

BIOGRAPHICAL SKETCH

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NAME: Yilmaz Balban, Melis

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: Postdoctoral Fellow

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Stanford University, Stanford , CA	BS	06/2008	Biology
Harvard University, Cambridge, MA	PHD	05/2015	Molecular and Cellular Biology
California Institute of Technology, Pasadena, CA	Postdoctoral Fellow	08/2015	Continuing graduate work
Stanford University, Stanford , CA	Postdoctoral Fellow	present	Neurobiology

A. Personal Statement

My training in molecular biology, expertise in animal behavior and personal interest in human psychology combine to make me well-suited to carry out the research laid out in my proposal. I have a broad interest in understanding behaviors at the cellular level across different organisms. As an undergraduate at Stanford I worked on molecular basis of synapse development in the motor neurons of the earthworm *Caenorhabditis elegans*. I discovered a mutation, which caused a distinct behavioral abnormality: seizures that interrupt normal locomotion. I researched molecular interactions that led to this phenotype. While gathering expertise in molecular biology, I developed a stronger interest in animal behavior.

I pursued this interest in Markus Meister's lab at Harvard to explore visually guided behaviors in the mouse. This was relatively uncharted territory both for the lab and the field. I discovered and characterized a powerful visual behavior: mice exhibit fast avoidance responses such as escape or freezing to expanding dark stimuli from above. During the remainder of my PhD I characterized and published these results and, using cell-type-specific-ablations tested the roles of different retinal cell types in these and others visual behaviors. My discovery became a main research interest of many laboratories in visual and emotional neuroscience and led to many publications in the recent years. I personally developed interest in the integration of sensory inputs with emotional states in the face of threat and extending this work to more sophisticated model organisms and humans.

Concurrently the Huberman Lab, had exciting results regarding the brain regions involved in the modulation of the looming behavior. They also started applying genetic tools to define cell types and circuits in the macaque and marmoset monkeys. I decided to join the lab after an 8-month career break due to maternity. I am thoroughly excited to now expand my doctoral work to a novel primate system and context. Our overlapping interests combined with my deep knowledge in development of behaviors in experimental contexts makes this an ideal pairing of time, place, people and focus.

1. Kunwar PS, Zelikowsky M, Remedios R, Cai H, Yilmaz M, Meister M, Anderson DJ. Ventromedial hypothalamic neurons control a defensive emotion state. *Elife*. 2015 Mar 6;4PubMed PMID: [25748136](#); PubMed Central PMCID: [PMC4379496](#).
2. Yilmaz M, Meister M. Rapid innate defensive responses of mice to looming visual stimuli. *Curr Biol*. 2013 Oct 21;23(20):2011-5. PubMed PMID: [24120636](#); PubMed Central PMCID: [PMC3809337](#).

B. Positions and Honors

Positions and Employment

2008 - 2009 Life Sciences Research Assistant, Stanford University, Stanford , CA
2016 - Postdoctoral Fellow, Stanford University, Stanford , CA

Other Experience and Professional Memberships

Honors

2009 Herchel Smith Graduate Fellowship, Herchel Smith Fund
2009 Peirce Fellowship, Harvard University

C. Contribution to Science

1. I discovered that mice rapidly respond to the visual display of an overhead dark expanding object by either hiding or freezing in place (Yilmaz and Meister, 2013). This key discovery paves the way for future studies aiming to understand behaviors of mammals in face of threat. In addition it is instrumental for studies of the visual system that aim to identify neural elements detecting behaviorally relevant features. Indeed in recent years it was cited by many relevant studies including our own collaboration (Kunwar et al.,2015). It was featured on Caltech news (<http://www.caltech.edu/content/look-out-above-experiment-explores-innate-visual-behavior-mice>).
- a. Kunwar PS, Zelikowsky M, Remedios R, Cai H, Yilmaz M, Meister M, Anderson DJ. Ventromedial hypothalamic neurons control a defensive emotion state. Elife. 2015 Mar 6;4PubMed PMID: [25748136](https://pubmed.ncbi.nlm.nih.gov/25748136/); PubMed Central PMCID: [PMC4379496](https://pubmed.ncbi.nlm.nih.gov/PMC4379496/).
- b. Yilmaz M, Meister M. Rapid innate defensive responses of mice to looming visual stimuli. Curr Biol. 2013 Oct 21;23(20):2011-5. PubMed PMID: [24120636](https://pubmed.ncbi.nlm.nih.gov/24120636/); PubMed Central PMCID: [PMC3809337](https://pubmed.ncbi.nlm.nih.gov/PMC3809337/).

D. Additional Information: Research Support and/or Scholastic Performance