



Ayal Ben-Zvi - CURRICULUM VITAE

The Department of Developmental Biology and Cancer Research

Institute for Medical Research IMRIC

Faculty of Medicine, The Hebrew University of Jerusalem

Ein-Kerem Campus, Jerusalem, Israel. • Tel: 058-4219918

Ayalb@ekmd.huji.ac.il

Date of birth: 25/03/1976

Education

- 2010-2014 Postdoctoral Fellow under the supervision of Dr. Chenghua Gu at the Department of Neurobiology, Harvard Medical School
- 2004-2009 Ph.D. under the supervision of Dr. Oded Behar ; Title of thesis: "Differentiation, Outgrowth and Cell Death in the Developing Sensory Nervous System". Faculty of Medicine, The Hebrew University of Jerusalem, Israel.
- 2003-2004 M.Sc. Developmental Biology, Master's without thesis (prerequisite for the direct Ph.D. program), Faculty of Medicine, The Hebrew University of Jerusalem, Israel.
- 2000-2002 B.Sc. Biology, The Hebrew University of Jerusalem, Israel.

Appointment

- 2021 - Associate Professor, The Department of Developmental Biology and Cancer Research, Institute for Medical Research IMRIC, Faculty of Medicine, The Hebrew University of Jerusalem.
- 2021 - Head Committee for advanced studies, Faculty of Medicine, The Hebrew University of Jerusalem.
- 2014-2021 Senior lecturer (Principle Investigator), The Department of Developmental Biology and Cancer Research, Institute for Medical Research IMRIC, Faculty of Medicine, The Hebrew University of Jerusalem.
- 2010-2014 Postdoctoral Fellow under the supervision of Dr. Chenghua Gu at the Department of Neurobiology, Harvard Medical School
- 2003-2009 Teaching Assistant, Faculty of Medicine, The Hebrew University of Jerusalem. Courses in Histology and Biology (medical, dentistry and medical sciences).

Awards

- 2019 The Chor Award for cardio-vascular research by the Louis Chor Memorial Fund.
- 2019 The Prusiner-Abramsky Research Award in Clinical and Basic Neuroscience by The Orion Foundation, Israel.
- 2018 Rector's list of excellence in teaching at the Hebrew University.
- 2015 The Werner-Risau-Prize- awarded by the German Society for Cell Biology (DGZ).
- 2015 The Yegal Alon national award - awarded by the national Planning & Budgeting Committee, Israel.
- 2014 The Golda Meir Fellowship
- 2013 The National Postdoc Appreciation Week HMS/HSDM Research Day Award in recognition of outstanding poster presentation.
- 2012 The Lefler Postdoctoral Fellowship
- 2010 The Goldenson Postdoctoral Fellowship
- 2009 The Harold Perlman Postdoctoral Fellowship – A Rector award to support a Ph.D. of the Hebrew University conducting his postdoctoral fellowship at Harvard University
- 2008 The Ahron Katzir Student Travel Fellowship
- 2008 A fellowship for the EMBO Workshop – "Semaphorin Function and mechanisms of Action", provided by the "Ecole des Neurosciences de Paris"
- 2007 The Triennial Doris Cecelia Levy Memorial Seminar in Brain Research Award
- 2007 The Johanna Friedlaender Memorial Prize in Excellence at the Hebrew University of Jerusalem. (A Doctorate Fellowship).
- 2005 The Sheffield Award for Cancer Research.

Membership in a professional association

- 2008 The society for Neuroscience.
- 2014 The International Brain Barriers Society (IBBS).
- 2014 The Israeli Society of Developmental Biology (IsSDB).
- 2019 Co-founder of the Israeli Neuro-Vascular-Unit Forum (I-NVU).
- 2019 European Vascular Biology organisation (EVBO).

Publications

1. Sasson E, Anzi S, Bell B, Yakovian O, Zorsky M, Deutsch U, Engelhardt B, Sherman E, Vatine G.D, Dzikowski R, **Ben-Zvi A**. (2021) Nano-scale Architecture of Blood-Brain Barrier Tight-Junctions. *Elife* 24;10:e63253. doi: 10.7554/eLife.63253.
2. Rimmerman N., Verdiger H., Goldenberg H., Naggan L., Robinson E., Kozela E., Gelb S., Reshef R., Ryan K.M, Ayoun L., Refaeli R., Ashkenazi E., Schottlender N., Ben Hemo Cohen L., Pienica C., Aharonian M., Dinur E., Lazar K., McLoughlin D.M, **Ben-Zvi A**, Yirmiya R. (2021) Microglia and their LAG3 checkpoint underlie the antidepressant and neurogenesis-enhancing effects of electroconvulsive stimulation. *Mol Psychiatry* doi: 10.1038/s41380-021-01338-0.
3. **Ben-Zvi A**, and Liebner S. (2021) Developmental regulation of barrier- and non-barrier blood vessels in the CNS (Review). *J Intern Med* doi: 10.1111/joim.13263.
4. Licht T, Sasson E, Bell B, Grunewald M, Kumar S, Kreisel T, **Ben-Zvi A**, Keshet E. (2020) Hippocampal neural stem cells facilitate access from circulation via apical cytoplasmic processes. *Elife*. 4;9:e52134. doi: 10.7554/eLife.52134.
5. Bar O, Gelb S, Atamny K, Anzi S, **Ben-Zvi A**. (2020) Angiomodulin (IGFBP7) is a cerebral specific angiocrine factor, but is probably not a blood-brain barrier inducer. *Fluids and Barriers CNS*. 1;17(1):27. doi:10.1186/s12987-020-00188-2.
6. Lax N, Fainstein N, Nishri Y, **Ben-Zvi A**, Ben-Hur T. 2020 Systemic microbial TLR2 agonists induce neurodegeneration in Alzheimer's disease mice. *J Neuroinflammation*. 14;17(1):55. doi: 10.1186/s12974-020-01738-z.
7. Nitzan K, Benhamron S, Valitsky M, Kesner E, Lichtenstein M, **Ben-Zvi A**, Ella E, Saada A, Lorberboum-Galski H, Rosenmann H. (2019) Mitochondrial transfer ameliorated disease deficits in Alzheimer's disease-mice. *Journal of Alzheimer's Disease*. 2019;72(2):587-604. doi:10.3233/JAD-190853.
8. Stock AD, Der E, Gelb S, Huang M, Weidenheim K, **Ben-Zvi A**^{*}, Putterman C. (2019) Tertiary lymphoid structures in the choroid plexus in neuropsychiatric lupus. *JCI Insight*. 6;4(11). pii: 124203. doi: 10.1172/jci.insight.124203. *Co-senior author
9. Corem N, Anzi S, Gelb S, **Ben-Zvi A**. (2019) Leptin receptor deficiency induces early, transient and hyperglycaemia-independent blood-brain barrier dysfunction. *Sci Rep*, 27;9(1):2884. doi: 10.1038/s41598-019-39230-1.
10. Gelb S, Stock AD, Anzi S, Putterman C, **Ben-Zvi A**. (2018) Mechanisms of neuropsychiatric lupus: The relative roles of the blood-cerebrospinal fluid barrier versus blood-brain barrier. *J Autoimmun* 91:34-44. doi: 10.1016/j.jaut.2018.03.001.
11. Ariel D. Stock, **Ayal Ben-Zvi**, Chaim Putterman. "Current concepts in the pathogenesis of neuropsychiatric lupus", 2017, chapter 23, Book name; Dubois' Lupus Erythematosus and Related Syndromes, 9th edition, Elsevier, Philadelphia, PA 19103-2899, USA.
12. Andreone BJ, Chow BW, Tata A, Lacoste B, **Ben-Zvi A**, Bullock K, Deik AA, Ginty DD, Clish CB, Gu C. (2017) Blood-Brain Barrier Permeability Is Regulated by Lipid Transport-Dependent Suppression of Caveolae-Mediated Transcytosis. *Neuron* 3;94(3):581-594.e5. doi: 10.1016/j.neuron.2017.03.043.
13. Stock AD, Gelb S, Pasternak O, **Ben-Zvi A**^{*}, Putterman C. (2017) The Blood Brain Barrier and Neuropsychiatric Lupus: New perspectives in light of advances in understanding the neuroimmune interface. *Autoimmunity Reviews* 16(6):612-619. *Co-corresponding author.
14. Almasi S, **Ben-Zvi A**, Lacoste B, Gu C, Miller EL, Xu X. (2017) Joint volumetric extraction and enhancement of vasculature from low-SNR 3-D fluorescence microscopy images. *Pattern Recognition* 63:710-718. <http://doi.org/10.1016/j.patcog.2016.09.031>
15. Licht T, Dor-Wollman T, **Ben-Zvi A**, Rothe G, Keshet E. (2015) Vessel maturation schedule determines vulnerability to neuronal injuries of prematurity. *J Clin Invest*. pii: 79401. doi: 10.1172/JCI79401.

16. **Ben-Zvi A.** (2015) MFSD2A is critical for the formation and function of the blood brain barrier (Werner Risau Prize 2015). *Cell News* 2:15 (41):19-21 DGZ http://zellbiologie.de/cellnews/archive/CellNews_02_15/index.html#18
17. Almasi S, Xu X, **Ben-Zvi A**, Lacoste B, Gu C, Miller EL. (2014) A novel method for identifying a graph-based representation of 3-D microvascular networks from fluorescence microscopy image stacks. *Med Image Anal.* 20(1);208-23. doi: 10.1016/j.media.2014.11.007.
18. Hagan N, **Ben-Zvi A.** (2014) The molecular, cellular, and morphological components of blood-brain barrier development during embryogenesis (Review) *Seminars - Cell and Dev. Biol.* doi: 10.1016/j.semcdb.2014.12.006.
19. Lacoste B, Comin CH, **Ben-Zvi A**, Kaeser PS, Xu X, Costa Lda F, Gu C. (2014) Sensory-related neural activity regulates the structure of vascular networks in the cerebral cortex. *Neuron.* 3;83(5):1117-30.
20. Gazit R, Mandal PK, Ebina W, **Ben-Zvi A**, Nombela-Arrieta C, Silberstein LE, Rossi DJ. (2014) Fgd5 identifies hematopoietic stem cells in the murine bone marrow. *J Exp Med.* 30;211(7):1315-31.
21. Tata A, Stoppel D.C, Hong S, **Ben-Zvi A**, Xie T, Gu C. (2014) An image-based RNAi screen identifies SH3BP1 as a key effector of Semaphorin3E-PlexinD1 signaling. *Journal of Cell Biology.* 26;205(4):573-90.
22. **Ben-Zvi A**, Lacoste B, Kur E, Andreone B.J, Mayshar Y, Yan H, Gu C. (2014) MFSD2A is critical for the formation and function of the blood brain barrier. *Nature.* 22;509(7501):507-11.
23. **Ben-Zvi A**, Sweetat S, Behar O. (2013) Elimination of aberrant DRG circuitries in Sema3A mutant mice leads to extensive neuronal deficits. *PLoS One.* 26;8(7):e70085. doi: 10.1371
24. **Ben-Zvi A**, Manor O, Schachner M, Yaron A, Tassier-Lavigne M, Behar O (2008) The Semaphorin receptor PlexinA3 mediates neuronal apoptosis during dorsal root ganglia development. *J Neurosci.* 19;28(47):12427-32.
25. **Ben-Zvi A**, Ben-Gigi L, Yagil Z, Lerman O, Behar O (2008) Semaphorin3A regulates axon growth independently of growth cone repulsion via modulation of TrkA signaling. *Cell Signal.* 20:467-79.
26. **Ben-Zvi A**, Ben-Gigi L, Klein H, Behar O (2007) Modulation of Semaphorin3A activity by p75 neurotrophin receptor influences peripheral axon patterning. *J Neurosci.* 27:13000-11.
27. Lerman O, **Ben-Zvi*** A, Yagil Z, Behar O (2007) Semaphorin3A accelerates neuronal polarity in vitro and in its absence the orientation of DRG neuronal polarity in vivo is distorted. *Mol Cell Neurosci.* 36:222-34. *Equal contribution.
28. **Ben-Zvi A**, Yagil Z, Hagalili Y, Klein H, Lerman O, Behar O (2006) Semaphorin 3A and neurotrophins: a balance between apoptosis and survival signaling in embryonic DRG neurons. *J Neurochem.* 96:585-97.

Patents

Inventor of patent pending technology for Blood Brain Barrier modulation:
Provisional patent application titled "Methods and compositions relating to modulation of the permeability of the blood brain barrier", filed June 21, 2013, pending