

## ELSC Member's Publications: July - December 2021

### Adi Mizrahi

1. Cohen-Kashi Malina K, Tsivourakis E, Kushinsky D, Apelblat D, Shtiglitz S, Zohar E, Sokoletsky M, Tasaka GI, **Mizrahi A**, Lampl I, Spiegel I. NDNF interneurons in layer 1 gain-modulate whole cortical columns according to an animal's behavioral state. *Neuron*. 2021 Jul 7;109(13):2150-2164.e5. doi: 10.1016/j.neuron.2021.05.001. Epub 2021 May 25. PMID: 34038743.
2. Feigin L, Tasaka G, Maor I, **Mizrahi A**. Sparse Coding in Temporal Association Cortex Improves Complex Sound Discriminability. *J Neurosci*. 2021 Aug 18;41(33):7048-7064. doi: 10.1523/JNEUROSCI.3167-20.2021. Epub 2021 Jul 8. PMID: 34244361; PMCID: PMC8372025.
3. Yatziv SL, Yudco O, Vaso K, **Mizrahi A**, Devor M. Anesthesia in mice activates discrete populations of neurons throughout the brain. *J Neurosci Res*. 2021 Dec;99(12):3284-3305. doi: 10.1002/jnr.24950. Epub 2021 Sep 12. PMID: 34510528.

### Aviv Mezer

4. Huber E, **Mezer A**, Yeatman JD. Neurobiological underpinnings of rapid white matter plasticity during intensive reading instruction. *Neuroimage*. 2021 Nov;243:118453. doi: 10.1016/j.neuroimage.2021.118453. Epub 2021 Aug 4. PMID: 34358657.
5. Natu VS, Rosenke M, Wu H, Querdas FR, Kular H, Lopez-Alvarez N, Grotheer M, Berman S, **Mezer AA**, Grill-Spector K. Infants' cortex undergoes microstructural growth coupled with myelination during development. *Commun Biol*. 2021 Oct 14;4(1):1191. doi: 10.1038/s42003-021-02706-w. PMID: 34650227; PMCID: PMC8516989.
6. Schurr R, **Mezer AA**. The glial framework reveals white matter fiber architecture in human and primate brains. *Science*. 2021 Nov 5;374(6568):762-767. doi: 10.1126/science.abj7960. Epub 2021 Oct 7. PMID: 34618596.

### Baruch Minke

7. Berg J, Sorensen SA, Ting JT, Miller JA, Chartrand T, Buchin A, Bakken TE, Budzillo A, Dee N, Ding SL, Gouwens NW, Hodge RD, Kalmbach B, Lee C, Lee BR, Alfiler L, Baker K, Barkan E, Beller A, Berry K, Bertagnolli D, Bickley K, Bomben J, Braun T, Brouner K, Casper T, Chong P, Crichton K, Dalley R, de Frates R, Desta T, Lee SD, D'Orazi F, Dotson N, Egdorf T, Enstrom R, Farrell C, Feng D, Fong O, Furdan S, Galakhova AA, Gamlin C, Gary A, Glandon A, Goldy J, Gorham M, Goriounova NA, Gratiy S, Graybuck L, Gu H, Hadley K, Hansen N, Heistek TS, Henry AM, Heyer DB, Hill D, Hill C, Hupp M, Jarsky T, Kebede S, Keene L, Kim L, Kim MH, Kroll M, Latimer C, Levi BP, Link KE, Mallory M, Mann R, Marshall D, Maxwell M, McGraw M, McMillen D, Melief E, Mertens EJ, Mezei L, Mihut N, Mok S, Molnar G, Mukora A, Ng L, Ngo K, Nicovich PR, Nyhus J, Olah G, Oldre A, Omstead V, Ozsvar A, Park D, Peng H, Pham T, Pom CA, Potekhina L, Rajanbabu R, Ransford S, Reid D, Rimorin C, Ruiz A, Sandman D, Sulc J, Sunkin SM, Szafer A, Szemenyei V, Thomsen ER, Tieu M, Torkelson A, Trinh J, Tung H, Wakeman W, Waleboer F, Ward K, Wilbers R, Williams G, Yao Z, Yoon JG, Anastassiou C, Arkhipov A, Barzo P, Bernard A, Cobbs C, de Witt Hamer PC, Ellenbogen RG, Esposito L, Ferreira M, Gwinn RP, Hawrylycz MJ, Hof PR, Idema S, Jones AR, Keene CD, Ko AL, Murphy Brandwine T, Ifrah R, Bialistoky T, Zaguri R, Rhodes-Mordov E, Mizrahi-Meissonnier L, Sharon D, Katanaev VL, Gerlitz O, **Minke B**. Knockdown of

Dehydrodolichyl Diphosphate Synthase in the Drosophila Retina Leads to a Unique Pattern of Retinal Degeneration. *Front Mol Neurosci.* 2021 Jul 5;14:693967. doi: 10.3389/fnmol.2021.693967. PMID: 34290587; PMCID: PMC8287061.

#### Chaya Kalcheim

8. Kahane N, **Kalcheim C.** From Bipotent Neuromesodermal Progenitors to Neural-Mesodermal Interactions during Embryonic Development. *Int J Mol Sci.* 2021 Aug 24;22(17):9141. doi: 10.3390/ijms22179141. PMID: 34502050; PMCID: PMC8431582.
9. Rekler, D. and **Kalcheim, C.** (2021). From Neural Crest to definitive Roof Plate: the dynamic behavior of the dorsal neural tube. *Int. J. Mol. Sci.* 22(8), 3911; <https://doi.org/10.3390/ijms22083911>.

#### Ehud Zohary

10. Moreh E, **Zohary E**, Orlov T. The presence of semantic content in a visual recognition memory task reduces the severity of neglect. *Neuropsychologia.* 2021 Jul 16;157:107860. doi: 10.1016/j.neuropsychologia.2021.107860. Epub 2021 Apr 24. PMID: 33901565.
11. Orlov T, Raveh M, McKyton A, Ben-Zion I, **Zohary E.** Learning to perceive shape from temporal integration following late emergence from blindness. *Curr Biol.* 2021 Jul 26;31(14):3162-3167.e5. doi: 10.1016/j.cub.2021.04.059. Epub 2021 May 26. PMID: 34043950.
12. Senna I, Andres E, McKyton A, Ben-Zion I, **Zohary E**, Ernst MO. Development of multisensory integration following prolonged early-onset visual deprivation. *Curr Biol.* 2021 Nov 8;31(21):4879-4885.e6. doi: 10.1016/j.cub.2021.08.060. Epub 2021 Sep 16. PMID: 34534443.

#### Eran Meshorer

13. Bar S, Vershkov D, Keshet G, Lezmi E, Meller N, Yilmaz A, Yanuka O, Nissim-Rafinia M, **Meshorer E**, Eldar-Geva T, Benvenisty N. Identifying regulators of parental imprinting by CRISPR/Cas9 screening in haploid human embryonic stem cells. *Nat Commun.* 2021 Nov 18;12(1):6718. doi: 10.1038/s41467-021-26949-7. PMID: 34795250; PMCID: PMC8602306.
14. Leader Y, Lev Maor G, Sorek M, Shayevitch R, Hussein M, Hameiri O, Tammer L, Zonszain J, Keydar I, Hollander D, **Meshorer E**, Ast G. The upstream 5' splice site remains associated to the transcription machinery during intron synthesis. *Nat Commun.* 2021 Jul 27;12(1):4545. doi: 10.1038/s41467-021-24774-6. PMID: 34315864; PMCID: PMC8316553.

#### Hagai Bergman

15. Guang J, Baker H, Ben-Yishay Nizri O, Firman S, Werner-Reiss U, Kapuller V, Israel Z, **Bergman H.** Toward asleep DBS: cortico-basal ganglia spectral and coherence activity during interleaved propofol/ketamine sedation mimics NREM/REM sleep activity. *NPJ Parkinsons Dis.* 2021 Aug 2;7(1):67. doi: 10.1038/s41531-021-00211-9. PMID: 34341348; PMCID: PMC8329235.
16. Iskhakova, L. P. Rappel, G. Fonar , O. Marmor, R. Paz , Z. Israel , R. Eitan, **H. Bergman** Frequency matters: Up- and Down-Regulation of Dopamine Tone Induces Similar Frequency Shifts in Cortico-Basal Ganglia Beta Oscillations. *bioRxiv preprint*

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17. Sand D, Arkadir D, Abu Snineh M, Marmor O, Israel Z, **Bergman H**, Hassin-Baer S, Israeli-Korn S, Peremen Z, Geva AB, Eitan R. Deep Brain Stimulation Can Differentiate Subregions of the Human Subthalamic Nucleus Area by EEG Biomarkers. *Front Syst Neurosci.* 2021 Oct 20;15:747681. doi: 10.3389/fnsys.2021.747681. PMID: 34744647; PMCID: PMC8565520.
  18. Liu X, Xu Y, **Bergman H**, Li S, Wang W. A systematic review of Twiddler's syndrome: a hardware-related complication of deep brain stimulation. *Neurosurg Rev.* 2021 Sep 7. doi: 10.1007/s10143-021-01636-9. Epub ahead of print. PMID: 34491478.

#### Haim Sompolinsky

19. Ginosar G, Aljadeff J, **Burak Y, Sompolinsky H**, Las L, Ulanovsky N. Locally ordered representation of 3D space in the entorhinal cortex. *Nature.* 2021 Aug;596(7872):404-409. doi: 10.1038/s41586-021-03783-x. Epub 2021 Aug 11. PMID: 34381211.
20. Li Q, **Sompolinsky H**. Statistical mechanics of deep linear neural networks: The backpropagating kernel renormalization. *Physical Review X.* 2021 Sep 16;11(3):031059.
21. Naveh G, David OB, **Sompolinsky H**, Ringel Z. Predicting the outputs of finite deep neural networks trained with noisy gradients. *Physical Review E.* 2021 Dec 2;104(6):064301.

#### Hermona Soreq

22. Anglister L, Silman I, **Soreq H**. Preface: Cholinergic mechanisms: This is the Preface for the special issue "Cholinergic Mechanisms". *J Neurochem.* 2021 Sep;158(6):1212-1216. doi: 10.1111/jnc.15480. Epub 2021 Aug 29. PMID: 34458988.
23. Eikelis N, Dixon JB, Lambert EA, Hanin G, Tzur Y, Greenberg DS, **Soreq H**, Marques FZ, Fahey MT, Head GA, Schlaich MP, Lambert GW. MicroRNA-132 may be associated with blood pressure and liver steatosis-preliminary observations in obese individuals. *J Hum Hypertens.* 2021 Aug 27. doi: 10.1038/s41371-021-00597-2. Epub ahead of print. PMID: 34453104.
24. Winek K, **Soreq H**, Meisel A. Regulators of cholinergic signaling in disorders of the central nervous system. *J Neurochem.* 2021 Sep;158(6):1425-1438. doi: 10.1111/jnc.15332. Epub 2021 Mar 19. PMID: 33638173

#### Idan Segev

25. Beniaguev D, **Segev I, London M**. Single cortical neurons as deep artificial neural networks. *Neuron.* 2021 Sep 1;109(17):2727-2739.e3. doi: 10.1016/j.neuron.2021.07.002. Epub 2021 Aug 10. PMID: 34380016.
26. GJ, Ng L, Ojemann JG, Patel AP, Phillips JW, Silbergeld DL, Smith K, Tasic B, Yuste R, **Segev I**, de Kock CPJ, Mansvelder HD, Tamas G, Zeng H, Koch C, Lein ES. Human neocortical expansion involves glutamatergic neuron diversification. *Nature.* 2021 Oct;598(7879):151-158. doi: 10.1038/s41586-021-03813-8. Epub 2021 Oct 6. Erratum in: *Nature.* 2022 Jan 6;: PMID: 34616067; PMCID: PMC8494638.
27. Dudai A, Doron M, **Segev I, London M**. Synaptic input and ACh modulation regulate dendritic Ca<sup>2+</sup> spike duration in pyramidal neurons, directly affecting their somatic output. *J Neurosci.* 2021 Dec 10;JN-RM-1470-21. doi: 10.1523/JNEUROSCI.1470-21.2021. Epub ahead of print. PMID: 34893549.

28. Ezra-Tsur E, Amsalem O, Ankri L, Patil P, **Segev I**, Rivlin-Etzion M. Realistic retinal modeling unravels the differential role of excitation and inhibition to starburst amacrine cells in direction selectivity. *PLoS Comput Biol*. 2021 Dec 30;17(12):e1009754. doi: 10.1371/journal.pcbi.1009754. Epub ahead of print. PMID: 34968385.
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30. Leleo EG, **Segev I**. Burst control: Synaptic conditions for burst generation in cortical layer 5 pyramidal neurons. *PLoS Comput Biol*. 2021 Nov 2;17(11):e1009558. doi: 10.1371/journal.pcbi.1009558. PMID: 34727124; PMCID: PMC8589150.

#### Inbal Goshen

31. Refaeli R, Doron A, Benmelech-Chovav A, Groysman M, Kreisel T, **Loewenstein Y**, **Goshen I**. Features of hippocampal astrocytic domains and their spatial relation to excitatory and inhibitory neurons. *Glia*. 2021 Oct;69(10):2378-2390.

#### Israel Nelken

32. Harpaz M, Jankowski MM, Khouri L, **Nelken I**. Emergence of abstract sound representations in the ascending auditory system. *Prog Neurobiol*. 2021 Jul;202:102049. doi: 10.1016/j.pneurobio.2021.102049. Epub 2021 Apr 15. PMID: 33845166.
33. Regev TI, Markusfeld G, **Deouell LY**, **Nelken I**. Context Sensitivity across Multiple Time scales with a Flexible Frequency Bandwidth. *Cereb Cortex*. 2021 Nov 23;32(1):158-175. doi: 10.1093/cercor/bhab200. PMID: 34289019.

#### Leo Joskowicz

34. Avidris N, Yehuda B, Ben-Zvi O, Link-Sourani D, Ben-Sira L, Miller E, Zharkov E, Ben Bashat D, **Joskowicz L**. Automatic linear measurements of the fetal brain on MRI with deep neural networks. *Int J Comput Assist Radiol Surg*. 2021 Sep;16(9):1481-1492. doi: 10.1007/s11548-021-02436-8. Epub 2021 Jun 29. PMID: 34185253.
35. Shamul N, **Joskowicz L**. Change detection in sparse repeat CT scans with non-rigid deformations. *J Xray Sci Technol*. 2021;29(6):987-1007. doi: 10.3233/XST-211040. PMID: 34690154.
36. Szeskin A, Yehuda R, Shmueli O, Levy J, **Joskowicz L**. A column-based deep learning method for the detection and quantification of atrophy associated with AMD in OCT scans. *Med Image Anal*. 2021 Aug;72:102130. doi: 10.1016/j.media.2021.102130. Epub 2021 Jun 12. PMID: 34198041.

#### Leon Deouell

37. Garrido M. I, **Leon Y Deouell** (2021). Unilateral neglect within the predictive processing framework, *Brain Communications*, Volume 3, Issue 3, , fcab193, <https://doi.org/10.1093/braincomms/fcab193>
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#### Merav Ahissar

38. Gertsovski A, **Ahissar M**. Reduced learning of sound categories in dyslexia is associated with reduced regularity-induced auditory cortex adaptation. *J Neurosci*. 2021 Dec 21;JN-RM-1533-21. doi: 10.1523/JNEUROSCI.1533-21.2021. Epub ahead of print. PMID: 34969869.
39. Vishne G, Jacoby N, Malinovitch T, Epstein T, Frenkel O, **Ahissar M**. Slow update of internal representations impedes synchronization in autism. *Nat Commun*. 2021 Sep 14;12(1):5439. doi: 10.1038/s41467-021-25740-y. PMID: 34521851; PMCID: PMC8440645.

#### Mickey London

- Beniaguev D, **Segev I, London M**. Single cortical neurons as deep artificial neural networks. *Neuron*. 2021 Sep 1;109(17):2727-2739.e3. doi: 10.1016/j.neuron.2021.07.002. Epub 2021 Aug 10. PMID: 34380016.
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#### Naomi Habib

40. Cable J, Elowitz MB, Domingos AI, **Habib N**, Itzkovitz S, Hamidzada H, Balzer MS, Yanai I, Liberali P, Whited J, Streets A, Cai L, Stergachis AB, Hong CKY, Keren L, Williams M, Alon U, Shalek AK, Hamel R, Pfau SJ, Raj A, Quake SR, Zhang NR, Fan J, Trapnell C, Wang B, Greenwald NF, Vento-Tormo R, Santos SDM, Spencer SL, Garcia HG, Arekatla G, Gaiti F, Arbel-Goren R, Rulands S, Junker JP, Klein AM, Morris SA, Murray JI, Galloway KE, Ratz M, Romeike M. Single cell biology-a Keystone Symposia report. *Ann N Y Acad Sci*. 2021 Dec;1506(1):74-97. doi: 10.1111/nyas.14692. Epub 2021 Oct 3. PMID: 34605044.
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#### Yair Weiss

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43. Horan, D., Richardson, E., & **Weiss, Y.** (2021). When Is Unsupervised Disentanglement Possible?. *Advances in Neural Information Processing Systems*, 34.

#### Yossi Grodzinsky

44. **Grodzinsky Y**, Pieperhoff P, Thompson C. Stable brain loci for the processing of complex syntax: A review of the current neuroimaging evidence. *Cortex*. 2021

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#### Yonatan Loewenstein

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#### Yoram Burak

- Ginosar G, Aljadeff J, **Burak Y**, **Sompolinsky H**, Las L, Ulanovsky N. Locally ordered representation of 3D space in the entorhinal cortex. Nature. 2021 Aug;596(7872):404-409. doi: 10.1038/s41586-021-03783-x. Epub 2021 Aug 11. PMID: 34381211.