

BIOGRAPHICAL SKETCH

NAME:Eitan Okun, Ph.D.

eRA COMMONS USER NAME: EITANOKUN

POSITION TITLE: Associate Professor, The Mina and Everard Goodman Faculty of Life Sciences, The Gonda Multidisciplinary brain research center, Bar Ilan University, Ramat Gan, Israel

INSTITUTION AND LOCATION	DEGREE	Start Date	Completion Date	FIELD OF STUDY
Bar Ilan University, Ramat-Gan, Israel	B.Sc.	09/2001	10/2003	Biology
Bar Ilan University, Ramat-Gan, Israel	M.Sc.	09/2003	10/2004	Immunology
Bar Ilan University, Ramat-Gan, Israel	Ph.D.	09/2004	10/2007	Immunology
National Institute on Aging, NIH, Baltimore, MD, USA	Post- Doctorate	2007	2011	Neuroscience

A. Personal Statement

Research at the Okun laboratory focuses on basic and translational Neuroimmunology. Specifically, the laboratory studies the mechanisms by which pregnancy with a Down syndrome (DS) fetus affects maternal prevalence for late-onset Alzheimer disease (AD) with an aim to develop effective prevention therapies. In addition, the laboratory studies how B-cells, a type of immune cells that produce antibodies, are involved in cognitive decline in AD and in DS-related AD. Insights from this study will be used to test current and future B-cell targeting interventions to ameliorate AD-related pathology.

B. Positions, Scientific Appointments and Honors

August 2011-February 2017 Senior Lecturer, The Mina and Everard Goodman Faculty of Life Sciences, Bar Ilan University, Ramat Gan, Israel.

February 2017-present Associate Professor, The Mina and Everard Goodman Faculty of Life Sciences, Bar Ilan University, Ramat Gan, Israel.

C. Contributions to Science

A.

Peer-reviewed Publications.

1. Early diagnosis and treatment of Alzheimer's disease by targeting toxic soluble A β oligomers. Habashi M, Vutla S, Tripathi K, Senapati S, Chauhan PS, Haviv-Chesner A, Richman M, Mohand SA, Dumulon-Perreault V, Mulamreddy R, **Okun E**, Chill JH, Guérin B, Lubell WD, Rahimipour S. *Proc Natl Acad Sci U S A*. 2022 Dec 6;119(49)
2. Sleeve Gastrectomy Reduces Glycemia but Does Not Affect Cognitive Impairment in Lean 5xFAD Mice. Samuel I, Ben-Haroush Schyr R, Arad Y, Attali T, Azulai S, Bergel M, Halfon A, Hefetz L, Hirsch T, Israeli H, Lax N, Nitzan K, Sender D, Sweetat S, **Okun E**, Rosenmann H, Ben-Zvi D. *Front Neurosci*. 2022 Aug 11;16:937663.
3. COVID-19 Vaccination of Individuals with Down Syndrome-Data from the Trisomy 21 Research Society Survey on Safety, Efficacy, and Factors Associated with the Decision to Be Vaccinated. Hüls A, Feany PT, Zisman SI, Costa ACS, Dierssen M, Balogh R, Bargagna S, Baumer NT, Brandão AC, Carfi A, Chicoine BA, Ghosh S, Lakhanpaul M, Levin J, Lunskey Y, Manso C, **Okun E**, Real de Asua D, Rebillat AS, Rohrer TR, Sgandurra G, Valentini D, Sherman SL, Strydom A, On Behalf Of The Trisomy Research Society Covid-Initiative. *Vaccines (Basel)*. 2022 Mar 29;10(4):530.

4. HCAR1-Mediated L-Lactate Signaling Suppresses Microglial Phagocytosis. Nicola R, Madar R, **Okun E**. *Neuromolecular Med.* 2022 Apr 11. doi: 10.1007/s12017-022-08710-5.
5. Integrative epigenomic and transcriptomic analyses reveal metabolic switching by intermittent fasting in brain. Ng GY, Sheng DPLK, Bae HG, Kang SW, Fann DY, Park J, Kim J, Alli-Shaik A, Lee J, Kim E, Park S, Han JW, Karamyan V, **Okun E**, Dheen T, Hande MP, Vemuganti R, Mallilankaraman K, Lim LHK, Kennedy BK, Drummond GR, Sobey CG, Gunaratne J, Mattson MP, Foo RS, Jo DG, Arumugam TV. *Geroscience.* 2022 Mar 31.
6. Physiology and pharmacology of amyloid precursor protein. Cho Y, Bae HG, **Okun E**, Arumugam TV, Jo DG. *Pharmacol Ther.* 2022 Feb 1;235:108122
7. Induction of an effective anti-Amyloid- β humoral response in aged mice. Illouz T, Madar R, Hirsh T, Biragyn A and **Okun E**. *Vaccine*, July 2021, Aug 9;39(34):4817-4829
8. Immune Dysregulation and the Increased Risk of Complications and Mortality Following Respiratory Tract Infections in Adults With Down Syndrome. Illouz T, Biragyn A, Florencia Iulita M, Flores-Aguilar L, Dierssen M, De Toma I, Antonarakis S.E, Yu E, Herault Y, Potier M.C, Botté A, Roper R, Sredni B, London J, Mobley W, Strydom A and **Okun E**. on behalf of T21RS COVID-19 Initiative. *Front. Immunol.*, 25 June 2021.
9. Therapeutic B-cell depletion reverses progression of Alzheimer's disease. Kim K, Wang X, Ragonnaud E, Bodogai M, Illouz T, DeLuca M, McDevitt R.A, Gusev F, **Okun E**, Rogaev E and Biragyn A. *Nat Commun.* 2021 Apr 12.
10. Adult Hippocampal Neurogenesis: One Lactate to Rule Them All. Nicola R and **Okun E**. *NeuroMolecular Medicine.* 19 April 2021.
11. Specific Susceptibility to COVID-19 in Adults with Down Syndrome. Illouz T, Biragyn A, Frenkel-Morgenstern M, Weissberg O, Gorohovski A, Merzon E, Green I, Iulita F, Flores-Aguilar L, Dierssen Sotos M, De Toma H, Lifshitz H, Antonarakis S.E, Yu E, Herault Y, Potier M.C, Botté A, Roper R, Sredni B, Sarid R, London J, Mobley W, Strydom A and **Okun E**. *NeuroMolecular Medicine.* 4 March 2021.
12. High-Intensity Functional Training: Molecular Mechanisms and Benefits. B. Zeev T and **Okun E**. *NeuroMolecular Medicine.* 01 January 2021.
13. Maternal antibodies facilitate Amyloid- β clearance by activating Fc-receptor-Syk-mediated phagocytosis. Illouz T, Nicola R, Ben-Shuhan L, Madar R, Biragyn R and **Okun E**. *Communications Biology.* 12 March 2021.
14. Mild physical activity does not improve spatial learning in a virtual environment. **Okun E**, B. Zeev T, Weiss I, Ashri S, Heled Y, Ketko I and Yanovich R. *Front. Behav. Neurosci.* 17 november 2020.
15. The effects of High-Intensity Functional Training (HIFT) on spatial learning, visual pattern separation and attention span in adolescents. **Okun E**, Ben-Zeev T, Hirsh T, Weiss I and Gornstein M. *Front. Behav. Neurosci.* 21 August 2020.
16. Food and Age: It Takes Two to Degenerate. Nicola R and **Okun E**. *Front. Aging Neurosci.*, 26 June 2020.
17. A modified Barnes maze for an accurate assessment of spatial learning in mice. Illouz T, Madar R and Okun E. *J Neurosci Methods.* Jan 2020.
18. Lev-Vachnisch Y, Cadury S, Rotter-Maskowitz A, Noa Feldman, Asael Roichman, Tomer Illouz, Alexander Varvak, Raneen Nicola, Ravit Madar, **Eitan Okun**. L-Lactate Promotes Adult Hippocampal Neurogenesis. *Front Neurosci.* 2019;13:403. 2019 May 24.
19. Tomer Illouz, Ravit Madar, Arya Biragyn and **Eitan Okun**. Restoring microglial and astroglial homeostasis using DNA immunization in a Down Syndrome mouse model. *Brain, Behaviour and Immunity*, 75, 163-180, Jan 2019.
20. De Lorenzo G, Ferrari S, Cervone F, **Okun E**. Extracellular DAMPs in Plants and Mammals: Immunity, Tissue Damage and Repair. *Trends Immunol.* 2018 Oct 4. pii: S1471-4906(18)30171-6.
21. Shmueli A, Shalit T, **Okun E**, Shohat-Ophir G. The Toll Pathway in the Central Nervous System of Flies and Mammals. *Neuromolecular Med.* 2018 Oct 1. doi: 10.1007/s12017-018-8515-9
22. Lavian H, Loewenstern Y, Madar R, Almog M, Bar-Gad I, **Okun E**, Korngreen A. Dopamine receptors in the rat entopeduncular nucleus. *Brain Struct Funct.* 2018 Mar 22.
23. Griffioen K, Mattson MP, **Okun E**. Deficiency of Toll-like receptors 2, 3 or 4 extends life expectancy in Huntington's disease mice. *Heliyon.* 2018 Jan 18;4(1):e00508.
24. Illouz T, Madar R, Griffioen K, **Okun E**. A protocol for quantitative analysis of murine and human amyloid- β_{1-40} and $_{1-42}$. *J Neurosci Methods.* 2017 Nov 1;291:28-35.
25. Lavian H, Almog M, Madar R, Loewenstern Y, Bar-Gad I, **Okun E**, Korngreen A. Dopaminergic modulation of synaptic integration and firing patterns in the rat entopeduncular nucleus. *J Neurosci.* 2017 Jun 26. pii: 0639-17.
26. **Okun E**, Marton D, Cohen D, Griffioen K, Kanfi Y, Illouz T, Madar R, Cohen HY. Sirt6 alters adult hippocampal neurogenesis. *PLoS One.* 2017 Jun 23;12(6):e0179681
27. Betzer O, Shilo M, Opoichinsky R, Barnoy E, Motiei M, **Okun E**, Yadid G, Popovtzer R. The effect of nanoparticle size on the ability to cross the blood-brain barrier: an in vivo study. *Nanomedicine (Lond).* 2017 Jul;12(13):1533-1546

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29. Illouz T, Madar R, Clague C, Griffioen K, Louzoun Y and **Okun E**. Unbiased classification of spatial strategies in the Barnes maze. *Bioinformatics*. 2016 July 4.
30. Illouz T, Madar R, Louzon Y, Griffioen KJ, **Okun E**. Unraveling cognitive traits using the Morris water maze unbiased strategy classification (MUST-C) algorithm. *Brain Behav Immun*. 2015 Oct 24.
31. Ravit Madar, Aviva Rotter, Hiba Waldman Ben-Asher, Mohamed R. Mughal, Thiruma V. Arumugam, Wood WH 3rd, Becker KG, Mark P. Mattson and **Eitan Okun**. Postnatal TLR2 activation impairs learning and memory in adulthood. *Brain, Behavior and Immunity*, 2015 Aug;48:301-12
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33. Illouz T, **Okun E**. No ECSIT-stential evidence for a link with Alzheimer's disease yet (retrospective on DOI 10.1002/bies.201100193). *Bioessays*. 2014 Nov 4.
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41. Barak B, Shvarts-Serebro I, Modai S, Gilam A, **Okun E**, Michaelson DM, Mattson MP, Shomron N, Ashery U. Opposing actions of environmental enrichment and Alzheimer's disease on the expression of hippocampal microRNAs in mouse models. *Transl Psychiatry*. 2013 Sep 10;3:e304.
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55. Griffioen K, Wan R, **Okun E**, Wang X, Lovett-Barr MR, Mughal RM, Greig N, Mendelowitz D, Mattson MP. GLP-1 receptor stimulation depresses spectral measures of heart rate variability and inhibits neurotransmission to cardiac vagal neurons. *Cardiovascular research*. *Cardiovasc Res*. 2011 Jan 1;89(1):72-8.
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Articles and Chapters in Books

1. **Okun E**, Mattson MP. Neuronal Vulnerability to Oxidative Damage in Aging. Oxidative Neural Injury. 2009 83-95.
2. Arumugam TV, **Okun E**, and Mattson MP. Basis of Ionic dysregulation in Cerebral Ischemia. New strategies in stroke intervention. Ionic transporters, Pumps and New Channels. 2009 1-12.
3. **Okun E**, Chen R and Mark P. Mattson. Roles of Inflammation and Innate Immunity in the Aging Brain: Inflammation, Life Style and Chronic Diseases: The Silent Link.