

Maayan Merhav, PhD

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Fields of Interest

Cognitive Neuroscience: Learning & Memory, Cognitive Aging & Spatial Cognition.

Education

- **2009 - 2014:** PhD at the Sagol department of Neurobiology, University of Haifa; Thesis supervisors: Dr. Asaf Gilboa (University of Toronto, Rotman Research Institute, gilboalab.weebly.com/) and Prof. Avi Karni (University of Haifa).
Title of thesis: Learning through Fast Mapping in Adults; Behavioral and Neuro-Anatomical Properties.
- **2004 - 2006:** MSc at the Sagol department of Neurobiology, University of Haifa, *Summa cum laude*. Thesis supervisor: Prof. Kobi Rosenblum (neurosenblum.haifa.ac.il/).
Title of thesis: Functional Interactions between Two Unimodal Inputs and Regulation on Translation Initiation, in Taste-Memory Consolidation.
- **2000 - 2003:** BSc in Life Sciences (Biology), at the Hebrew University of Jerusalem.

Employment

- **2020 - 2021:** A scholar at the Ministry of science, Yitzhak Shamir scholarship for returning Israeli scientists, at the Faculty of Architecture and Town Planning, Technion, Israeli institute of Technology. Research Topic: Environments for the Aging Brain. Group leader: Prof. Dafna Fisher-Gewirtzman.
- **2017 - 2019:** A post-doctoral fellow at the Memory Lab (memorylab.hw.ac.uk/), Heriot-Watt University, Edinburgh, UK*. Group leader: Dr Michaela Dewar. *The research took place at the Aging and Cognition Research group, DZNE, Magdeburg, Germany.
- **2014 - 2017:** A post-doctoral fellow at the Aging & Cognition Research Group (wolberslab.net/), at the German Center for Neurodegenerative Diseases (DZNE) of the Helmholtz Institute, Magdeburg, Germany. Group leader: Prof. Thomas Wolbers.
- **2007 - 2009:** A full-time research assistant at the Multiple Sclerosis & Brain Research Center, the laboratory of Prof. Ariel Miller at the Faculty of medicine, the Technion, Haifa, Israel.
- **Summer 2005:** Visiting student at the laboratory of Prof. Eric Klann, at the Baylor College of Medicine Houston, Texas.
- **2003 - 2004:** A full-time research assistant at the Center for Research of Brain and Behavior, University of Haifa.
- **1999:** Product developer assistant at 'Carmel Medical Acoustic Devices'.

Teaching Experience

- **Spring semester 2021:** Teaching the course 'Introduction to Psychobiology' at the Department of Education, Tel-Hai Academic College.
- **Spring semesters 2020 and 2021:** Develop and teach the course 'Virtual Reality as an Educational Tool' at the Department of Education, Tel-Hai Academic College.
- **Spring semesters 2018 and 2019:** Teaching at the 'Learning and Memory' course of the "MSc Integrative Neuroscience" program, in the Otto-von-Guericke University, Magdeburg.

- **2007-2009:** Volunteering @ Nitsan, Haifa: Guiding music lessons to mentally challenged adults.
- **1996-1998:** Army service: Teaching Hebrew for immigrants at an elementary school.

Guiding and Mentoring Students

- **2019:** Mentoring the Bachelor Thesis of Maria Tom, at the laboratory of Prof. Thomas Wolbers. “The effects of wakeful rest on types of navigational memory”.
- **2016:** Mentoring the Bachelor Thesis of Alina Sahl, at the laboratory of Prof. Thomas Wolbers. “Age Related Proactive-Interference to Object-location Associations, in a 3D Environment: Testing Egocentric and Allocentric Encoding Strategies”.
- **2013:** Guiding a Master Thesis of Sheli Ben-Israel together with Prof. Asaf Gilboa. “Flexibility of the Association Between an Object, a Label, and Semantic Information Formed via Fast Mapping”.
- **2011:** Guiding the Master Thesis of Hadeel Awad, together with Prof. Avi Karni. “Selective Off-line Mnemonic Processing Following Semantic Knowledge Acquisition via Fast Mapping”.
- **2010:** Mentoring the Bachelor Thesis of Maayan Harel, at the laboratory of Prof. Asaf Gilboa.

Academic-Related Activities

- **2016-2018:** Coordinating the spatial cognition journal club, at the DZNE, Magdeburg.
- **2016:** Organizing the 1st ‘Interdisciplinary Symposium on Spatial Cognition in Aging & Neurodegeneration’ (iSCAN), Magdeburg, Germany.

Research Scholarships

- The Ministry of Science, Yitzhak Shamir Scholarship for Returning Israeli Scientists: “Environments for the Aging Brain”. A two-year postdoc at the Technion. 2020-2021.
- PhD Scholarship for Excellence, University of Haifa. 2009-2013.
- MSc Scholarship for Excellence, University of Haifa. 2004-2006.

Prizes and Awards

- A prize for excellence from the Wolf foundation, 2011.
- The rector’s prize for the best thesis of the year. University of Haifa. 2007.
- The department's award of excellence. The neurobiology department. University of Haifa. 2006.

Peer Reviewed Publications in Scientific Journals

1. **Merhav M** and Wolbers T. (2019). Aging and spatial cues influence the updating of navigational memories. *Scientific Reports*. Impact factor = 4.01, Q1.
2. **Merhav M**, Riemer M and Wolbers T. (2019). Spatial updating deficits in human aging are associated with traces of former memory representations. *Neurobiology of Aging*. Impact factor = 4.4, Q1.
3. A Frid, H Hazan, E Koilis, LM Manevitz, **M Merhav**, G Star (2016). The Existence of Two Variant Processes in Human Declarative Memory: Evidence Using Machine Learning Classification Techniques in Retrieval Tasks. *Transactions on Computational Collective Intelligence XXIV*, 117-133
4. **Merhav M**, Karni A and Gilboa A. (2015). Not all declarative memories are created equal: Fast Mapping as a direct route to cortical declarative representations. *NeuroImage*. Impact factor = 6.45, Q1.
5. **Merhav M**, Karni A and Gilboa A. (2014). Neocortical catastrophic interference in healthy and amnesic adults: A paradoxical matter of time. *Hippocampus*. Impact factor = 4.16, Q1.
6. Mandel I, Paperna T, Volkowich A, **Merhav M**, Glass-Marmor L and Miller A (2012). The ubiquitin–proteasome pathway regulates claudin 5 degradation. *Cell Bioch*. Impact factor = 3.63, Q1.

7. **Merhav M**, Rosenblum K. (2008). Facilitation of taste memory acquisition by experiencing previous novel taste is protein-synthesis dependent. *Learn Mem.* Impact factor = 5.85, Q1.
8. Antion MD, **Merhav M**, Hoeffler CA, Reis G, Kozma SC, Thomas G, Schuman EM, Rosenblum K, Klann E. (2008). Removal of S6K1 and S6K2 leads to divergent alterations in learning, memory, and synaptic plasticity. *Learn Mem.* Impact factor = 5.85, Q1.
9. **Merhav M**, Kuulmann-Vander S, Elkobi A, Jacobson-Pick S, Karni A, Rosenblum K. (2006). Behavioral interference and C/EBP β expression in the insular-cortex reveal a prolonged time period for taste memory consolidation. *Learn Mem.* Impact factor = 5.32, Q1.
10. Yefet K, **Merhav M**, Kuulmann-Vander S, Elkobi A, Belelovsky K, Jacobson-Pick S, Meiri N, Rosenblum K. (2006). Different signal transduction cascades are activated simultaneously in the rat insular cortex and hippocampus following novel taste learning. *Eur J Neurosci.* Impact factor = 4.0, Q1.
11. Banko JL, **Merhav M**, Stern E, Sonenberg N, Rosenblum K, Klann E. (2006). Behavioral alterations in mice lacking the translation repressor 4E-BP2. *Neurobiol Learn Mem.* Impact factor = 4.24, Q1.
12. Akirav I, Khatsrinov V, Vouimba RM, **Merhav M**, Ferreira G, Rosenblum K, Maroun M. (2006). Extinction of conditioned taste aversion depends on functional protein synthesis but not on NMDA receptor activation in the ventromedial prefrontal cortex. *Learn Mem.* Impact factor = 5.32, Q1.

Manuscripts in progress

1. Merhav M Age-related deficit in updating long-term associations is dependent on the encoding mechanism. *In preparation.*
2. Merhav M and Wolbers T. The Influence of spatial-cue reliability on navigational performance of young and older adults. *In preparation.*
3. Merhav M, Hasselmo M, Wolbers T and Dewar M. Post-encoding sustained attention impairs memory consolidation. *In preparation.*
4. Merhav M, Hasselmo M, Wolbers T and Dewar M. Shifts in hippocampal-entorhinal connectivity during encoding and consolidation. *In preparation.*

Articles in Conference Proceedings

1. A Frid, H Hazan, E Koilis, LM Manevitz, M Merhav, G Star (2015). Machine learning techniques and the existence of variant processes in humans declarative memory. 7th International Joint Conference on Computational Intelligence (IJCCI ...
2. M Merhav, A Karni, A Gilboa (2012). New semantic learning through Fast Mapping is susceptible to Catastrophic Interference. *JOURNAL OF MOLECULAR NEUROSCIENCE* 48, S79-S80
3. E Staun-Ram, T Paperna, M Merhav, N Avidan, A Miller (2009). The involvement of cathepsins and their inhibitors cystatins in immune cell migration: implications to multiple sclerosis. *MULTIPLE SCLEROSIS* 15 (9), S70-S70
4. M Maroun, I Akirav, V Khatsrinov, RM Vouimba, M Merhav, G Ferreira, ... (2006). Extinction of conditioned taste aversion depends on functional... *Learning & Memory* 13, 254-258
5. M Merhav, K Belelovsky, K Rosenblum, E Klann, MD Antion (2005). 5"TOP and Cap dependent translation modulate taste learning and memory. *REVIEWS IN THE NEUROSCIENCES* 16, S47-S47
6. E Stern, M Merhav, M Costa-Mattioli, N Sonenberg, K Rosenblum (2005). Initiation regulation of eIF2 α during taste learning and consolidation. *REVIEWS IN THE NEUROSCIENCES* 16, S62-S63
7. HK Motanis, I Akirav, R Vouimba, M Merhav, K Rosenblum, M Maroun (2005). Exposure to behavioral stress impairs extinction of conditioned taste aversion. *REVIEWS IN THE NEUROSCIENCES* 16, S48-S48

Selected Posters and Oral Presentations

1. The Interdisciplinary Symposium on Spatial Cognition in Aging & Neurodegeneration (iSCAN), 2018. *Poster*. How the navigational strategy affects spatial memory and spatial updating, in young and old adults?
2. Replay@CUBRIC 2018, Cardiff, UK. *Poster*. Does post-encoding, sustained attention impair memory consolidation?
3. The Israeli Conference on Cognitive research, 2018. Acre, Israel. *Poster*. How the navigational strategy affects spatial memory and spatial updating, in young and old adults?
4. The Israeli Conference on Cognitive research, 2017. Acre, Israel. *Poster*. Age-Related Deficit in Spatial Updating and Inefficient Suppression of Old Memories.
5. The Interdisciplinary Symposium on Spatial Cognition in Aging & Neurodegeneration (iSCAN), 2016. *Poster*. Age related deficit in updating object-location associations.
6. The International Conference on Memory (iCOM), 2016, Budapest, Hungary. *Oral presentation*: Do memory representations gained via Fast-Mapping undergo changes in time?
7. The International Conference on Memory (iCOM), 2016, Budapest, Hungary. *Poster*: Does age-related proactive interference impair navigation?
8. Psychology and Brain 2016, Berlin, Germany: *Oral presentation*. Proactive interference as a source for age related navigational deficit.
9. The SFN annual meeting, 2016, Chicago, USA. *Poster*: Proactive interference as a source for age related navigational decline.
10. The annual Neuropsychology conference, 2013, Haifa, Israel. *Poster*: Neural substrates of rapid neocortical semantic learning.
11. The ISFN annual meetings, 2011, Eilat, Israel. *Poster*: New semantic learning through Fast Mapping is susceptible to catastrophic interference.
12. The SFN annual meeting, 2006, Atlanta, Georgia, USA. *Poster*: Testing the "tagging hypothesis" in taste learning.
13. The SFN annual meeting, 2006, Atlanta, Georgia. *Poster*: Alterations in synaptic plasticity and impaired learning and memory in p70S6K knock-out mice.
14. The SFN annual meeting, 2005, Washington DC. USA. *Poster*: What does it take to make a stable taste-memory?

Research Related Experience

- Design and administration of scientific research, statistical analyses, scientific writing.
- Behavioral and neurocognitive methodologies.
- Virtual reality methods, eye tracking and motion tracking.
- Neuroimaging (fMRI), including high resolution imaging (7 Tesla fMRI).
- Functional connectivity analyses (DCM, PLS).
- Machine learning techniques (MVPA, RSA).
- Computing: Microsoft office, SPSS, e-prime, psychopy, MatLab, SPM, AFNI, Vizard and more...
- Experience in protein, DNA and RNA analyses, and in histology and micro injections.

Languages

Hebrew - native language; English - fluent; German – basic.

Training

- Advanced SPM course, 2017, Edinburgh.
- A workshop in manual segmentation of hippocampal sub-field, 2016, Magdeburg.

- SPM course, 2015, Zurich.