

Elhanan Borenstein

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Web: <http://borensteinlab.com/>

Education

- 2000 – 2006 **Ph.D. with distinction, Computer Science, Tel-Aviv University**
(w/ 1 yr recess) Evolutionary Dynamics of Adaptive Populations: The Effect of Phenotypic Plasticity, Imitation and Culture on Evolution; Prof. Eytan Ruppin's Lab
GPA: 99/100
- 1994 – 1996 **B.Sc. Summa Cum Laude, Physics and Computer Science, Tel-Aviv Univ'**
Program for the Fostering of Excellence (outstanding students special program)
GPA: 97/100

Postgraduate Training

- 2007 – 2009 **Postdoctoral Fellow, Stanford University** (with Prof. Marc Feldman)
- 2007 – 2009 **Omidyar Fellow, Santa Fe Institute** (with Prof. David Krakauer)

Additional Training:

- April 2006 Evolutionary and Ecological Genomics, Ben-Gurion University of the Negev
- Aug-Sep 2005 Research residency, Philip Steinmetz Fellow, Santa Fe Institute
- Jan 2005 Biological Networks & Evolution, The Hebrew Univ', Inst' for Advanced Studies
- Jun 2004 Complex Systems Summer School, Santa Fe Institute

Faculty Positions

- 10/2018 – present **Associate Professor, Sackler Faculty of Medicine, Tel Aviv University**
- 10/2018 – present **Associate Professor, Blavatnik School of Computer Science, Tel Aviv University**
- 12/2019 – present **Affiliate Professor, Genome Sciences, University of Washington**
- 07/2014 – 09/2019 **Adjunct Associate Professor, Computer Science and Engineering, UW**
- 07/2014 – 09/2019 **Associate Professor, Genome Sciences, University of Washington**
- 07/2011 – present **External Professor, Santa Fe Institute**
- 05/2011 – 06/2014 **Adjunct Assistant Professor, Computer Science and Engineering, UW**
- 12/2009 – 06/2014 **Assistant Professor, Genome Sciences, University of Washington**

Additional Affiliations:

- 2018 – present Director, BioMed @ TAU Research Hub, Microbiomes in Health and Disease
- 2018 – present Faculty Fellow, Edmond J. Safra Center for Bioinformatics, Tel Aviv University
- 2017 – 2019 Environmental Pathology/Toxicology training program, UW
- 2016 – 2019 Big Data for Genomics and Neuroscience training program, UW
- 2014 – 2019 IGERT Program in Big Data and Data Science, UW
- 2010 – 2019 Computational and Molecular Biology Interdisciplinary Program, UW
- 2010 – 2019 Molecular and Cellular Biology Graduate Program, UW

Advisory Boards & Consulting

- 2019 – present **Edmond J. Safra Center for Bioinformatics, TAU**, steering Committee

2017 – present	Seres Therapeutics , Scientific Advisory Board
2017 – 2019	Northwest Institute for Advanced Computing , Steering Committee
2016 – present	Phase Genomics , Scientific Advisory Board
2016	Celgene , Consulting
2015 – 2019	Pacific Northwest National Laboratory , Microbiomes in Transition (MinT), External Advisory Committee

Honors, Fellowships & Awards

2018	Faculty Fellow, Edmond J. Safra Center for Bioinformatics , Tel Aviv University
2012 – 2017	NIH Director's New Innovator Award (\$1,500,000)
2016	Keynote Speaker, NIH , The 2nd HIV and the Microbiome Workshop
2011 – 2013	Alfred P. Sloan Research Fellowship in molecular biology (two-year fellowship for outstanding early-career scientists, \$50,000)
2012	UW nominee for Pew Biomedical Scholars Award
2011	Keynote speaker, NIH , Annual MSM consortium meeting
2011 – present	Faculty of 1000 Member , Genomics & Genetics
2011	UW nominee for Searle Scholars Program
2007 – 2009	Omidyar Fellowship , Santa Fe Institute
2007 – 2009	Postdoctoral Fellowship , Stanford University
2005	Philip Steinmetz Fellowship , Santa Fe Institute
2005	Best Teacher , School of Computer Science, Tel-Aviv University
2004 – 2006	Yeshaya Horowitz Association Scholarship in Complexity Science (three years research grant for Ph.D. students, \$22,000 per year)
2004	Aharon Katzir Center Training Fellowships for Ph.D. , Weizmann Institute
2004	The Don & Sara Marejn Scholarship for Outstanding Ph.D. Student
2004	School of Computer Science Award for Ph.D. Student , Tel-Aviv University
2004	Travel Scholarships: ALIFE9 Student Scholarship, CSSS Scholarship (SFI)
2003	Best Teaching Assistant Prize , School of Computer Science, Tel-Aviv Univ'
1996	B.Sc. Summa Cum Laude (graduated first in the class, GPA 97)
1994 – 1996	Dean's List (3 years)
1994 – 1996	Program for the Fostering of Excellence (Three year merit-based stipend and scholarship, Tel-Aviv University)

Teaching Experience

Regularly obtaining top scores in teaching evaluations with high praises from both students and teaching colleagues. Teaching evaluations available upon request.

Courses Taught – Tel-Aviv University

2020, B	0368-1105-08: Extended Introduction to Computer Science
2019, B	0368-3116-01: Seminar in Computational Methods in Metagenomics and Microbiome Research

Courses Mentored – Tel-Aviv University

- 2020, A-B **0368-2101-01:** Seminar - Topics in Bioinformatics 2,3
 2020, A-B **0368-1101-01:** Seminar - Topics in Bioinformatics 1

Guest Lectures – Tel-Aviv University

- Mar 2020 Topic in Bioinformatics 1
 Dec 2019 First steps in research for outstanding students in computer science
 Jun 2019 Computer Science Bsc excellent program (2nd year)
 Mar 2019 Microbial Ecology course, Life Sciences
 Mar 2019 Bioinformatics track (1st year) in Computer Science and Life Sciences
 Dec 2018 First steps in research for outstanding students in computer science
 Dec 2018 The combined program for Life sciences and computer science with specialization in bioinformatics
 Dec 2018 The Edmond J. Safra Young Researchers' Forum

Courses Taught - University of Washington:

- Spring 2018 **GENOME 373:** Genomic Informatics; [with D. Fowler]
 Instructor (responsible for 15 contact hrs/5 weeks)
 Winter 2018 **GENOME 559:** Intro' to Statistical and Computational Genomics; [with W. Noble]
 Instructor (responsible for 15 contact hrs/5 weeks)
 Spring 2017 **GENOME 373:** Genomic Informatics; [with D. Fowler]
 Instructor (responsible for 15 contact hrs/5 weeks)
 Winter 2017 **GENOME 559:** Intro' to Statistical and Computational Genomics; [with J. Thomas]
 Instructor (responsible for 15 contact hrs/5 weeks)
 Spring 2016 **GENOME 373:** Genomic Informatics; [with D. Fowler]
 Instructor (responsible for 15 contact hrs/5 weeks)
 Winter 2016 **GENOME 559:** Intro' to Statistical and Computational Genomics; [with J. Thomas]
 Instructor (responsible for 15 contact hrs/5 weeks)
 Spring 2015 **GENOME 373:** Genomic Informatics; [with D. Fowler]
 Instructor (responsible for 15 contact hrs/5 weeks)
 Winter 2015 **GENOME 559:** Intro' to Statistical and Computational Genomics; [with J. Thomas]
 Instructor (responsible for 15 contact hrs/5 weeks)
 Spring 2014 **GENOME 373:** Genomic Informatics; [with J. Thomas]
 Instructor (responsible for 15 contact hrs/5 weeks)
 Spring 2014 **GENOME 541:** Intro' to Computational Molecular Biology; [with multiple faculty]
 Co-instructor (responsible for 3 contact hrs/1 week)
 Winter 2014 **GENOME 559:** Intro' to Statistical and Computational Genomics; [with J. Thomas]
 Instructor (responsible for 15 contact hrs/5 weeks)
 Spring 2013 **GENOME 373:** Genomic Informatics; [with J. Thomas]
 Instructor (responsible for 15 contact hrs/5 weeks);
 Spring 2013 **GENOME 541:** Intro' to Computational Molecular Biology; [with multiple faculty]
 Co-instructor (responsible for 3 contact hrs/1 week)
 Winter 2013 **GENOME 559:** Intro' to Statistical and Computational Genomics; [with J. Thomas]
 Instructor (responsible for 15 contact hrs/5 weeks)
 Spring 2012 **GENOME 373:** Genomic Informatics; [with J. Shendure]

	Instructor (responsible for 15 contact hrs/5 weeks);
Spring 2012	GENOME 541: Intro' to Computational Molecular Biology; [with multiple faculty] instructor (responsible for 3 contact hrs/1 week)
Winter 2012	GENOME 559: Intro' to Statistical and Computational Genomics; [with J. Thomas] Instructor (responsible for 15 contact hrs/5 weeks)
Spring 2011	GENOME 541: Intro' to Computational Molecular Biology; [with multiple faculty] instructor (responsible for 3 contact hrs/1 week)
Winter 2011	GENOME 559: Intro' to Statistical and Computational Genomics; [with J. Thomas] Instructor (responsible for 15 contact hrs/5 weeks)
Spring 2010	GENOME 541: Intro' to Computational Molecular Biology; [with multiple faculty] instructor (responsible for 3 contact hrs/1 week)

Courses Mentored - University of Washington:

2010-2013 (7 quarters)	CSE 590C: Reading & Research in Computational Biology; [with multiple faculty] Co-mentor
2010- 2011 (2 quarters)	GENOME 580: Ethics in Biomedical Research & Teaching; [with multiple faculty] Guest session leader (2hr)
2010- 2016 (6 quarters)	GENOME 599B: Journal Club Preparation Co-mentor

Courses Taught - Tel-Aviv University (during graduate school):

Spring 2005	Object Oriented Programming Senior Lecturer (responsible for ~42 contact hrs/14 week)
Spring 2004	Object Oriented Programming Senior Lecturer (responsible for ~42 contact hrs/14 week)
Spring 2004	Artificial Life Workshop Teaching Assistant
Summer2003	Object Oriented Programming Lecturer (responsible for ~42 contact hrs/14 week)
Spring 2003	Object Oriented Programming Lecturer (responsible for ~42 contact hrs/14 week)
Spring 2003	Artificial Life Workshop Teaching Assistant
Fall 2004	Software 1 Teaching Assistant
Fall 2003	Software 1 Teaching Assistant

Summer Schools, Short Courses, Workshops:

Jun 2020	Complex Systems Summer School , Santa Fe Institute Lecture series on "Analyzing and modeling the human microbiome" (total 3 hrs)
Apr 2018	Biological Measurement Seminar, Nursing School , UW Lecture on "Systems-Biology of the Human Microbiome"
Jul 2017	Computational Genomics Summer Institute (CGSI) , UCLA Lecture of "Model-Based Analysis of Multi-Omic Microbiome Data"
Jun 2017	Complex Systems Summer School , Santa Fe Institute Lecture series on "Analyzing and modeling the human microbiome" (total 3 hrs)

- Jun 2016 **Complex Systems Summer School**, Santa Fe Institute
Lecture series on “Model-based analysis of Microbial Communities” (total 3 hrs)
- Apr 2014 **Keystone Symposium**, Montana, USA
Workshop on "Reconstructing and Analyzing Metabolic Networks"
- Jun 2013 **Complex Systems Summer School**, Santa Fe Institute
Lecture series on “Models of Microbial Communities” (total 3 hrs)
- Jun 2012 **Complex Systems Summer School**, Santa Fe Institute
Lecture series on “Modeling Microbial Metabolism” (total 4.5 hrs)

Mentoring and Trainees:

Postdoctoral Fellows:

- 2019 **Cecilia Noecker** (*now postdoctoral fellow at UCSF*)
Genome Sciences, University of Washington
Project: Integrative analysis of multi-meta-omic data
- 2019 – present **Alex Eng**
Genome Sciences, University of Washington
Project: Algorithms for synthetic microbial community design
- 2015 – 2018 **Adrian Verster** (*now Bioinformatician at Health Canada*)
Project: Microbial warfare in the gut microbiome
NSERC Postdoctoral Fellowship
- 2013 – 2016 **Ohad Manor** (*now Senior Research Scientist at Arivale, USA*)
Project: Model-based computational methods for comparative metagenomics
- 2014 – 2014 **Jody Wright** (*now Director of Comm & Engagement, Clear Seas, Canada*)
Project: Modeling microbial interaction networks in the human microbiome
- 2011 – 2015 **Hsuan-Chao Chiu** (*now Senior Software Engineer at MediaTek, Taiwan*)
Project: Metabolic models of multi-species systems
- 2011 – 2014 **Rogan Carr** (*now Senior Data Scientist at Microsoft, USA*)
Project: Computational deconvolution of metagenomic data

Additional Postdoctoral Mentoring:

- 2014 – 2015 **Attila Kertesz-Farkas**, University of Washington (Career Advisor)
- 2014 – 2017 **Eric Libby**, Omidyar fellow, Santa Fe Institute (External Advisor)

Ph.D. Students:

- 2019 – present **Michal Harpaz**, Clinical Microbiology and Immunology, Tel-Aviv University
Project: The impact of the gut microbiome on *Wnt* signaling and colorectal cancer (Joint with Prof. Rina Arbesfeld)
- 2019 – present **Yadid Algavi**, MD-PHD Program, Tel-Aviv University
Project: Computational study of the stomach microbiome in gastroparesis
- 2019 – present **Efrat Muller**, Computer Science, Tel-Aviv University
Project: Integrative analysis of microbiome, metabolome, and diet information
Safra Center for Bioinformatics PhD Fellowship
- 2014 – 2019 **Cecilia Noecker**, Genome Sciences, University of Washington
Project: Integrative analysis of multi-meta-omic data
IGERT Big Data Fellowship (2014-2017)
Winner of UCSF MPhD training grant (2019)
- 2014 – 2019 **Alex Eng**, Genome Sciences, University of Washington

- Project: Algorithms for synthetic microbial community design
- 2014 – 2018 **Colin McNally**, Genome Sciences, University of Washington
Project: Modeling the evolution of mutualism in microbial communities
Genome Training Grant Fellowship (2014-2017)
- 2011 – 2016 **Maximilian Press**, Genome Sciences, University of Washington
Project: Co-Evolutionary inference of microbial genes' function
- 2010 – 2014 **Sharon Greenblum**, Genome Sciences, University of Washington
Project: Systems biology analysis of the human microbiome
Departmental nominee for the UW distinguished thesis award
- 2010 – 2015 **Roie Levy**, Molecular and Cellular Biology, University of Washington
Project: *In-silico* models of species interactions in microbial communities
NSF Graduate Fellowship (2011-2014)

M.Sc. Students:

- 2019 – present **Ran Armoni**, Computer Science, Tel-Aviv University
Project: Studying Healthy Microbiome Development
Safra Center for Bioinformatics PhD Fellowship
- 2019 – present **Or Segal**, Computer Science, Tel-Aviv University
Project: Constraint-based modeling of the gut microbiome
Safra Center for Bioinformatics PhD Fellowship
- 2019 – present **Yotam Cohen**, Computer Science, Tel-Aviv University
Project: Characterizing and Predicting the Impact of Dietary Fibers on the Gut Microbiome, Short Chain Fatty Acid Production, and Host Response
Safra Center for Bioinformatics MSc Fellowship

Doctoral and Master's Supervisory Committee:

- 2020 – present **Haya Abbas**, Faculty of Medicine (PhD), Tel Aviv University
- 2020 – present **Anton Levitan**, Faculty of Life Sciences (PhD), Tel Aviv University
- 2020 **Ariel Bruner**, School of Computer Science (MSc), Tel Aviv University
- 2020 **Rachelly Normand**, Faculty of Medicine (PhD), Technion
- 2020 **Naama Messika Gold**, Faculty of Medicine (MSc), Tel Aviv University
- 2020 **Or Kamara**, School of Computer Science (MSc), Tel Aviv University
- 2019 **Naama Wagner**, Mathematical & Theoretical Biology (MSc), Tel Aviv University
- 2019 **Jonatan Fernandes**, Faculty of Medicine (PhD), Technion
- 2019 – present **Itzhak Dangoor**, Faculty of Life Sciences (PhD), Tel Aviv University
- 2019 **Tamar Bendori**, School of Public Health (MSc), Tel Aviv University
- 2019 – present **Nitsan Zauzmer**, School of Medicine (PhD), Tel Aviv University
- 2019 **Hadas Biran**, Electrical and Electronic Engineering (MSc), Tel Aviv University
- 2019 **Gal Dinstag**, Computer Science (MSc), Tel Aviv University
- 2018 – 2019 **Joseph L Dempsey**, Environmental & Occupational Health Sciences, UW
- 2017 – 2020 **Maria Nelson**, Medical Scientist Training Program, University of Washington
- 2017 – 2019 **Sofiya Shevchenko**, Microbiology, University of Washington
- 2016 – 2019 **Helena van Tol**, Biological Oceanography, University of Washington
- 2016 – 2019 **John E. Lazar**, Genome Sciences, University of Washington
- 2016 – 2018 **Benjamin Fu**, Epidemiology - Public Health, University of Washington

2016 – 2019	Damon H. May , Genome Sciences, University of Washington
2015 – 2016	Mahsa Khorasani , Environmental/Forest Sciences, University of Washington
2015 – 2018	Aaron Goodman , Department of Biological Sciences, Stanford University
2015 – 2019	Moriah Echlin , Molecular and Cellular Biology, University of Washington
2015 – 2016	Gili Zilberman , Department of Immunology, Weizmann Institute of Science
2015 – 2019	Timothy Durham , Genome Sciences, University of Washington
2015 – 2015	Kaitlyn LaCourse , Microbiology (qualifying exam), University of Washington
2014 – 2019	Daniel Chee , Genome Sciences, University of Washington
2014 – 2014	Arend Voorman , Biostatistics, University of Washington
2013 – 2016	Rob Lawrence , Molecular and Cellular Biology, University of Washington
2013 – 2016	David Young , Medical Scientist Training Program, University of Washington
2011 – 2015	Katharine Marshall , School of Oceanography, University of Washington
2011 – 2015	Aaron Miller , Genome Sciences, University of Washington
2011 – 2012	Samuel Lancaster , Epidemiology, Fred Hutchinson Cancer Research Center
2010 – 2014	Jennifer Lachowiec , Molecular and Cellular Biology, University of Washington
2010 – 2014	Aaron Brooks , Molecular and Cellular Biology, University of Washington
2010 – 2012	Matthew Maurano , Genome Sciences, University of Washington

Rotation Students:

Winter 2017	April Lo , Genome Sciences, University of Washington Project: Codon usage bias in the microbiome data
Spring 2016	Ken Jean-Baptiste , Genome Sciences, University of Washington Project: Characterizing the landscape of 16S data
Winter 2016	Sarah Hilton , Genome Sciences, University of Washington Project: Co-variation in microbiome strains copy number
Winter 2014	Alexander Eng , Genome Sciences, University of Washington Project: Designing minimal microbial communities
Winter 2014	Cecilia Noecker , Genome Sciences, University of Washington Project: Dynamic co-occurrence network analysis in the gut microbiome
Autumn 2013	Seungsoo Kim , Genome Sciences, University of Washington Project: Genome-level comparative analysis of the human microbiome
Autumn 2013	Colin McNally , Genome Sciences, University of Washington Project: Modeling the evolution of mutualism
Winter 2013	Daniel Chee , Genome Sciences, University of Washington Project: Metagenomic co-occurrence.
Spring 2012	Jorgen Nelson , Genome Sciences, University of Washington Project: Genetic co-occurrence networks across metagenomic samples.
Autumn 2011	Brandon Blakeley , Computer Science and Engineering Project: Functional complementarity in co-occurring microbes.
Winter 2011	Benjamin Vernot , Genome Sciences, University of Washington Project: Associations between bacterial vaginosis clinical and genomic data.
Winter 2011	Maximilian Press , Genome Sciences, University of Washington Project: Applying expression profile analysis to study perturbed microbiomes.

- Autumn 2010 **Josh Burton**, Genome Sciences, University of Washington
Project: A framework for metabolic modeling of multi-species systems.
- Autumn 2010 **Alexander Nuttle**, Genome Sciences, University of Washington
Project: Transitions in the developing infant gut microbiome.
- Winter 2010 **Sharon Greenblum**, Genome Sciences, University of Washington
Project: Phylogenetic and functional modularity in microbial communities.
- Winter 2010 **Roie Levy**, Molecular and Cellular Biology, University of Washington
Project: The effect of environmental switching on the evolution of modularity
- Spring 2010 **Caitlin Connelly**, Genome Sciences, University of Washington
Project: Modularity and capacitance in gene interaction networks

Undergraduate Students, Summer Students, and Outreach:

- 2019 – 2019 **Ran Armoni**, Undergraduate Researcher, Tel Aviv University
Project: Association of the vaginal microbiome and Female Sexual Function
- 2019 – present **Betty Drozdinsky**, Undergraduate Researcher, Tel Aviv University
Project: Matrix factorization of multi-omic microbiome data
- 2019 – present **Karni Bar-Or**, Undergraduate Researcher, Tel Aviv University
Project: Predicting live vs. dead origin of metagenomic reads
- 2019 – present **Omri Peleg**, Undergraduate Researcher, Tel Aviv University
Project: Imputing missing values in longitudinal microbiome data
- 2017 – 2018 **Nicholas Tolley**, Undergraduate Researcher, University of Washington
Project: Scaling laws in the human microbiome
- 2014 – 2015 **Sierra Anderson**, Undergraduate Researcher, University of Washington
Project: A pipeline for comparative metagenomic analysis
- Summer 2014 **Jameson Boslough**, UW Amgen Scholars Program
Project: Species-focused methods for comparative metagenomics
- Spring 2014 **Lane Felker**, Undergraduate Researcher, University of Washington
Project: A software package for metagenomics annotation
- Summer 2013 **Clara Amorosi**, UW Amgen Scholars Program
Project: Scaling laws in the gut microbiome
- Summer 2010 **Lovenoor Aulck**, Genomics Outreach program, University of Washington
Project: Topological properties of gut dwelling microbes

National Service

Editorial Positions:

- 2017 – present **Editorial Board**, *Microbiome*
- 2016 – present **Associate Editor**, *PLOS Computational Biology*
- 2015 **Invited Editor**, *mBio*
- 2013 **Guest Editor**, *PLoS Computational Biology*

Reviewer for Journals:

Science, *Cell*, *PNAS (Proc. Natl. Acad. Sci. USA)*, *Nature Review Genetics*, *Nature Review Microbiology*, *Nature Biotechnology*, *Nature Microbiology*, *Nature Methods*, *Nature Communications*, *Genetics*, *Cell Host and Microbe*, *Cell Systems*, *PLOS Biology*, *Genome Biology*, *Genome Research*, *Genome Medicine*, *Cell Metabolism*, *PLOS Computational Biology*, *Microbiome*, *Current Opinion in Systems Biology*, *Evolution*, *Journal of Evolutionary Biology*, *Microbiology and Molecular Biology Review (ASM)*, *International Society for Microbial Ecology*

Journal (ISMEJ), Scientific Reports, Molecular Biology and Evolution, Journal of the Royal Society Interface, BMC Bioinformatics, BMC Systems Biology, BMC Evolutionary Biology, Evolutionary Ecology, Nucleic Acids Research, BioSystems, Oikos, Ecological Modelling, Artificial Intelligence, Neurocomputing, Cognitive Science, Artificial Life, Bioinformatics, Journal of Theoretical Biology, Theoretical Population Biology

Reviewer for Conferences:

The 16th Annual International Conference on Research in Computational Molecular Biology (RECOMB 2012), RECOMB Regulatory Genomics & Systems Biology 2009, Pacific Symposium on Biocomputing (PSB 2009), The 10th Annual International Conference on Research in Computational Molecular Biology (RECOMB 2006), The 14th Annual International conference on Intelligent Systems for Molecular Biology (ISMB 2006), The 15th annual Computational Neuroscience meeting (CNS*2006), The 8th European Conference on Artificial Life (ECAL2005), The 9th International Conference on the Simulation and Synthesis of Living Systems (ALIFE9), The Computational Neuroscience meeting (CNS*2004)

Committees, Study Sections, and Others:

2020	Expert Reviewer , Israel Science Foundation (ISF)
2020	Organizing Committee , 2nd International Conference on Biomedical Informatics – Big Data in Medicine (Haifa, Israel)
2019	Promotion Committee , Open University, Israel
2019	Organizing Committee , Santa Fe Institute, “Macroecological Insights into Microbiome Resilience and Function” Working Group
2018	Organizing Committee , The International Conference on Microbiome Engineering (ICME 2018)
2017	Expert Reviewer , Novo Nordisk Foundation (NNF)
2017	NIH Panel Member . Modeling and Analysis of Biological Systems [MABS] Study Section
2014	Expert Reviewer , Novo Nordisk Foundation (NNF)
2013	Scientific Panel , NIH Human Microbiome Science: Vision for the Future
2013	Session Convener , American Society for Microbiology Meeting (ASM2013)
2013	Ad hoc grant reviewer , Provincia Autonoma di Trento, Grandi Progetti 2012
2012 – present	Authored multiple recommendations , Faculty of 1000, Genomics & Genetics
2012	Program Committee , 16th Annual International Conference on Research in Computational Molecular Biology (RECOMB2012)
2011	NIH/NSF Panel Member . DMS/NIGMS Study Section
2011 – present	Member , Population Modeling Group, Interagency Modeling and Analysis Group & Multi-Scale Modeling Consortium, NIH
2009	Program Committee , 17th annual International Conference on Intelligent Systems for Molecular Biology (ISMB) and 8th European Conference on Computational Biology (ECCB); Bioinformatics of Disease
2005	Program Committee , Memetic Theory in Artificial Systems and Societies (METAS 2005)

University and Departmental Service

Tel-Aviv University:

- 2020 Organizer, Workshop on Computational Tools for Microbiome Data Processing and Analysis, TAU Bioinformatics Unit
- 2020 Speaker, BioMed 2020, Open Day, Faculty of Medicine, TAU
- 2020 Co-organizer, TAU BioMed Mini symposium on: "Microbiome Research: New technologies, big data, and clinical applications"
- 2019 – present Member, University-Wide Presidential Development Committee
- 2019 – present Member, Faculty of Exact Sciences Committee on Faculty-Wide Engagement
- 2019/2020 Member, Faculty Search Committee, School of Computer Science
- 2019 – present Coordinator/supervisor, Bioinformatics BSc Track, School of Computer Science
- 2019 – present Chair, Computing Committee, School of Computer Science
- 2019 – present Member, Edmond J. Safra Center for Bioinformatics Steering Committee
- 2019 Director, BioMed @ TAU Research Hub, Microbiomes in Health and Disease
- 2019 Organizer, Sheba/TAU Microbiome Analysis Workshop
- 2018 Reviewer, Koret-Berkeley-Tel Aviv grants

University of Washington:

- 2018 Organizer, Wednesdays Evenings at the Genome, Public Lecture Series
- 2017 Organizer, Wednesdays Evenings at the Genome, Public Lecture Series
- 2016 Organizer, Wednesdays Evenings at the Genome, Public Lecture Series
- 2016 Reviewer, UW Center for Ecogenetics & Environmental Health (CEEH)
- 2015 Member, Curriculum Subcommittee for Graduate Course Revisions
- 2015 Member, Biomedical Informatics and Medical Education (BIME) Precision Medicine faculty Search
- 2015 Member, Genome Sciences Seminar Committee
- 2015 Organizer, Wednesdays Evenings at the Genome, Public Lecture Series
- 2014 Faculty, University of Washington Amgen Scholars Program
- 2014 Co-organizer, Wednesdays Evenings at the Genome, Public Lecture Series
- 2014 Genome Science, graduate program recruiting visits, introductory presentation
- 2013 Faculty recruitment for a joint GI/AID position, FHCRC
- 2013 Faculty, University of Washington Amgen Scholars Program
- 2013 Co-organizer, Genome Science Retreat
- 2012 Member, UW Cancer Innovation Group
- 2012 Co-organizer, Genome Science Retreat
- 2011 Reviewer, University of Washington, Royalty Research Funds
- 2011 Member, Genome Sciences Seminar Committee
- 2011 Member, Genome Sciences Faculty Search Committee
- 2010 Member, Genome Sciences Seminar Committee
- 2010 Genome Science, graduate program recruiting visits, introductory presentation
- Ongoing Participant in MCB graduate student recruitment
- Ongoing Participant in CSE graduate student recruitment and prospective students visit

Ongoing Participant in MSTP graduate student recruitment
 Ongoing Lunch presentations to first year students and outreach summer students

Stanford University:

2009 Co-organizer, Complex Networks Initiative
 2008 Co-organizer, CompBio Workgroup

Science Communication, Public Lectures, and Outreach:

2020 **Public lecture**, AI in Genomics Meetup, Tel Aviv, Israel
 2017 **Public lecture**, Bainbridge Island Open Mic Science, Bainbridge, USA
 2014 – 2015 **Content advisory Committee, Pacific Science Center**
 2015 **Host**, Ballard High school students visit
 2014 **Public lecture**, John Von Neumann Public Lecture Series in Complexity & Computation, University of Wisconsin, Madison, USA
 2014 **Public panel lecture**, Conversation about Diabetes, Pacific Northwest Diabetes Research Institute (PNDRI), Seattle, USA
 2011 **Public lecture**, Wednesdays at the Genome, UW, Seattle, USA

Research Funding

Data Science Grant (PI: Borenstein) **Total Direct Costs (Borenstein Lab): \$21,500**
AI and Data Science Center at TAU **Period: 5/2020-4/2021**
A Machine Learning-Based Framework for Correcting Batch Effects in Microbiome Data
 Role: Principle-Investigator

MOH 3-0000-15979 (PI: Borenstein) **Total Direct Costs (Borenstein Lab): ~\$100,000**
Ministry of Health **Period: 5/2020-4/2023**
Characterizing and Predicting the Impact of Dietary Fibers on the Gut Microbiome, Short Chain Fatty Acid Production, and Host Response
 Role: Principal Investigator

Blavatnik Grant (PI: Borenstein) **Total Direct Costs (Borenstein Lab): \$30,000**
Blavatnik Family Foundation **Period: 10/2019–9/2020**
Studying Branching Points in Healthy Microbiome Development
 Role: Principle-Investigator

ISF 2435/19 (PI: Borenstein) **Total Direct Costs (Borenstein Lab): ~\$290,000**
ISF - Personal Research Grant **Period: 10/2019–9/2023**
Data Imputation in Multi-Omic and Longitudinal Microbiome Studies
 Role: Principal Investigator

ISF 2894/19 (PI: Borenstein) **Total Direct Costs (Borenstein Lab): ~\$133,000**
ISF - New Faculty Equipment Grant **Period: 10/2019**
Computational research of human microbiome multi-omic datasets
 Role: Principal Investigator

R01 AI132441 (PI: Balkus) **Total Direct Costs (Borenstein Lab): ~\$268,000**
NIAID/NIH **Period: 1/14/2019–12/31/2023**
Impact of the vaginal microbiome on Chlamydia trachomatis acquisition
 This project utilizes molecular methods to evaluate associations between the presence of specific vaginal bacteria, their metabolites, and women's susceptibility to *C. trachomatis*, aiming to inform the development of innovative *C. trachomatis* prevention strategies.

Role: Co-Investigator

**U19 AG057377-01 (PI: Promislow)
NIA/NIH**

**Total Direct Costs (Borenstein Lab): ~\$615,000
Period: 9/1/2018–8/31/2023**

The Dog Aging Project: Genetic and Environmental Determinants of Healthy Aging in Companion Dogs

This project will create a nationwide long-term study of healthy aging in 10,000 companion dogs and will utilize a multi-omic approach to identify the genetic and environmental factors that influence healthy aging. It will further test the ability of a promising drug to increase healthspan and lifespan.

Role: Co-Investigator

**1R01GM124312-01 (PI: Borenstein)
NIGMS/NIH**

**Total Direct Costs (Borenstein Lab): \$800,000
Period: 8/1/2017–6/30/2021**

Metabolic model-based integrative study of the relationship between the gut microbiome, metabolome, and diet

This project aims to develop a suite of novel computational frameworks, integrating several metabolic modeling approaches with metagenomic, metabolomic, and dietary data, to elucidate the mechanisms underlying this complex interplay between gut microbiome, gut metabolites, and diet, ultimately obtaining a more mechanistic understanding of this complex system and informing future efforts for microbiome-based therapies and nutritional interventions.

Role: Principal Investigator

**1R01DK095869 (PI: Hoffman)
NIDDK/NIH**

**Total Direct Costs (Borenstein Lab): ~\$390,000
Period: 1/1/2015-12/31/2019**

The relationship of fecal microbiomes and nutritional status in CF

The goal of this project is to test the hypothesis that the compositions of the intestinal microbiomes of infants with CF correlate with gastrointestinal dysfunction and early growth parameters.

Role: Co-Investigator

**DP2 AT 007802-01 (PI: Borenstein)
NIH New Innovator Award**

**Total Direct Costs (Borenstein Lab): \$1,500,000
Period: 9/30/2012–9/29/2017**

A Computational Framework for Designing Microbiome Manipulation

Microbiome manipulation is an exciting clinical frontier with numerous promising medical applications. This project aims to develop a novel computational framework, integrating a predictive model of the microbiome and its impact on the host with optimization methods, for designing manipulations of the gut microbiome and for informing clinical intervention efforts.

Role: Principal Investigator

**U54OH007544-16 (PI: Fenske)
NIOSH**

**Total Direct Costs (Borenstein Lab): ~\$122,000
Period: 9/30/2016-9/29/2021**

The Healthy Dairy Worker Study (Pacific Northwest Agricultural Safety and Health Center)

This study will help identify priorities for preventative interventions and healthy host adaption to the dairy environment including infection control practices and understanding vulnerable worker populations in a research to practice (R2P) fashion.

Role: Co-Investigator

**R15 AI112985-01 (PI: Bucci)
NIH**

**Total Direct Costs (Borenstein Lab): \$40,000
Period: 2/5/2015-1/31/2018**

Mathematical modeling from Metagenomics: Minimizing risk of enteric diseases

The goal of this project is to combine recently developed and novel mathematical modeling tools with metabolic pathways inference and experimentation to predict the risk of enteric diseases and to prototype rationally designed fecal transplantation therapies to minimize it.

Role: Co-Investigator (subcontract)

**1136640 (PI: Belden/Harris)
NSF**

**Total Direct Costs (Borenstein Lab): \$15,000
Period: 9/1/2011-8/31/2015**

Dimensions: Collaborative Research: Diversity and symbiosis: examining the taxonomic, genetic, and functional diversity of amphibian skin microbiota

This study seeks to understand the regulation of microbial communities on the skin of amphibian species, and how they may limit infection by a chytrid fungus that has decimated many amphibian populations around the globe.

Role: Co-Investigator (subcontract)

BR2011-112 (PI: Borenstein)

Alfred P. Sloan Foundation

Total Direct Costs (Borenstein Lab): \$50,000

Period: 9/15/2011–9/15/2013

Computational Systems Biology and Reverse-Ecology of the Human Microbiome

This is an early-career fellowship for scientists and scholars of outstanding promise, awarded yearly in recognition of distinguished performance and a unique potential to make substantial contributions to various research topics.

Role: Principal Investigator

P30 DK 89507 (PI: Ramsey/Greenberg)

NIDDK/NIH

Total Direct Costs (Borenstein Lab): \$113,407

Period: 6/1/2012-5/31/2014

Computational tools for identifying compositional shifts in the CF gut microbiome

The aim of this pilot project is to develop a suite of novel computational methods for identifying associations between the composition of the microbiome and specific host phenotypes such as CF status and clinical parameters. These methods are especially tailored to identify subtle differences in highly-multidimensional data with a relatively small sample size

Role: Pilot Project Principal Investigator

OPP1098757 (PI: Rabinowitz)

Bill & Melinda Gate Foundation

Total Direct Costs (Borenstein Lab): \$8,442

Period: 11/1/2013-4/30/2015

Grand Challenges: *One House-One Health Approach to Child Growth and Development*

The aim of this application is to identify high-risk household microbiomes in developing countries by comparing human and animal gut microbiomes within households, and to explore whether resetting abnormal animal microbiomes improves the microbiome of children within the household.

Publications - (●): Corresponding author

Journal Papers

1. **Borenstein E** and Ruppin E. Enhancing Autonomous Agents' Evolution with Learning by Imitation. *Journal of Artificial Intelligence and the Simulation of Behavior (AISBJ)*, 1(4), 2003.
2. **Borenstein E** and Ruppin E. The Evolutionary Link between Mirror Neurons and Imitation: An Evolutionary Adaptive Agents Model. *Behavioral and Brain Sciences*, 28:2, 127-128, 2005.
3. (●) **Borenstein E** and Ruppin E. The Evolution of Imitation and Mirror Neurons in Adaptive Agents. *Cognitive Systems Research* (special issue on Epigenetic Robotics), 6(3), 229-242, 2005.
4. (●) **Borenstein E**, Kendal J, and Feldman MW. Cultural Niche Construction in a Metapopulation. *Theoretical Population Biology*, 70(1), 92-104, 2006.
5. (●) **Borenstein E**, Meilijson I, and Ruppin E. The Effect of Phenotypic Plasticity on Evolution in Multi-peaked Fitness Landscapes. *Journal of Evolutionary Biology*, 19(5), 1555-1570, 2006.
6. (●) **Borenstein E** and Ruppin E. Direct Evolution of Genetic Robustness in MicroRNA. *PNAS (Proc. Natl. Acad. Sci. USA)*, 103(17), 6593-6598, 2006.
7. (●) **Borenstein E***, Shlomi T*, Ruppin E, and Sharan R (*equal contribution). Gene Loss Rate: A Probabilistic Measure for the Conservation of Eukaryotic Genes. *Nucleic Acids Research*, 35(1), e7, 2007.
8. **Borenstein E**, Feldman MW, and Aoki K. Evolution of Learning in Fluctuating Environments: When Selection Favors Both Individual and Social Learning. *Evolution*, 62 (3), 586–602, 2008.

9. Kreimer A*, **Borenstein E***, Gophna U, and Ruppin E (*equal contribution). The Evolution of Modularity in Bacterial Metabolic Networks. *PNAS (Proc. Natl. Acad. Sci. USA)*, 105(19), 6976-6981, 2008.
10. Lehmann L, Foster KR, **Borenstein E**, and Feldman MW. Social and Individual Learning of Helping in Humans and Other Species. *Trends in Ecology & Evolution*, 23(12), 664-671, 2008.
11. (●) **Borenstein E**, Kupiec M, Feldman MW, and Ruppin E. Large-Scale Reconstruction and Phylogenetic Analysis of Metabolic Environments. *PNAS (Proc. Natl. Acad. Sci. USA)*, 105(38), 14482-14487, 2008.
 - Reviewed in Genome Biology, 9:239, 2008 (see media coverage)
 - Recommended by Faculty of 1000 Biology
 - Featured in Astrobiology Magazine, Science 2.0
12. (●) **Borenstein E** and Krakauer DC. An End to Endless Forms: Epistasis, Phenotype Distribution Bias, and Non-Uniform Evolution. *PLoS Computational Biology*, 4(10), 2008.
 - Featured in Nature Reviews Genetics, 9(12), 2008 (see media coverage)
13. (●) **Borenstein E** and Feldman MW. Topological Signatures of Species Interactions in Metabolic Networks. *Journal of Computational Biology*, 16(2), 191-200, 2009.
 - Featured in Stanford Report, Feb 25, 2009 (see media coverage)
 - Reviewed in Frontiers in Ecology & the Environment, April, 2009
14. Cai J, **Borenstein E**, Chen R, and Petrov DA. Similarly Strong Purifying Selection Acts on Human Disease Genes of All Evolutionary Ages. *Genome Biology and Evolution*, 1(1), 131-144, 2009.
15. Freilich S, Kreimer A, **Borenstein E**, Yosef N, Sharan R, Gophna U, and Ruppin E. Metabolic-Network Driven Analysis of Bacterial Ecological Strategies. *Genome Biology*, 10(6), 2009.
16. Freilich S, Kreimer A, **Borenstein E**, Gophna U, Sharan R, and Ruppin E. Decoupling Environment-Dependent and Independent Genetic Robustness across Bacterial Species. *PLoS Computational Biology*, 6(2), 2010.
17. Cai J, **Borenstein E**, and Petrov DA. Broker Genes in Human Disease. *Genome Biology and Evolution*, 2, 815-825, 2010.
18. (●) Carr R and **Borenstein E**. NetSeed: A network-based reverse-ecology tool for calculating the metabolic interface of an organism with its environment. *Bioinformatics*, 28(5), 734-735, 2012.
19. Pinho R, **Borenstein E**, and Feldman MW. Most networks in Wagner's model are cycling. *PLoS ONE*, 7(4), e34285, 2012.
20. (●) Greenblum S, Turnbaugh P, and **Borenstein E**. Metagenomic Systems Biology of the Human Gut Microbiome Reveals Topological Shifts Associated with Obesity and IBD. *PNAS (Proc. Natl. Acad. Sci. USA)*, 109(2), 594-599, 2012.
 - Featured in This Week in PNAS, "Obesity, IBD-related topologies in the human gut microbiome"
 - Featured in Nature Reviews Microbiology, 10(674), 2012, Genome Watch
 - Featured in UW Today
 - Featured in Microbe Magazine, American Society for Microbiology
 - Featured in The Seattle Times
21. Kreimer A, Doron A, **Borenstein E**, and Freilich S. NetCmpt: A network-based tool for calculating the metabolic competition between bacterial species. *Bioinformatics*, 28 (16), 2195-2197, 2012.

22. (●) Levy R and **Borenstein E**. Reverse Ecology: From systems to environments and back. *Advances in Experimental Medicine and Biology*, 751 (Evolutionary Systems Biology), 751, 329-345, 2012.
23. O’Roak BJ, Vives L, Girirajan S, Karakoc E, Krumm N, Coe BP, Levy R, Ko A, Lee C, Smith JD, Turner EH, Stanaway IB, Vernot B, Malig M, Baker C, Reilly B, Akey JM, **Borenstein E**, Rieder MJ, Nickerson DA, Bernier R, Shendure J, and Eichler EE. Sporadic autism exomes reveal a highly interconnected protein network of de novo mutations. *Nature*, 485, 246-250, 2012.
- Featured in Nature Reviews Genetics - see Fruits of exome sequencing for autism
 - Featured in The New York Times front page (see media coverage)
 - Featured in UW Today, "Autism mutations, scattered across genes, merge into network of interactions"
 - Recommended by Faculty of 1000 Biology
24. (●) **Borenstein E**. Computational systems biology and in silico modeling of the human microbiome. *Briefings in Bioinformatics*, 13(6), 769-780, 2012.
- Recommended by Faculty of 1000 Biology
25. (●) Neph S, Stergachis AB, Reynolds A, Sandstrom R, **Borenstein E**^{*}, and Stamatoyannopoulos JA^{*} (✉ co-corresponding authors). Circuitry and dynamics of human transcription factor regulatory networks. *Cell*, 150(6), 1274-1286, 2012.
26. O’Roak BJ, Vives L, Fu W, Egertson JD, Stanaway IB, Phelps IG, Carvill G, Kumar A, Lee C, Ankenman K, Munson J, Hiatt JB, Turner EH, Levy R, O’Day DR, Krumm N, Coe BP, Martin BK, **Borenstein E**, Nickerson DA, Mefford HC, Doherty D, Akey JM, Bernier R, Eichler EE, and Shendure J. Multiplex Targeted Sequencing Identifies Recurrently Mutated Genes in Autism Spectrum Disorders. *Science*, 338, 1619-1622, 2012.
27. (●) Greenblum S, Chiu HC, Levy R, Carr R, and **Borenstein E**. Towards a Predictive Systems-Level Model of the Human Microbiome: Progress, Challenges, and Opportunities. *Current Opinion in Biotechnology*, 24, 810-820, 2013.
28. (●) Press MO^{*}, Li H^{*}, Creanza N, Kramer G, Queitsch C, Sourjik V, and **Borenstein E**. Genome-Scale Co-Evolutionary Inference Identifies Functions and Clients of Bacterial Hsp90. *PLoS Genetics*, 9(7), 2013.
29. (●) Levy R, and **Borenstein E**. Metabolic Modeling of Species Interaction in the Human Microbiome Elucidates Community-Level Assembly Rules, *PNAS (Proc. Natl. Acad. Sci. USA)*, 110(31), 12804-12809, 2013.
- Featured in UW Today
 - Recommended by Faculty of 1000 Biology
 - Highlighted in Nature Medicine (Microbiome models, on computers and in lab dishes, see progress)
30. (●) Carr R, Shen-Orr SS, and **Borenstein E**. Reconstructing the Genomic Content of Microbiome Taxa through Shotgun Metagenomic Deconvolution, *PLoS Computational Biology*, 9(10), 2013.
- Recommended by Faculty of 1000 Biology
31. Hoffman LR, Pope CE, Hayden HS, Levy R, McNamara S, Jacobs MA, Rohmer L, Radey M, Heltshe SL, Ramsey BW, Brittnacher MJ, **Borenstein E**, and Miller SI. Escherichia Coli Dysbiosis Correlates with Gastrointestinal Dysfunction in Children with Cystic Fibrosis. *Clinical Infectious Diseases*, 58(3), 396-399, 2014.
32. (●) Levy R and **Borenstein E**. Metagenomic systems biology and metabolic modeling of the human microbiome: From species composition to community assembly rules, *Gut Microbes*, 5(2), 2014.

33. (●) Chiu HC, Levy R, and **Borenstein E**. Emergent Biosynthetic Capacity in Simple Microbial Communities. *PLoS Computational Biology*, 10(7), 2014.
 - Featured in Santa Fe Institute News
 - Featured in Nature Outlook (Therapeutic microbes to tackle disease)
34. (●) Manor O, Levy R, and **Borenstein E**. Mapping the inner workings of the microbiome: Genomic- and metagenomic-based study of metabolism and metabolic interactions in the human microbiome. *Cell Metabolism*, 20(5), 742-752, 2014.
 - Featured in *Genetic Engineering & Biotechnology News* (GEN)
35. (●) Carr R and **Borenstein E**. Comparative Analysis of Functional Metagenomic Annotation and the Mappability of Short Reads. *PLoS ONE*, 9(8), 2014.
36. Stergachis A, Neph A, Sandstrom R, Haugen E, Reynolds AP, Zhang M, Byron R, Canfield T, Stehling-Sun S, Lee K, Thurman RE, Vong S, Bates D, Neri F, Diegel M, Giste E, Dunn D, Vierstra J, Hansen R, Johnson AK, Sabo PJ, Wilken MS, Reh T, Treuting PM, Kaul R, Groudine M, Bender MA, **Borenstein E**, and Stamatoyannopoulos JA. Conservation of trans-acting networks during mammalian regulatory evolution. *Nature*, 515, 365-370, 2014.
 - Featured in Nature News & Views
 - Featured in Science Daily
37. (●) Lachowiec J, Lemus T, **Borenstein E***, and Queitsch C* (¥ co-corresponding authors). Hsp90 promotes kinase evolution. *Molecular Biology and Evolution*, 32(1), 91-99, 2015.
38. Waldor MK, Tyson G, **Borenstein E**, Ochman H, Moeller A, Finlay BB, Kong HH, Gordon JL, Nelson KE, Dabbagh K, and Smith H. Where next for microbiome research? *PLoS Biology*, 13(1), 2015.
 - Featured in *Genetic Engineering & Biotechnology News* (GEN)
39. Hormozdiari F, Penn O, Borenstein E, and Eichler E. The discovery of integrated gene networks for autism and related disorders. *Genome Research*, 25(1), 142-154, 2015.
40. (●) Manor O, and **Borenstein E**. MUSiCC: A marker genes based framework for metagenomic normalization and accurate profiling of gene abundances in the microbiome. *Genome Biology*, 16:53, 2015.
 - Featured in *Genetic Engineering & Biotechnology News* (GEN)
41. (●) Greenblum S, Carr R, and **Borenstein E**. Extensive strain-level copy number variation across human gut microbiome species. *Cell*, 160, 583-594, 2015.
 - Main feature on **Cell cover**
 - Altmetric score: 108 (in 99th percentile compared to all articles; in 98th percentile compared to all articles in Cell)
 - Featured in UW NewsBeat
 - Featured in *Genomeweb*
 - Featured in Science Daily
 - Featured in Biomedical Computation Review (Computing the Gut)
 - Featured in IEEE Pulse Magazine (Deciphering the Mysterious Microbiome)
42. (●) Levy R, Carr R, Kreimer A, Freilich S, and **Borenstein E**. NetCooperate: A network-based tool for inferring host-microbe and microbe-microbe cooperation. *BMC Bioinformatics*, 16:164, 2015.
43. (●) Noecker C and **Borenstein E**. Getting personal about nutrition. *Trends in Molecular Medicine*, 22(2), 83-85, 2016.

44. (●) Noecker C, Eng A, Srinivasan S, Theriot CM, Young VB, Jansson JK, Fredricks DN, and **Borenstein E**. Metabolic model-based integration of microbiome taxonomic and metabolomic profiles elucidates mechanistic links between ecological and metabolic variation. *mSystems*, 1:1, e00013-15, 2016.
 - mSystems Editor's Pick
 - Featured in IEEE Pulse Magazine (Deciphering the Mysterious Microbiome)
45. (●) Manor O, Levy R, Pope CE, Hayden HS, Brittnacher MJ, Carr R, Radey MC, Hager KR, Heltshe SI, Ramsey BW, Miller SI, Hoffman LR*, and **Borenstein E*** (¥ co-corresponding authors). Metagenomic evidence for taxonomic and functional dysbiosis in children with cystic fibrosis. *Scientific Reports*, 6:22493, 2016.
46. (●) Eng A and **Borenstein E**. An algorithm for designing minimal microbial communities with desired metabolic capacities. *Bioinformatics*, 32(13), 2016.
 - Featured in IEEE Pulse Magazine (Deciphering the Mysterious Microbiome)
47. (●) Press M, Queitsch C, **Borenstein E**. Evolutionary assembly patterns of prokaryotic genomes. *Genome Research*, 26(6), 826-833, 2016.
48. May DH, Timmins-Schiffman E, Mikan MP, Harvey HR, **Borenstein E**, Nunn BL, and Noble WS. An alignment-free 'metapeptide' strategy for metaproteomic characterization of microbiome samples using shotgun metagenomic sequencing. *Journal of Proteome Research*, 15(8), 2697-2705, 2016.
49. (●) Noecker C, McNally C, Eng A, and **Borenstein E**. High-Resolution and Accurate Characterization of the Human Microbiome. *Translational Research*, 179, 7-23, 2017.
50. Snijders AM, Langley SA, Kim YM, Brislawn CJ, Noecker C, Zink EM, Fansler SJ, Casey CP, Miller DR, Huang Y, Karpen GH, Celniker SE, Brown JB, **Borenstein E**, Jansson JK, Metz TO, and Mao JH. Influence of early life exposure, host genetics and diet on the mouse gut microbiome and metabolome. *Nature Microbiology*, 2, 16221, 2017.
 - Featured in Science Daily
 - Features in PNNL News
51. Mosites E, Sammons M, Otiang E, Eng A, Noecker C, Manor O, Hilton S, Mwangi T, Onyango C, Garland-Lewis G, Call DR, Njenga MK, Wasserheit J, Zambriski J, Walson J, Palmer G, Montgomery J, **Borenstein E**, Omoro R, and Rabinowitz P. Microbiome Sharing Between Children, Livestock and Household Surfaces in Western Kenya. *PLOS ONE*, 12(2), 2017.
52. (●) Manor O, and **Borenstein E**. Revised computational metagenomic processing uncovers hidden and biologically meaningful functional variation in the human microbiome. *Microbiome*, 5:19, 2017.
53. (●) Manor O and **Borenstein E**. Systematic characterization and analysis of taxonomic drivers of functional shifts in the human microbiome. *Cell Host and Microbe*, 21, 254-267, 2017.
 - Main feature on **Cell Host and Microbe cover**
 - Featured in **Science**, 356,6339, 2017; Mining microbes: Creating genomic tools to fight disease
 - Features in UW The Daily
 - Featured in UW NewsBeat
 - Featured in TechCrunch
 - Featured in Business Standard
 - Featured in FierceBiotech
 - Featured in Think Biome
 - Features in The Biome Buzz

- Featured in UW Accelerate
 - Recommended by Faculty of 1000 Biology
54. Whitney JC, Peterson SB, Kim J, Pazos M, Verster AJ, Radey MC, Kulasekara HD, Ching MQ, Bryant D, Goo YA, Surette MG, **Borenstein E**, Vollmer W, and Mougous JD. A Broadly Distributed Toxin Family Mediates Contact-Dependent Antagonism Between Gram-positive Bacteria. *eLife*. 6:e26938, 2017.
 55. (●) Verster AJ, Ross BD, Radey MC, Bao Y, Goodman A, Mougous JD, and **Borenstein E**. The Landscape of Type VI Secretion across Human Gut Microbiomes Reveals its Role in Community Composition. *Cell Host and Microbe*, 22, 411-419, 2017.
 - Featured in This Week in Microbiology (ASM Podcast), Covert Pathogenesis
 - Featured in UW Medicine | Newsroom
 56. Matamoros S, Hayden HS, Hager KR, Brittnacher MJ, Lachance K, Weiss EJ, Pope CE, Imhaus AF, McNally CO, **Borenstein E**, Hoffman LR, Miller SI. Adaptation of commensal proliferating *Escherichia coli* to the intestinal tract of young children with cystic fibrosis. *PNAS (Proc. Natl. Acad. Sci. USA)*, 115(7), 1605-1610, 2018.
 57. (●) McNally CP, Eng A, Noecker C, Gagne-Maynard WC, and **Borenstein E**. BURRITO: An interactive multi-omic tool for visualizing taxa-function relationships in microbiome data. *Frontiers in Microbiology*, 9:365, 2018.
 58. (●) Eng A and **Borenstein E**. Taxa-function robustness in microbial communities. *Microbiome*, 6:45, 2018.
 59. Rebollar EA, Gutiérrez-Preciado A, Noecker C, Eng A, Hughey M, Medina D, Walke JB, **Borenstein E**, Jensen RV, Belden LK, and Harris R. The skin microbiome of the Neotropical frog *Craugastor fitzingeri*: Inferring potential bacterial-host-pathogen interactions from metagenomic data. *Frontiers in Microbiology*, 9:466, 2018.
 60. (●) McNally C and **Borenstein E**. Metabolic Model-Based Analysis of the Emergence of Bacterial Cross-Feeding via Extensive Gene Loss. *BMC Systems Biology*, 12:69, 2018.
 61. (●) Verster A and **Borenstein E**. Competitive Lottery-Based Assembly of Selected Clades in the Human Gut Microbiome. *Microbiome*, 6:186, 2018.
 62. Lindefeldt M, Eng A, Darban H, Bjerkner A, Zetterström CK, Allander T, Andersson B, **Borenstein E**, Dahlin M, and Prast-Nielsen S. The Ketogenic Diet Influences Taxonomic and Functional Composition of the Gut Microbiota in Children with Severe Epilepsy. *npi Biofilms and Microbiomes*, 5:5, 2019.
 63. NIH wide microbiome workshop writing team. 2017 NIH-wide workshop report on “The Human Microbiome: Emerging Themes at the Horizon of the 21st Century”. *Microbiome*, 7:32, 2019.
 64. Nelson MT, Pope CE, Marsh R, Wolter DJ, Weiss EJ, Hager KR, Vo AT, Brittnacher MJ, Radey MC, Hayden HS, Eng A, Miller SI, **Borenstein E**, and Hoffman LR. Human and Extracellular DNA Depletion for Metagenomic Analysis of Complex Clinical Infection Samples Provides Optimized Viable Microbiome Profiles. *Cell Reports*, 26:8, 2019.
 - Recommended by Faculty of 1000 Biology
 65. (●) Eng A and **Borenstein E**. Microbial Community Design: Methods, Applications, and Opportunities. *Current Opinion in Biotechnology*, 58:117-128, 2019.
 66. Sharon G, Cruz NJ, Kang D, Gandal MJ, Wang B, Kim YM, Zink EM, Casey CP, Taylor BC, Lane CJ, Bramer LM, Isern NG, Hoyt DW, Noecker C, Sweredoski MJ, Moradian A, **Borenstein E**, Jansson J, Knight R, Metz TO, Lois C, Geschwind DH, Krajmalnik-Brown R, and Mazmanian SK. Human Gut Microbiota from Autism Spectrum Disorder Promote Behavioral Symptoms in Mice. *Cell*, 177:6, 1600-1618, 2019.
 - Featured in *The Guardian* (Autism symptoms replicated in mice after faecal transplants)
 - Featured in *The Economist* (More evidence that autism is linked to gut bacteria)

- Featured in *Science Magazine* (Gut bacteria may contribute to autism symptoms, mouse study finds)
 - Featured in *Caltech News*, *Neuroscience News*, *Tech Times*, *Science & Enterprise*, *Medical News Today*, *Genetic Engineering News*, *Medical Xpress*, *Gizmag*
 - Recommended by Faculty of 1000 Biology
67. (●) Ross BD, Verster AJ, Radey MC, Schmidtke DT, Pope CE, Hoffman LR, Hajjar AM, Peterson SB, **Borenstein E*** & Mougous JD* (¥ co-corresponding authors). Human gut bacteria contain acquired interbacterial defence systems. *Nature*, 575, 224-228, 2019.
- Featured in UW Medicine Newsroom
 - Featured in *Genetic Engineering & Biotechnology News*
 - Featured in *Science Daily*
 - Featured in *HHMI News*
 - Featured in *TAU Safra News*
 - Recommended by Faculty of 1000 Biology
68. (●) Noecker C, Chiu HC, McNally CP, and **Borenstein E**. Metabolic model-based evaluation of microbiome-metabolome association studies. *mSystems*, 4:6, e00579-19, 2019.
- Featured in Nature's "Technologies to watch in 2020"
69. (●) Hayden HS, Eng A, Pope CE, Brittnacher MJ, Vo AT, Weiss EJ, Hager KR, Martin B, Leung DH, Heltshel S, **Borenstein E***, Miller SI* & Hoffman LR* (¥ co-corresponding authors). Fecal dysbiosis in infants with cystic fibrosis is associated with early linear growth failure. *Nature Medicine*, 26, 215-221, 2020.
- Featured in UW Medicine Newsroom
 - Featured in *CF News Today*

Submitted

1. Maintenance Tobramycin Primarily Affects Untargeted Bacteria in the CF Sputum Microbiome.
2. (●) MetaLAFPA: A flexible, end-to-end, compute cluster-compatible metagenomic functional annotation pipeline.
3. Gastrointestinal factors associated with hospitalization in infants with cystic fibrosis in the first 12 months of life

Conference Papers and Other Publications

1. **Borenstein E** and Ruppin E. Enhancing Autonomous Agents' Evolution with Learning by Imitation. *Proceedings of AISB 2003 Convention: Cognition in Machines and Animals*, 2003.
2. **Borenstein E** and Ruppin E. Evolving Imitating Agents and the Emergence of a Neural Mirror System. *Proceedings of the Ninth International Conference on the Simulation and Synthesis of Living Systems (ALife IX)*, MIT Press, 146-151, 2004.
3. **Borenstein E** and Cline E. Cellular automata model of cystogenesis and tubulogenesis. *Proceedings of the Santa-Fe Institute Complex Systems Summer School*, June 2004.
4. **Borenstein E**, Kupiec M, *Feldman MW and Ruppin E*. Large-Scale Reconstruction and Analysis of Growth Environments. *Proceedings of the Eighth International Conference on Systems Biology (ICSB 2007)*, 2007.
5. **Borenstein E** and Feldman MW. Topological Signatures of Species Interactions in Metabolic Networks. *4th Annual RECOMB Satellite on Systems Biology*, 2008.

Abstracts and Posters

Upon request

Invited Talks

- Feb 2021 (upcoming) Human Genome Meeting 2021 (HGM2021), Tel Aviv, Israel
- Jul 2020 (upcoming) Workshop: "Computational challenges in very large-scale omics", UC Berkeley, CA, USA
- Jun 2020 (upcoming) Eighth Annual Broad-ISF Symposium, Cambridge, MA, USA
- Jun 2020 (upcoming) Life Sciences Departmental Seminar, Ben-Gurion University, Beer-Sheva, Israel
- May 2020 (upcoming) **2020 TAU Board of Governors meeting, Tel Aviv, Israel**
- Apr 2020 (upcoming) The 21st Israeli Bioinformatics Symposium (IBS2020), Jerusalem, Israel.
- Feb 2020 Federation of the Israel Societies for Experimental Biology (ILANIT/FISEB) Conference, Eilat, Israel
- Jan 2020 Symposium: "Microbiome Research: New technologies, big data, and clinical applications", Tel Aviv Israel
- Dec 2019 The 5th Conference of the Israel Society for Biotechnology Engineering (ISBE), Tel Aviv, Israel
- Dec 2019 UCSF-TAU Workshop in Computational Biology and Drug Discovery, Tel Aviv, Israel
- Nov 2019 8th French-Israeli Workshop on Foundation of Computer Science, Tel-Aviv, Israel
- Nov 2019 Bioclub Seminar, The Hebrew University of Jerusalem, Jerusalem, Israel
- Sep 2019 Danish-Israeli Scientific Workshop: The Future of AI Health, Tel Aviv, Israel
- Jul 2019 The 2nd Workshop of the Koret Berkeley-TAU Initiative (KBT), Tel Aviv, Israel
- Jun 2019 The Annual Meeting of Israeli Translational Medicine, Haifa, Israel
- May 2019 The Edmond J. Safra Center for Bioinformatics Retreat, Maagan, Israel
- May 2019 Macroecological Insights into Microbiome Resilience and Function, Santa Fe Institute, Santa Fe, USA
- Apr 2019 Department of Human Genetics and Biochemistry, Sackler School of Medicine, Tel-Aviv University, Tel-Aviv, Israel
- Mar 2019 Department of Electrical & Computer Engineering, Ben-Gurion University, Beer-Sheva, Israel
- Mar 2019 Department of Cell and Developmental biology, Sackler School of Medicine, Tel-Aviv University, Tel-Aviv, Israel
- Dec 2018 Eli Hurvitz Microbiome Israel Workshop: from Bench to Bedside, Safed, Israel
- Dec 2018 From Microbiomes to Living Systems, Tel-Aviv University, Tel-Aviv, Israel
- Nov 2018 **Keynote Speaker:** The International Conference on Microbiome Engineering (ICME2018), Boston, USA
- Jun 2018 The International Human Microbiome Congress, Killarney, Ireland
- Jun 2018 SLU Collaborative: Emerging Technologies, Seattle, USA
- Mar 2018 Microbiome: Hype and Hope, Fred Hutchinson Cancer Research Center, Seattle, USA
- Mar 2018 The Microbiome Seminar Series, NYU Langone Medical Center, NY, USA (cancelled due to illness)

- Mar 2018 Quantitative & Computational Biology, Princeton's Lewis-Sigler Institute for Integrative Genomics, Princeton, USA (cancelled due to illness)
- Mar 2018 Environmental Health Microbiome Initiative Boot Camp, Seattle, USA
- Mar 2018 **Keynote Speaker:** Virginia Mason's GI Nursing Summit, Seattle, USA
- Feb 2018 UCLA Microbiome Center, UCLA, Los Angeles, USA
- Jan 2018 Department of Environmental and Occupational Health Sciences, University of Washington, Seattle, USA
- Dec 2017 Microbiome Symposium: Microbiome-pathogen interactions in infectious disease, University of Washington, Seattle, USA
- Oct 2017 116th International Titisee Conference, "From pathogen evolution to microbiome dynamics", Black Forest, Germany
- Aug 2017 **NIH special workshop,** "The Human Microbiome: Emerging Themes at the Horizon of the 21st Century", Bethesda, USA
- Aug 2017 Ecological Society of America (ESA) meeting, Investigating structure-function relationships in microbial communities, Portland, USA
- Jul 2017 Society for Industrial Microbiology and Biotechnology Annual Meeting, Denver, USA
- June 2017 The Barcelona Debates on the Human Microbiome. From Microbes to Medicines, Barcelona, Spain
- May 2017 HIV Mucosal Immunology Group Annual Meeting, Seattle, USA
- May 2017 Rush University, Department of Immunity and Emerging Pathogens, Chicago, USA
- May 2017 The Novo Nordisk Foundation conferences, "Data-driven Biotechnology", Copenhagen, Denmark
- Mar 2017 Bainbridge Island's Open Mic Science, Bainbridge, USA
- Nov 2016 **Keynote Speaker:** The 2nd HIV and the Microbiome Workshop, NIH, Bethesda, USA
- Oct 2016 Individualizing Medicine 2016 Conference, Mayo Clinic, Rochester, MN, USA
- Jun 2016 Vanderbilt Genetics Institute, Vanderbilt University, Nashville, USA
- May 2016 Bioinformatics for the Microbiome Symposium, Stanford University, Stanford, USA
- Apr 2016 Vancouver Bioinformatics Users Group (VanBUG) Seminar Series, Vancouver, Canada
- Mar 2016 Genome Sciences Combi Seminars, University of Washington, Seattle, USA
- Jan 2016 Gut Microbiome Symposium, FHCRC, Seattle, USA
- Nov 2015 25th Annual Beckman Symposium on Microbiota in Health in Disease, Duarte, USA
- Oct 2015 SRI International, Bioinformatics Research Group, Menlo Park, USA
- Sep 2015 Cell Symposium on *Human Immunity and the Microbiome in Health and Disease*, Montreal, Canada
- Sep 2015 Multi-omics for Microbiomes Conference, Pacific Northwest National Laboratory, Kennewick, USA
- Jun 2015 CF Seminar Series, University of Washington, Seattle, USA
- Jun 2015 Gladstone Institutes, UCSF, San Francisco, USA
- May 2015 Center for Bioinformatics and Computational Biology, University of Maryland, College Park, USA
- Mar 2015 COBRA Workshop on Modelling Microbial Communities, Luxemburg
- Mar 2015 The American Society for Biochemistry and Molecular Biology (ASBMB) Annual

- Meeting, Boston, USA
- Mar 2015 Weizmann Institute of Science Systems Biology Conference, “two2many”, Rehovot, Israel
- Feb 2015 AAAS Symposium on Obesity and Microbiome, Jan Jose, CA, USA
- Feb 2015 Math Model Affinity Group, Fred Hutchinson Cancer Research Center, Seattle, USA
- Dec 2014 ECOFECT international colloquium on modeling infectious diseases (EMOTIONS 2014), Lyon, France
- Nov 2014 Conversation about Diabetes, Public Panel Talk, Pacific Northwest Diabetes Research Institute (PNDRI), Seattle, USA
- Nov 2014 Urban Ecology Research Laboratory, Department of Urban Design and Planning, University of Washington, Seattle, USA
- Oct 2014 Diabetes and the Microbiome Research Symposium, organized by ADA and JDRF, Washington, DC, USA (canceled)
- Sep 2014 ASM Conference on Beneficial Microbes, Washington, DC, USA
- Sep 2014 **John Von Neumann Public Lecture Series in Complexity & Computation**, University of Wisconsin, Madison, USA
- Aug 2014 META Center Symposium on Host-Microbe Systems Biology, *Modeling Our Microbial Selves*, University of Oregon, Eugene, USA
- May 2014 **Keynote Speaker:** Inland Northwest Genomics Research Symposium (INWGRS), Moscow, ID, USA
- May 2014 UW Diabetes and Metabolism Symposium, Seattle, USA
- Apr 2014 Keystone Symposium, Exploiting and Understanding Chemical Biotransformations in the Human Microbiome, Montana, USA
- Feb 2014 Lecture Series in Biomedical & Health Informatics, University of Washington, Seattle, USA
- Feb 2014 **The Henk van Verseveld lecture, Nature of Life (NOL) lecture series**, Department of Ecological Sciences, VU Amsterdam University
- Feb 2014 Genome Sciences Combi Seminars, University of Washington, Seattle, USA
- Jan 2014 University of Missouri, Department of Biological Sciences, Columbia, USA
- Nov 2013 Northwest Branch of the American Society for Microbiology meeting, Seattle, USA
- Aug 2013 Cystic Fibrosis Annual Retreat, University of Washington, Seattle, USA
- Jul 2013 IUPS Satellite Meeting on Multiscale Systems Biology, Buckinghamshire, UK
- May 2013 Mathematical tools for evolutionary systems biology, Banff International Research Station, Banff, Canada
- May 2013 American Society for Microbiology General Meeting (ASM2013), Denver, USA
- May 2013 Cell Symposium on *Microbiome and Host Health*, Lisbon, Portugal
- Feb 2013 Stanford University, Stanford, USA
- Feb 2013 VA Palo Alto Health Care System, Palo Alto, USA
- Nov 2012 META Center for Systems Biology, University of Oregon, Eugene, USA
- Jul 2012 Hopkins Marine Station Microbiology Course, Stanford University, Pacific Grove, USA
- Jun 2012 Santa Fe Institute, Santa Fe, USA
- May 2012 Diabetes and metabolism seminar series, Diabetes Research Center, UW, Seattle, USA

- Nov 2011 Institute of Ecology and Evolution (IE²), University of Oregon, Eugene, USA
- Oct 2011 **Keynote Speaker:** Multiscale Modeling Consortium Meeting, NIH, Rockville, USA
- Jul 2011 *Wednesdays at the Genome* (Public Lecture Series), UW, Seattle, USA
- May 2011 The 5th Computational Molecular Biology Spring Symposium, UW, Seattle USA
- Mar 2011 AACR-NCI Conference on Systems Biology: Confronting the Complexity of Cancer, La Jolla, USA
- Dec 2010 Next Generation Sequencing seminar, Department of Biology, UW, Seattle USA
- Jun 2010 Computational Biology Seminar Series, Fred Hutchinson Cancer Research Center, Seattle, USA
- May 2010 Genome Sciences Seminars, University of Washington, Seattle, USA
- Jul 2009 Complex Networks Initiative, Stanford University, USA
- Apr 2008 Workshop on *The Role of Variation in Cultural Change*, Santa-Fe Institute, USA
- Jul 2007 Santa-Fe Institute, Santa Fe, USA
- Nov 2006 Department of Computer Science (*Barash Group*), Ben-Gurion University, Israel
- Jun 2006 Department of Biological Chemistry (*Tawfik Group*), Weizmann Institute of Science, Israel
- Apr 2006 *Camp Evolution II: Evolutionary and Ecological Genomics*, Blaustein Institute for Desert Research, Ben-Gurion University of the Negev, Israel

Contributed Talks

- Apr 2015 International Human Microbiome Congress, Luxemburg
- Mar 2011 International Human Microbiome Congress, Vancouver, Canada
- Nov 2010 6th Annual RECOMB Satellite on Systems Biology, New York, USA
- Dec 2009 5th Annual RECOMB Satellite on Systems Biology, Boston, USA
- Oct 2008 4th Annual RECOMB Satellite on Systems Biology, Boston, USA
- Oct 2007 Biomedical Computation at Stanford (BCATS), Stanford, USA
- Oct 2007 **Plenary talk:** The 8th Int'l Conference on Systems Biology, Long Beach, USA
- Sep 2004 The 9th Int'l Conference on the Simulation and Synthesis of Living Systems, Boston, USA
- Apr 2003 The AISB 2003 Convention: Cognition in Machines and Animals, Aberystwyth, Wales

Media Coverage

- Gut microbe imbalance may stunt CF babies' growth, UW Medicine | Newsroom, February 2020
- Poor Gut Microbiota in Infants with CF Linked to Stunted Growth in 1st Year of Life, Study Suggests, Cystic Fibrosis News Today, February 2020
- **Therapeutic microbes to tackle disease, Nature, January 2020**
- **Technologies to watch in 2020, Nature, January 2020**
- Bacterial arms race may shape gut microbiome, UW Medicine | Newsroom, October 2019
- In Gut Microbiome's War of All against All, Many Acquire Foes' Defense Genes, Genetic Engineering & Biotechnology News, October 2019
- To Survive in the Human Gut, Bacteria Need Genetic "Passcode", HHMI News, October 2019

- Borenstein in Nature: Human gut bacteria 'steal' defense systems from other bacteria, Edmond J. Safra Center for Bioinformatics News, October 2019
- Autism symptoms replicated in mice after faecal transplants, May 2019
- More evidence that autism is linked to gut bacteria, The Economist, May 2019
- Gut bacteria may contribute to autism symptoms, mouse study finds, Science, May 2019
- Microbiome Transfer Sufficient to Induce Autism Phenotypes in Mice, Genetic Engineering & Biotechnology News, May 2019
- **Interview With a Scientist – Elhanan Borenstein: Metagenomics Systems Biology, Biomedical Beat, NIH, July 2018**
- In your gut, bacteria battle with ninja-like tactics, UW Medicine | Newsroom, September 2017
- **Mining microbes: Creating genomic tools to fight disease, Science, 356, 6339, May 2017**
- Covert Pathogenesis, This Week in Microbiology (ASM Podcast), May 2017
- FishTaco and Your Microbiome, UW Accelerate, February 2017
- Gut bacteria studies could combat associated imbalances like diabetes, UW The Daily, February 2017
- What's Up Bainbridge (podcast): Open Mic Science at the Treehouse with UW Professor Elhanan Borenstein on the Microbial Zoo, February 2017
- FishTaco and Type 1 Diabetes, Think Biome, January 2017
- The Bacterial Microbiome, and Fish Tacos, The Biome Buzz, January 2017
- FishTaco can analyze your microbiome before or after you eat a fish taco, TechCrunch, January 2017
- A new method reveals roles different bacteria play in microbiome imbalances linked to disease, UW News Beat, January 2017
- Genes, early environment sculpt the gut microbiome, Science Daily, November 2016
- Deciphering the Mysterious Microbiome, IEEE Pulse Magazine, September 2016
- External faculty highlight - Matrix, The newsletter for Santa Fe Institute researchers, May 2016
- **Computing the gut, Biomedical Computation Review, April 2016**
- Metagenomics Digs Up Microbiome Riches, Genetic Engineering and Biotechnology News (GEN), October 2015
- **Microbiome models, on computers and in lab dishes, see progress, Nature Medicine, June 2015**
- Analysis Highlights Strain Diversity in Gut Microbiome, GenomeWeb, January 2015
- Among gut microbes, strains, not just species, matter, UW News Beat, January 2015
- Mice in the ENCODE spotlight, Nature News & Views, November 2014
- New view of mouse genome finds many similarities, striking differences with human genome, Science Daily, November 2014
- When microbes join forces, useful new compounds emerge, Santa Fe Institute News, July 2014
- Ecological forces structure your body's personal mix of microbes, UW Today, July 2013
- Metagenomics with guts, Genome Watch, Nature Reviews Microbiology, 10(674), Oct 2012
- Digestive microbes work differently in fat, lean, The Seattle Times, Feb 2012
- Fruits of exome sequencing for autism, Nature Review Genetics, 13(6), 2012
- Autism mutations, scattered across genes, merge into network of interactions, UW Today, 2012

- Scientists link gene mutation to autism risk, *The New York Times* (front page), April 2012
- Audio Interview, *Microbe Magazine*, March 2012
- Gut microbe networks differ from norm in obese people, systems biology approach reveals, *UW Today & Science Daily*, 2012
- Reverse Ecology, *Astrobiology Magazine*, March, 2009
- Reconstructing Bacterial Environments From Millions Of Years Ago, *Science 2.0*, Feb 2009
- Reverse ecology uses genes to predict environment, *Frontiers in Ecology & the Environment*, 2009
- Reversing ecology reveals ancient environments, *Stanford Report & Science Daily*, 2009
- Network-based approaches for linking metabolism with environment, *Genome Biology*, 9:239, 2008
- Modelling the evolutionarily possible, *Nature Reviews Genetics*, 9(11), 2008
- Development puts an end to the evolution of endless forms, *Science Daily*, 2008
- Santa Fe Institute researcher figures out factors that make bacteria more modular, *Medical News Today*, 2008
- Factors that make bacteria more modular detailed, *Science Daily*, 2008

Professional Industry Positions

Extensive professional experience in the IDF and hi-tech industry, holding top professional and management positions.

2000 – 2001	Co-Founder and Chief Technology Officer, Gate42 Technologies Ltd.
1997 – 1999	Vice President Research & Development, Veon Ltd. (acquired by Philips Electronics in 2000)
1995 – 1996	Software Project Leader, Veon Ltd.
1993 – 1994	Software engineer, Efrat Technologies (now Comverse)
Military service	Lieutenant, Section head, HM"N Talpiot (an elite R&D unit, Israel Defense Forces)

Patents (with other co-inventors)

- System and method and linking information to a video (US6570587)
- Linking information to and accessing information from a video (EP0922259,WO1998004984)
- System and method for guided media sequences (WO0203247; application)
- Streaming hypervideo and dynamic hypervideo (WO9910822, EP1005680)