and Evolution (SMBE)*. June 5-8, 2008, Barcelona, Spain

RESEARCH GRANTS EXPERIENCE

- Assisted Prof. Pupko with **United States-Israel Binational Science Grant (BSF)** (2010 – 2013), Grant title: "*Identification and Characterization of Coxiella burnetii Effector Proteins*" Helped designing and writing the application, and progress reports.
- Assisted Prof. Pupko with **Israel Ministry of Science and Technology, Infrastructure grant** (2010 – 2013). Grant title: "Identification of virulent proteins in bacterial pathogens using machine learning". Helped designing and writing the application, and progress reports.

INVOLVEMENT IN THE COMMUNITY AND NON-ACADEMIC ACTIVITIES

2010 – 2011	Volunteering as a high school tutor in the Israeli Computer Science Unplugged program
2004 – 2007	Kindergarten teacher assistant for children of ages 1.5 – 3
2001 – 2004	Caregiver in a residential home for adults diagnosed with autism, ALUT – The Israel National Autism Association
2001	Manager of an English summer school for new immigrants, The Israel Association of Community Centres
1996 – 2000	Obligatory military service in Israeli defense force. Rank: Lieutenant. <i>Officer ranks granted with honour.</i>