CURRICULUM VITAE

Shahar Alon

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Personal Born July 1979, Israeli Citizenship

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Education

2014-2019 Postdoctoral Fellow, Synthetic Neurobiology Group
Advisor: Prof. Ed Boyden. McGovern Institute for Brain Research, Massachusetts Institute of Technology (MIT)

2016-2019 Howard Hughes Medical Institute Fellow of the Life Sciences Research Foundation

2009-2014 Ph.D. in Neuroscience,
The Interdisciplinary Doctoral Program in Neuroscience for Outstanding Students at Tel Aviv University.
Faculty of Life Sciences and School of Physics, Tel Aviv University.
Title: 'Revealing new functional roles of RNA editing in the brain'
Advisors: Prof. Eli Eisenberg, School of Physics and Astronomy
Prof. Yoav Gothilf, Department of Neurobiology

2006-2008 M.Sc. in Neurobiology, *Summa cum laude*,
Faculty of Life Sciences and School of Physics, Tel Aviv University.
Title: 'Genome-wide analysis of spatial and temporal expression in the context of the circadian clock'
Advisors: Prof. Eli Eisenberg, School of Physics and Astronomy
Prof. Yoav Gothilf, Department of Neurobiology

1997-2000 B.Sc. The Department of Physics, Bar-Ilan University

Additional Scientific Experience

2012 Visitor Scientist, Harvard Medical School, Department of Genetics, George Church lab (November 2012-January 2013)

2000-2005 Computational Physicist, Nuclear Research Center - Negev, Department of Physics

Notable Academic Awards

2016-2019 Life Science Research Foundation Fellowship (*~25 Ph.D. from all the Life Sciences fields receive this scholarship in U.S. each year from more than 1000 applicants*)

2014-2016 Rothschild Postdoctoral Fellowship (*12 Ph.D. from all STEM fields receive this scholarship in Israel each year*)

2011-2014 Clore Foundation Fellowship for Outstanding Scholars (*10 Ph.D. students from all STEM fields receive this scholarship in Israel each year*)

Other Academic Awards

2014 Best Poster Award, First Sagol School of Neuroscience Retreat, Tel Aviv University

2013 Adams Super Center Student Travel Grant, Tel Aviv University

2013 Best Publication Award, the Sagol School of Neuroscience, Tel Aviv University

2012 Award for Excellence in Research, The George S. Wise Faculty of Life Sciences, Tel Aviv University

2012 Best Poster Award, Seventh Edmond J. Safra Center for Bioinformatics Retreat, Tel Aviv University

2011 Best Grant Proposal Award, the Sagol School of Neuroscience, Tel Aviv University

2011 The Constantiner Institute for Molecular Genetics Travel Scholarship, Tel Aviv University

2009-2011 The Dean Scholarship for Excellent Students, Tel Aviv University

2008 Award for 'trainees who have demonstrated exceptional research success and potential through their presentation': Gordon Research Conference on 'Pineal Cell Biology – Mechanisms of Circadian Rhythmicity'

2008 Award for Excellence in Teaching and Research, Tel Aviv University

2008 M.Sc. *Summa cum laude*, Tel Aviv University

1998 Distinction award for B.Sc. students. The Department of Physics, Bar-Ilan University

List of Publications (28 manuscripts, 1458 citations, h-index 20)

2020 **Alon S***, Goodwin DR*, Sinha A*, Wassie AT*, Chen F*, Daugharthy ER, Bando Y, Kajita A, Xue AG, Marrett K, Prior R, Cui Y, Payne AC, Yao C-C, Suk H-J, Wang R, Yu C-C, Tillberg P, Reginato P, Pak N, Liu S, Punthambaker S, Iyer EPR, Kohman RE, Miller JA, Lein ES, Lako A, Cullen N, Rodig S, Helvie K, Abravanel DL, Wagle N, Johnson BE, Klughammer J, Slyper M, Waldman J, Jané-Valbuena J, Rosen RO, Regev A, IMAXT Consortium, Church GM, Marblestone AH, Boyden ES. Expansion Sequencing: Spatially Precise In Situ Transcriptomics in Intact Biological Systems. Biorxiv. *Equal contribution.

2018 **Alon S***, Huynh GH*, Boyden ES. Expansion Microscopy: Enabling Single Cell Analysis In Intact Biological Systems. Review Article. **FEBS Journal**. *Equal contribution. Impact factor: 4.5.

2017 Liscovitch-Brauer N, **Alon S**, Porath HT, Elstein B, Unger R, Ziv T, Admon A, Levanon EY, Rosenthal JJC, Eisenberg E. Trade-off between Transcriptome Plasticity and Genome Evolution in Cephalopods. **Cell**, 169:191–202. Covered by: Cell Journal Cover, Nature, Nature Reviews Genetics, New York Times, Washington Post, Daily Mail, Scientific American, WIRED, The Atlantic and more. Impact factor: 30.4.

2017 Porath HT, Schaffer A, Kaniewska P, **Alon S**, Eisenberg E, Rosenthal J, Levanon EY, Levy O. A-to-I RNA editing in the earliest-diverging eumetazoan phyla. **Molecular Biology and Evolution**, msx125. Impact factor: 6.2.

2017 Cesarini V, Silvestris DA, Tassinari V, Tomaselli S, **Alon S**, Eisenberg E, Locatelli F, Gallo A. ADAR2/miR-589-3p axis controls glioblastoma cell migration/invasion. **Nucleic Acids Research**; doi: 10.1093/nar/gkx1257. Impact factor: 10.2.

2016 Rainy N, Etzion T, **Alon S**, Pomeranz A, Nisgav Y, Livnat T, Bach M, Gerstner CD, Baehr W, Gothilf Y, Stiebel-Kalish H. Unc119c knockdown results in visual impairment and early-onset retinal dystrophy in zebrafish. **Biochemical and Biophysical Research Communications**. 473:1211-1217. Impact factor: 2.3.

2016 Chen F, Wassie AT, Cote AJ, Sinha A, **Alon S**, Asano S, Daugharthy ER, Chang JB, Marblestone A, Church GM, Raj A, Boyden ES. Nanoscale Imaging of RNA with Expansion Microscopy. **Nature Methods**, 13:679-684. Impact factor: 25.1.

2016 Ben-Moshe Z, **Alon S**, Vallone D, Bayleyen Y, Tovin A, Shainer I, Nisembaum LG, Aviram I, Smadja SS, Fuentes M, Falcón J, Eisenberg E, Klein DC, Burgess HA, Foulkes NS, Gothilf Y. Genetically Blocking the Zebrafish Pineal Clock Affects Circadian Behavior. **PLOS Genetics**, 12(11): e1006445. Impact factor: 6.1.

2015 **Alon S**, Garrett SC, Levanon EY, Olson S, Graveley BR, Rosenthal JJC, Eisenberg E. The majority of transcripts in the squid nervous system are extensively recoded by A-to-I RNA editing. **eLife**, 4, e05198. Covered by: Science Magazine Editor's Choice, NHGRI, NSF, Phys.org and more. Impact factor: 7.7.

2015 Tomaselli S, Galeano F, **Alon S**, Raho S, Galardi S, Polito VA, Presutti C, Vincenti S, Eisenberg E, Locatelli F, Gallo A. Modulation of microRNA editing, expression and processing through ADAR2 deaminase in glioblastoma. **Genome Biology**, 16:5. Impact factor: 11.9.

2015 **Alon S**, Erew M, Eisenberg E. DREAM: a webserver for the identification of editing sites in mature miRNAs using deep sequencing data. **Bioinformatics**, 31:2568-2570. Impact factor: 7.3.

2015 Oren M*, Tarrant AM*, **Alon S**, Simon-Blecher N, Elbaz I, Appelbaum L, Levy O. Profiling molecular and behavioral circadian rhythms in the non-symbiotic sea anemone Nematostella vectensis. **Scientific Reports**, 5:11418. *Equal contribution. Impact factor: 4.2.

2015 Bekerman LY, Elbaz I, Diber A, Dahary D, Bar LG, **Alon S**, Goldshtein TL, Appelbaum L. Hypocretin neuron-specific transcriptome profiling identifies the sleep modulator Kcnh4a. **eLife**, 10.7554/eLife.08638. Impact factor: 7.7.

2015 Kaniewska P*, **Alon S***, Karako-Lampert S, Hoegh-Guldberg O, Levy O. Signaling cascades and the importance of moonlight in coral broadcast mass spawning. **eLife**, 10.7554/eLife.09991. Covered by eLife Insight: 'Sex under the moon'. *Equal contribution. Impact factor: 7.7.

2014 Ben-Moshe Z*, **Alon S***, Mracek P, Faigenbloom L, Tovin A, Vatine G, Eisenberg E, Foulkes SN, Gothilf Y (2014). The light-induced transcriptome of the zebrafish pineal gland reveals complex regulation of the circadian clockwork by light. **Nucleic Acids Research**, doi: 10.1093/nar/gkt1359. *Equal contribution. Impact factor: 10.2.

2012 **Alon S***, Mor E*, Vigneault F*, Gallo A, Locatelli F, Church GM, Shomron N, Eisenberg E. Systematic identification of edited microRNAs in the human brain. **Genome Research**, 22:1533-1540 . *Equal contribution. Impact factor: 11.3.

2012 Dresner E, Zemel A, Arviv C, Barak SL, **Alon S**, Ofir R, Gothilf Y, Gozes I. Novel Evolutionary-Conserved Role for the ADNP Protein Family that is Important for Erythropoiesis. **J Biol Chem**. 287(48):40173-40185. Impact factor: 4.2.

2012 Tovin A*, **Alon S***, Ben-Moshe Z, Mracek P, Vatine G, Foulkes N, Jacob-Hirsch J, Rechavi G, Coon SL, Klein DC, Eisenberg E, Gothilf Y. Systematic identification of rhythmic genes reveals camk1gb as a new element in the circadian clockwork. **PLOS Genetics**, 8(12):e1003116. *Equal contribution. Impact factor: 6.1.

2012 Sela-Culang I, **Alon S**, Ofran Y. A Systematic Comparison of Free and Bound Antibodies Reveals Binding-Related Conformational Changes. **J Immunol**. 189:4890-4899. Appear in the 'Issue Highlights' section. Impact factor: 4.9.

2012 Smadja-Storz S, Tovin A, Mracek P, **Alon S**, Foulkes NS, Gothilf Y. Casein kinase 1delta activity: a key element in the zebrafish circadian timing system. **PLOS One**, 8(1):e54189. Impact factor: 2.8.

2011 Levy O*, Kaniewska P*, **Alon S**, Eisenberg E, Karako-Lampert S, Bay LK, Reef R, Rodriguez-Lanetty M, Miller DJ, Hoegh-Guldberg O. Complex diel cycles of gene expression in the coral-algal symbiosis. **Science**, 331:175. *Equal contribution. Impact factor: 37.2.

2011 **Alon S***, Vigneault F*, Eminaga S, Christodoulou D, Seidman J, Church GM, Eisenberg E. Bar-coding bias in high-throughput multiplex sequencing of miRNA. **Genome Research**, 21:1506–1511. *Equal contribution. Impact factor: 11.3.

2010 Ben-Moshe Z, Vatine G, **Alon S**, Tovin A, Mracek P, Foulkes N, Gothilf Y. Multiple PAR and E4BP4 bZIP transcription factors in zebrafish: diverse spatial and temporal expression patterns. **Chronobiology Int**. 27(8):1509-31. Impact factor: 3.3.

2009 **Alon S**, Eisenberg E, Jacob-Hirsch J, Rechavi G, Vatine G, Toyama R, Coon SL, Klein DC, Gothilf Y. A new cis-acting regulatory element driving gene expression in the zebrafish pineal gland. **Bioinformatics**, 25(5):559-62. Impact factor: 7.3.

2009 Toyama R, Chen X, Jhawar N, Aamar E, Epstein J, Reany N, **Alon S**, Gothilf Y, Klein DC, Dawid IB. Transcriptome analysis of the zebrafish pineal gland. **Dev Dyn**, 238(7):1813-1826. Impact factor: 2.1.

Peer Reviewed Book Chapters

2015 **Alon S**, Eisenberg E. Using deep sequencing data for identification of editing sites in mature miRNAs. **Methods in Molecular Biology** 1269:231-42.

2013 **Alon S**, Eisenberg E. Identifying RNA editing sites in miRNAs by deep sequencing. **Methods in Molecular Biology**, 1038:159-170.

2012 Vigneault F*, Ter-Ovanesyan D*, **Alon S***, Eminaga S, Christodoulou D, Seidman J, Eisenberg E, Church GM. High-throughput multiplex sequencing of miRNA. **Current Protocols in Human Genetics**, 11.12:1-10. *Equal contribution.

Granted Patents

2020 **Alon S**, Chen F, Payne A, Wassie A, Goodwin D, Boyden ES. Augmenting *In Situ* Nucleic Acid Sequencing of Expanded Biological Samples with *In Vitro* Sequence Information. US Patent No. 10526649.

2019 Wassie A, Chen F, Boyden ES, **Alon S**. Nanoscale Imaging of Proteins and Nucleic Acids via Expansion Microscopy. US Patent No. 10364457.

2018 **Alon S**, Boyden ES, Chen F, Church GM, Daugharthy E, Marblestone A, Tillberg PW. *In situ* nucleic acid sequencing of expanded biological samples. US patent No. 10059990.

Patent Applications

2018 Chen F, Wassie A, **Alon S**, Marblestone AH, Sinha A, Payne A, Boyden ES. Multiplexed Signal Amplified FISH via Splinted Ligation Amplification and Sequencing. US Patent App. 15/876,347.

2017 Wassie A, Chen F, Boyden ES, **Alon S**. Nanoscale Imaging of Proteins and Nucleic Acids via Expansion Microscopy. US Patent App. 15/229,539.

Oral Presentations

2020 'In situ sequencing reveals the spatial-molecular organization of neural circuits', The Gonda Brain Center Annual Meeting, Bar Ilan University, Israel, March 3, Invited Speaker.

2020 'Nanoscale in situ sequencing of tissues from patients', Israel Society for Medical and Biological Engineering (ISMBE), Haifa, Israel, February 25, Invited Speaker.

2020 'The next genomic revolution? the promise and challenges of spatial genomics', Transcriptome workshop, Haifa University, Israel, February 12, Invited Speaker.

2020 'In situ sequencing reveals the spatial-molecular organization of neural circuits', Israel Society for Neuroscience (ISfN), Eilat, Israel, January 6, Invited Speaker.

2017 'Comprehensive in Situ Transcriptome Characterization Throughout Intact Brain Circuits', NHGRI/NIH Centers of Excellence in Genomic Science, Seattle, WA, October 3. Invited Speaker.

2016 'Expansion Sequencing (ExSEQ): Comprehensive In Situ Transcriptome Characterization Throughout Intact Brain Circuits', Pittcon Conference, Atlanta, Georgia, March 10. Invited Speaker.

2016 'Expansion Microscopy & Expansion Sequencing', Focus on Microscopy Conference (FOM), Taipei, Taiwan, March 20. Invited Speaker. Plenary Session.

2015 'ExSEQ: Expansion microscopy in-situ sequencing', Physics of Brain Activity Mapping III (PoBAM III), Massachusetts Institute of Technology, February 25. Invited Speaker.

2015 'Expansion Sequencing (ExSEQ): Towards Comprehensive In Situ Transcriptome Characterization Throughout Intact Brain Circuits', McGovern Institute Retreat, Falmouth, Massachusetts, May 31. Invited Speaker.

2014 'Genome-wide measurements of the circadian clock', Two lectures given in a course at the Interuniversity Institute for Marine Sciences

	‘Periodicity & Rhytmicity in Marine Ecosystems’, Eilat – Israel, January 12-16.
2014	'New functional roles of RNA editing in the brain', Bar-Ilan University – Israel, January 20.
2014	'Glass half full: on true understanding of the human brain, Barack Obama, and beer', Lecture giving to the general audience as part of the Wize project, Beer Garden, Tel Aviv – Israel, January 29.
2014	'Edited microRNA regulates daily locomotor rhythms in zebrafish', FISEB/ILANIT Congress, Eilat – Israel, February 10-13.
2012-2013	'High-Throughput methods in circadian biology', Lecture given in a course at the Bar-Ilan University 'Biological Clocks', Bar-Ilan University – Israel, May 13, 2012 and May 19, 2013.
2012	‘Genome-wide measurements of the circadian clock’, Lecture given in a course at the Interuniversity Institute for Marine Sciences ‘Periodicity & Rhytmicity in Marine Ecosystems’, Eilat – Israel, January 8-13.
2012	'Editing of microRNAs in the human brain', SINS Congress 2012, Catania - Italy, April 19-22. Invited Speaker.
2011	'Systematic identification of A-to-I editing in miRNAs', Gordon Research Conference on 'RNA editing', Galveston, TX - USA, January 8-14.
2011	'Multiplexing in miRNA deep-sequencing: doing it wrong, doing it right', the 3rd Annual TAU microRNA Consortium Conference, Tel Aviv University – Israel, January 27.
2011	'Measuring the circadian clock', Lecture given in a course at the Bar-Ilan University 'Biological Clocks', Bar-Ilan University - Israel, May 1.
2011	'Diving Deep into miRNAs: Identifying Editing Sites and Removing Deep-Sequencing Biases', Sixth Edmond J. Safra Bioinformatics Retreat, Hagoshrim – Israel, May 18-19.
2011	'Next Generation Sequencing of the Nematostella', Conference on Nematostella as a model organism, Shadot Yam - Israel, December 4.
2011	'Systematic identification of edited miRNAs in the brain', the 4rd Annual TAU microRNA Consortium Conference, Tel Aviv University – Israel, December 18.
2010	‘High-throughput multiplex sequencing of miRNA: bias and solution’, Conference of the Institute of Biotechnology, Maalot – Israel, June 22-24.
2010	‘Using genome-wide tools for the analysis of the circadian clock’, Lecture given in a course at the Interuniversity Institute for Marine Sciences ‘Periodicity & Rhytmicity in Marine Ecosystems’, Eilat – Israel, October 17-26.
2008	'*In-silico* identification and *in-vivo* validation of a new regulatory element governing pineal-specific expression', Gordon Research Conference on 'Pineal Cell Biology – Mechanisms of Circadian Rhythmicity', Il Ciocco – Italy, April 20-25.

Teaching Experience and Additional Academic Activities

2020	Lecturer in the course ‘Advanced Bio-Engineering Lab’ and ‘Biological Data Science’, Bar-Ilan University
2016	Teaching Certificate from MIT Kaufman Teaching Certificate Program
2009-2018	Writing referee reports for *Bioinformatics* and *Nucleic Acids Research*

2013-2014	Lecturer in the course 'Matlab Programming for Neuroscience' *(over 100 registered students)*, Tel Aviv University.
2010-2012	Teaching assistant (TA) in the course 'Lab in Molecular Biology', Tel Aviv University.
2008-2009	TA in the course 'Bioinformatics', Bar-Ilan University.
2008-2009	TA in the course 'Biochemistry', Bar-Ilan University.
2007	TA in the course 'Lab in Molecular Biology', Tel Aviv University.