

Melis Yilmaz Balban, PhD

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PERSONAL SUMMARY

As a postdoctoral researcher, I built the Huberman VR lab at Stanford University Department of Neurobiology, where we combine virtual visual stimulation with neurophysiological and behavioral measurements to understand fearful emotional state in humans. I enjoy experiment design, data collection, analysis and presentation. Stanford School of Medicine Magazine story of my research: <http://stanmed.stanford.edu/2017summer/huberman-virtual-reality-curing-fear-anxiety.html>

SKILLS SUMMARY

Experimental Design: Designing behavioral experiments from scratch in humans and animals, custom building software and hardware for behavioral testing, familiarity with existing behavioral assays in mice and humans, recording and analyzing human physiological and behavioral data, mouse survival surgeries, breeding transgenic mouse lines, tissue harvest, immunohistochemistry, confocal microscopy, molecular biology techniques

Virtual Reality: Shooting and producing 360 Videos, combining virtual reality with human physiology

Data analysis: MATLAB, R, Excel, C, Igor

Communication: Initiating collaborations across disciplines (e.g. VR, neurobiology), connecting people with common interest in VR, Publishing scientific papers, oral presentations to different audiences (general public and scientists) and large groups, conference presentations, collaborations with different laboratories.

EDUCATION

Harvard University, Cambridge MA; 05/2015
Doctor of Philosophy in Molecular and Cellular Biology
Thesis advisor: Markus Meister

Stanford University, Stanford CA; GPA: 3.45/4.00 06/2008
Bachelor of Science in Biological Sciences with Honors, Specialization in Neuroscience

RESEARCH EXPERIENCE

Stanford University, Stanford CA. Huberman Laboratory. Postdoctoral fellow 05/2016-Present

- A Virtual Reality Based Neurobehavioral Study of Human Defensive State

Stanford School of Medicine Magazine story of my research:
<http://stanmed.stanford.edu/2017summer/huberman-virtual-reality-curing-fear-anxiety.html>

California Institute of Technology, Pasadena CA. Meister Laboratory. Post-doctoral fellow ¹ 05/2015-04/2016

- Continued PhD research on dissecting roles of specific neural circuits in the retina on mouse visual behavior

Harvard University, Cambridge MA. Meister Laboratory. PhD. 05/2010-05/2015

- Thesis title: Roles of retinal circuits in the innate visual behaviors of mice.
- Discovered and characterized a novel visually guided behavior in mice (See Yilmaz and Meister, 2013).
- Used transgenic and viral methods to ablate specific neural circuits in the retina and the brain, tested their roles on different visually guided behaviors
- Developed methods to automatically measure behaviors of freely moving mice.
- Set-up behavioral assays such as the optokinetic reflex, pupil constriction reflex and light-dark box in our lab.
- Studied air-righting reflex in mice using high speed video recording.

¹ Maternity leave from 08/2015-04/2016

- Stanford University**, Stanford CA. Shen Laboratory. Life Science Research Assistant 08/2008-06/2009
- Continued undergraduate research on synaptic development and maintenance.
- Stanford University**, Stanford CA. Shen Laboratory. Undergraduate Researcher 03/2006-06/2008
- Performed a forward genetic screen for defects in synaptic development and maintenance in *Caenorhabditis elegans*.
 - Discovered and characterized the role of *unc-43*/CamKinase II in the maintenance of presynaptic structures. Submitted an undergraduate honors thesis to the Department of Biology.
- Stanford University**, Stanford CA. Boroditsky Laboratory. Undergraduate researcher. 10/2004-06/2005
- Assisted research on the correlation between cognitive and linguistic differences among native speakers of Turkish and English.
- University of Chicago**, Chicago IL . Lamppa Laboratory 06/2003-08/2003
- Upon invitation, conducted research on protein import pathways into the chloroplast.

FELLOWSHIPS AND AWARDS

- Stanford School of Medicine Dean's Postdoctoral Fellowship 07/2016- 07/2017
- Herchel Smith Graduate Fellowship 2009-2011
- Peirce Fellowship 2009-2010

TEACHING EXPERIENCE

- California Institute of Technology**
- Mentor for two undergraduate research students and a graduate student 06/2013-08/2015
- Harvard University**
- Teaching Fellow for Cellular Basis of Neuronal Function Course (Instructor: Dr. Venkatesh N. Murthy) 08/2011-12/2011
 - Teaching Fellow for Introduction to Neurobiology and Behavior Course (Instructors: Dr. Joshua Sanes, Dr. Jeff Lichtman) 08/2010-12/2010
- Stanford University Department of Biology**, Stanford CA
- Course Assistant (CA) intern in Biology Core Laboratory Course, Cell Biology section 03/2008-06/2008

PUBLICATIONS AND PRESENTATIONS

- Innovations in Psychiatry and Behavioral Health: Virtual Reality and Behavior Change Conference, Stanford CA**
 Poster Presentation and VR demo: Behavioral and Autonomic Measurements of the Human Fear State Accessed Through Virtual Reality. Melis Yilmaz Balban PhD, Andrew Huberman PhD 10/2017
- Stanford Brainstorm Launch Event**
 Gave a talk and presented a VR demo on the Behavioral and Autonomic Measurements of the Human Fear State 10/2017
- Ventromedial hypothalamic neurons control a defensive emotion state** 02/2015
 Prabhat S. Kunwar, Moriel Zelikowsky, Ryan Remedios, Haijiang Cai, Melis Yilmaz Balban, Markus Meister and David J. Anderson. eLife 2015;10.7554/eLife.06633.
- Society for Neuroscience Conference, Washington DC** 11/2014
 Poster Presentation. Roles of retinal circuits in visual behaviors of mice
- Rapid innate defensive responses of mice to looming visual stimuli.** 10/2013
 Yilmaz M., and Meister M. (2013). Current Biology. 23, 2011-2015.
- Society for Neuroscience Conference, New Orleans** 10/2012
 Poster Presentation. Mouse Visual Behavior: Expanding the Repertoire
- Stanford Journal of Neuroscience**, Volume II Issue I Fall 2009
 A novel role of *unc-43*/CaM Kinase II in maintaining the integrity of the presynaptic terminals in *Caenorhabditis elegans*.

LEADERSHIP

- Founder of Huberman VR Lab at Stanford 2016-present
- European Association at Stanford-Secretary 2006-2009
- Stanford Turkish Club- Leader of event organization team 2007-2008

INTERESTS

- Singing: classical Turkish Music, Boston Meyhanesi Band 09/2010-08/2012
- Piano: Certified by Associated Board of Royal Schools of Music (Grades 6 in Practice, Grade 5 in Theory)
- Languages: English, Turkish, German, Italian
- Sports: Skiing, Tennis, Yoga, Jogging