

Name: Alter, Orly | **Citizenship:** Israel and U.S.
Title: USTAR Associate Professor of Bioengineering and Human Genetics, Scientific Computing and Imaging Institute and Huntsman Cancer Institute, University of Utah; <https://alterlab.org/orly/biography.html>

Education/Training

Institution	Degree (if applicable)	Completion Date	Field of Study
Stanford University, CA, USA	postdoctoral fellowship	1/2004	Genetics
Stanford University, CA, USA	Ph.D.	1/1999	Applied Physics
Tel Aviv University, Israel	B.Sc. <i>magna cum laude</i>	10/1989	Physics

Recent Research Experience

2016– Chief Technology Officer (CTO) and Co-Founder, Eigengene, Inc.
2016– Investigator, and Member of the Cancer Control and Population Sciences Program, Huntsman Cancer Institute (HCI), University of Utah
2010– Utah Science, Technology, and Research (USTAR) Associate Professor, Scientific Computing and Imaging (SCI) Institute and Departments of Bioengineering and Human Genetics, University of Utah

Awards

2009–2015 Faculty Early Career Development (CAREER) Award, Division of Mathematical Sciences (DMS), NSF; https://www.nsf.gov/awardsearch/showAward?AWD_ID=0847173
2005 Linear Algebra and its Applications (LAA) Lecture of the International Linear Algebra Society (ILAS); <https://www.ilasic.org/IMAGE/IMAGES/image35.pdf>
2000–2005 Individual Mentored Research Scientist Development Award in Genomic Research and Analysis, National Human Genome Research Institute (NHGRI), NIH
1999–2003 Sloan Foundation/DOE Postdoctoral Fellowship in Computational Molecular Biology
1998 American Physical Society (APS) Outstanding Doctoral Thesis Research in Atomic, Molecular, or Optical Physics (DAMOP) Award Finalist

Military Service

1983–1985 Base Defense Officer, Israeli Air Force; honorably discharged with the rank of First Lieutenant
1982–1983 Operations Researcher, Israeli Air Force Headquarters

Selected Professional Activities

9/2020 Invited Co-Organizer and Speaker, Virtual Symposium, *Decade of the Physical Sciences in Oncology Network (PS-ON) at the National Cancer Institute (NCI)*
6/2020 Invited Co-Chair, Co-Organizer, and Speaker, Session, “Artificial Intelligence and Machine Learning from Research to the Cancer Clinic,” 2020 American Association for Cancer Research (AACR) Virtual Annual Meeting II; <https://www.abstractsonline.com/pp8/#!/9045/session/250> and <https://youtu.be/rXEbMnL8iGc>
1/2020 Invited Speaker, International Webinar, Amazon Web Services (AWS) Education Research Webinar; <https://youtu.be/s4ezu0OHKAs>
1/2020 Invited Speaker, Stanford University Institute for Computational and Mathematical Engineering Seminar (Stanford, CA); <https://youtu.be/opiYfUKDJ2U>
1/2019–1/2020 Selected Co-Chair, Steering Committee, PS-ON, NCI, NIH
7/2018 Keynote Speaker, 14th International Conference on Latent Variable Analysis and Signal Separation (LVA ICA) (Guildford, United Kingdom); <http://cvssp.org/events/lva-ica-2018//keynotes/#orly>
5/2018 Keynote Speaker and Invited Minisymposium Co-Organizer, 2018 Society for Industrial and Applied Mathematics (SIAM) Conference on Applied Linear Algebra (Hong Kong, China); <http://www.math.hkbu.edu.hk/siam-ala18/Invited.html>
2/2009 Invited Participant, Workshop, “Future Directions in Tensor-Based Computation and Modeling,” NSF
1/2008 Invited Participant, Planning Meeting, “The Cancer Genome Atlas (TCGA) Data Portal,” National Human Genome Research Institute (NHGRI), NIH
4/2005– Appointed Member, Scientific Review Panels, DOE, e.g., “Genomes to Life”
2/2005– Invited International Reviewer, e.g., Research Foundation Flanders (FWO), Belgium
12/2001 Invited Participant, Planning Meeting, “A Vision for the Future of Genomics Research,” NHGRI, NIH; <https://genome.gov/11006874/vision-acknowledgements>

Publications at Google Scholar: <https://scholar.google.com/citations?user=RKh11ecAAAAJ>

Selected Patents

1. **O. Alter**, “Genetic Alterations in Glioma,” *United States Patent US 10202643 B2* (Issued February 2019); <https://patents.google.com/patent/US10202643B2>

Selected Books

2. **O. Alter** and Y. Yamamoto, *Quantum Measurement of a Single System*. New York, NY: Wiley-Interscience (2001), 136 pp.; <https://doi.org/10.1002/9783527617128>

Selected Invited Commentaries

3. **O. Alter**, “Discovery of Principles of Nature from Mathematical Modeling of DNA Microarray Data,” *Proc Natl Acad Sci (PNAS) USA* **103**, 16063 (2006); <https://doi.org/10.1073/pnas.0607650103>

Selected Journal Papers

4. S. P. Ponnappalli, M. W. Bradley, K. Devine, J. Bowen, S. E. Coppens, K. M. Leraas, B. A. Milash, F. Li, H. Luo, S. Qiu, K. Wu, H. Yang, C. T. Wittwer, C. A. Palmer, R. L. Jensen, J. M. Gastier-Foster, H. A. Hanson, J. S. Barnholtz-Sloan and **O. Alter**, “Retrospective Clinical Trial Experimentally Validates Glioblastoma Genome-Wide Pattern of DNA Copy-Number Alterations Predictor of Survival,” *Appl Phys Lett (APL) Bioeng* **4**, article 026106 (2020); <https://doi.org/10.1063/1.5142559>
Press Release: J. Kiefer, “Genome-Wide Pattern Found in Tumors from Brain Cancer Patients Predicts Life Expectancy,” *American Association for the Advancement of Science (AAAS) EurekAlert!* (2020); https://www.eurekalert.org/pub_releases/2020-05/uouh-gpf051320.php
5. K. A. Aiello, S. P. Ponnappalli and **O. Alter**, “Mathematically Universal and Biologically Consistent Astrocytoma Genotype Encodes for Transformation and Predicts Survival Phenotype,” *APL Bioeng* **2**, invited article 031909 (2018); <https://doi.org/10.1063/1.5037882>
Feature: A. J. Engler and D. E. Discher, “Rationally Engineered Advances in Cancer Research,” *APL Bioeng* **2**, preface 031601 (2018); <https://aip-info.org/1XPS-5VDRA-50C9RKAB1F/cr.aspx>
6. P. Sankaranarayanan,* T. E. Schomay,* K. A. Aiello and **O. Alter**, “Tensor GSVD of Patient- and Platform-Matched Tumor and Normal DNA Copy-Number Profiles Uncovers Chromosome Arm-Wide Patterns of Tumor-Exclusive Platform-Consistent Alterations Encoding for Cell Transformation and Predicting Ovarian Cancer Survival,” *Public Library of Science (PLoS) One* **10**, article e0121396 (2015); <https://doi.org/10.1371/journal.pone.0121396>
Feature: R. Atkins, “Calculating Cancer Cures,” *National Academy of Engineering (NAE) Innovation Podcast and Radio Series* (2015); <https://nae.edu/Projects/20730/wtop/134897.aspx>
7. S. P. Ponnappalli, M. A. Saunders, C. F. Van Loan and **O. Alter**, “A Higher-Order Generalized Singular Value Decomposition for Comparison of Global mRNA Expression from Multiple Organisms,” *PLoS One* **6**, article e28072 (2011); <https://doi.org/10.1371/journal.pone.0028072>
Mention: Among the top 10% most cited *PLoS One* articles.
8. L. Omberg, J. R. Meyerson, K. Kobayashi, L. S. Drury, J. F. X. Diffley and **O. Alter**, “Global Effects of DNA Replication and DNA Replication Origin Activity on Eukaryotic Gene Expression,” *Mol Syst Biol* **5**, article 312 (2009); <https://doi.org/10.1038/msb.2009.70>
Review: M. Méchali, *Faculty of 1000* evaluation 1728974 (2010); <https://f1000.com/prime/1728974>
9. L. Omberg, G. H. Golub and **O. Alter**, “A Tensor Higher-Order Singular Value Decomposition for Integrative Analysis of DNA Microarray Data from Different Studies,” *PNAS USA* **104**, 18371 (2007); <https://doi.org/10.1073/pnas.0709146104>
10. **O. Alter**, P. O. Brown and D. Botstein, “Generalized Singular Value Decomposition for Comparative Analysis of Genome-Scale Expression Datasets of Two Different Organisms,” *PNAS USA* **100**, 3351 (2003); <https://doi.org/10.1073/pnas.0530258100>
Feature: M. E. Kilmer and C. D. Moravitz Martin, “Decomposing a Tensor,” *SIAM News* **37**, (2004); https://alterlab.org/in_the_news/Kilmer_Moravitz-Martin_SIAM_News_2004_Feature.pdf

Recent Research Support

	Grant	PI	Sponsor	Period	Total	Share
1.	U01 CA-202144	O. Alter	NIH/NCI	9/23/2015–9/22/2021	\$3,395,986	\$3,395,986

NCI PS-ON U01: Multi-Tensor Decompositions for Personalized Cancer Diagnostics and Prognostics, with co-investigators H. A. Hanson, R. L. Jensen, C. A. Palmer, and C. T. Wittwer, and consultant R. A. Horn (University of Utah), and subcontractors J. S. Barnholtz-Sloan (Case Western Reserve University), J. M. Gastier-Foster, (Nationwide Children’s Hospital), M. Hayden Gephart and C. B. Patel (Stanford University), E. Lyon (HudsonAlpha Institute for Biotechnology), and H. Yang (Beijing Genomics Institute); <https://physics.cancer.gov/network/UniversityofUtah.aspx>