

## Takeshi Morita, Ph.D.

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### EDUCATION

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**University of California, Berkeley** August 2016  
Ph.D., Molecular and Cell Biology  
Thesis: "Genetic variation as a tool for identifying novel transducers of itch"

**University of California, San Diego** September 2008  
M.S., Biology  
Thesis: "Function and acuity of the rat vibrissa system during texture discrimination"

**University of California, San Diego** December 2006  
B.S., Animal Physiology and Neuroscience

### SCIENTIFIC TRAINING

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**Postdoctoral Fellow, The Rockefeller University/Howard Hughes Medical Institute** 2016 – Present  
Laboratory of Neurogenetics and Behavior  
*Advisor:* Leslie B. Vosshall, Ph.D.

- Discovered a novel mechanism of sensory compensation that mosquitoes use to maintain their drive to find humans
- Identified genes and neurons that are required for mosquito human-seeking behavior
- Developed genetic tools to turn the mosquito into a model organism for disease vector biology

**Ph.D. Student, University of California, Berkeley** 2010 – 2016  
Department of Molecular and Cell Biology  
*Advisors:* Diana M. Bautista, Ph.D., and Rachel B. Brem, Ph.D.

- Discovered that serotonin receptor *Htr7* mediates acute and chronic itch
- Showed that natural genetic variation underlies susceptibility to the development of chronic itch
- Developed an atopic dermatitis mouse model for studying chronic itch and skin lesions

**Staff Research Associate, University of California, Berkeley** 2009 – 2010  
Department of Molecular and Cell Biology  
*Advisor:* Diana M. Bautista, Ph.D.

- Helped Identify *Cnga2* as a candidate modulator in mammalian touch sensation
- Developed methods to study the star-nosed mole touch and pain sensory systems
- Characterized the thermosensitive properties of the mammoth cold-sensitive ion channels

**Master's Student, University of California, San Diego** 2007 – 2008  
Division of Biological Sciences  
*Advisor:* Daniel E. Feldman, Ph.D.

- Discovered that rats use multiple behavioral strategies to discriminate fine texture differences
- Developed an automated behavior apparatus to train rats to discriminate texture differences

**Undergraduate Research Assistant, University of California, San Diego** 2006 – 2007  
Division of Biological Sciences  
*Advisor:* Daniel E. Feldman, Ph.D.

- Developed behavioral strategies to train rats to discriminate textures based on human psychophysics

## FELLOWSHIPS AND AWARDS

- **Japan Society for the Promotion of Science Overseas Research Fellowship** 2017 – 2019  
Postdoctoral fellowship
- **Harvey L. Karp Discovery Award** 2016 – 2017  
Postdoctoral fellowship
- **The Alan J. Bearden Award** 2016  
Annual award for outstanding Ph.D. thesis in Neuroscience and Biophysics
- **Berkeley Graduate Division Conference Travel Grant** 2015  
Selected for conference attendance
- **8th World Congress of Itch Travel Award** 2015  
Selected based on research abstract

## PUBLICATIONS

(#Corresponding author, \*equal contribution)

- 13) **Morita T<sup>#</sup>**, Lyn NG, von Heynitz RK, Goldman OV, Sorrells TR, DeGennaro M, Matthews BJ, Hourizzevi L, Vosshall LB<sup>#</sup>  
Cross-modal sensory compensation increases mosquito attraction to humans  
Preprint: *bioRxiv* (2023), doi: <https://doi.org/10.1101/2023.10.10.561721>
- 12) Yin C, **Morita T**, Parrish JZ  
A cell atlas of the larval *Aedes aegypti* ventral nerve cord  
Preprint: *bioRxiv* (2023), doi: <https://doi.org/10.1101/2023.09.08.556941>  
*Neural Development* (2024) Jan 31;19(1):2. doi: 10.1186/s13064-023-00178-8, (PMID: 38297398)
- 11) Yoshino J\*, Mali SS\*, Williams CR\*, **Morita T**, Emerson C, Arp C, Miller S, Yin C, The L, Hemmi C, Motoyoshi M, Ishii K, Emoto K<sup>#</sup>, Bautista DM<sup>#</sup>, Parrish JZ<sup>#</sup>  
*Drosophila* epidermal cells are intrinsically mechanosensitive and drive nociceptive behavioral outputs  
Preprint: *bioRxiv* (2022), doi: <https://doi.org/10.1101/2022.10.07.511265>
- 10) De Obaldia ME<sup>#</sup>, **Morita T**, Dedmon LC, Boehmler DJ, Jiang CS, Zeledon EV, Cross JR, Vosshall LB<sup>#</sup>  
Differential mosquito attraction to humans is associated with skin-derived carboxylic acid levels  
Preprint: *bioRxiv* (2022), doi: <https://doi.org/10.1101/2022.01.05.475088>  
*Cell* (2022) Oct 27; 185(22): 4099-4116, (PMID: 36261039)
- 9) Herre M\*, Goldman OV\*, Lu TC, Caballero-Vidal G, Qi Y, Gilbert ZN, Gong Z, **Morita T**, Rahiel S, Ghaninia M, Ignell R, Matthews BJ, Li H, Vosshall LB, Younger MA<sup>\*\*</sup>  
Non-canonical odor coding in the mosquito  
Preprint: *bioRxiv* (2022), doi: <https://doi.org/10.1101/2020.11.07.368720>  
*Cell* (2022) Aug 18; 185(17):3104-3123, (PMID: 35985288)
- 8) Basrur NS<sup>#</sup>, De Obaldia ME, **Morita T**, Herre M, von Heynitz RK, Tsiotay YN, Vosshall LB<sup>#</sup>  
*fruitless* mutant male mosquitoes gain attraction to human odor  
Preprint: *bioRxiv* (2020), doi: <https://doi.org/10.1101/2020.09.04.282434>  
*eLife* (2020) Dec 7;9:e63982. doi: 10.7554/eLife.63982, (PMID: 33284111)
- 7) Hill RZ, **Morita T**, Brem RB, Bautista DM  
S1PR3 mediates inflammatory pain and itch via distinct TRP channel-dependent pathways  
Preprint: *bioRxiv* (2017), doi: <https://doi.org/10.1101/235614>  
*J Neurosci* (2018), 38(36):7833-7843, (PMID: 30082422)
- 6) Hill RZ, Hoffman B, **Morita T**, Campos SM, Lumpkin EA, Brem RB, Bautista DM  
The signaling lipid sphingosine 1-phosphate regulates mechanical pain  
Preprint: *bioRxiv* (2017), doi: <http://dx.doi.org/10.1101/236778>  
*eLife* (2018), 7:e33285, (PMID: 29561262)

- 5) **Morita T\***, McClain SP\*, Batia LM, Pellegrino M, Wilson SR, Kienzler KA, Lyman K, Olsen ASB, Wong JF, Stucky CL, Brem RB#, Bautista DM#  
HTR7 mediates serotonergic acute and chronic itch  
*Neuron* (2015), 87(1): 124–138, (PMID: 26074006)
- 4) Schwarzer C, Fu Z, **Morita T**, Whitt AG, Neely AM, Li C, Machen TE  
Paraoxonase 2 serves a proapoptotic function in mouse and human cells in response to the *Pseudomonas aeruginosa* quorum-sensing molecule N-(3-Oxododecanoyl)-homoserine lactone  
*J Biol Chem* (2015), 290(11): 7247-58, (PMID: 25627690)
- 3) Wilson SR, Nelson AM, Batia L, **Morita T**, Estandian D, Owens DM, Lumpkin EA, Bautista DM  
The ion channel TRPA1 is required for chronic itch  
*J Neurosci* (2013), 33(22): 9283-94, (PMID: 23719797)
- 2) Gerhold KA\*, Pellegrino M\*, Tsunozaki M, **Morita T**, Leitch DB, Tsuruda PR, Brem RB, Catania KC, Bautista DM  
The star-nosed mole reveals clues to the molecular basis of mammalian touch  
*PLoS One* (2013), 8(1):e55001, (PMID: 23383028)
- 1) **Morita T\***, Kang H\*, Wolfe JH, Jadhav SP, Feldman DE  
Psychometric curve and behavioral strategies for whisker-based texture discrimination in rats  
*PLoS One* (2011), 6(6): e20437, (PMID: 21673811)

## TEACHING EXPERIENCE

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- **Scientific Course Consultant (Faculty), Marine Biological Laboratory** Summers 2021, 2022  
*Neurobiology: Mechanisms & Advanced Approaches*
- **Teaching Assistant, Marine Biological Laboratory** Summers 2017, 2018, 2019  
*Neurobiology: Mechanisms & Advanced Approaches*
- **Instructor, University of California, Berkeley** Summer 2013  
*Neuro Bootcamp - Helen Wills Neuroscience Institute*
- **Graduate Student Instructor, University of California, Berkeley** Spring 2013  
*Cell Biology and Physiology Laboratory*
- **Graduate Student Instructor, University of California, Berkeley** Fall 2011  
*Introduction to Human Physiology*
- **Teaching Assistant, University of California, San Diego** Summer 2007  
*Mammalian Physiology*
- **Teaching Assistant, University of California, San Diego** Spring 2007  
*Laboratory in Microbiology*

## MENTORSHIP

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- Sheanel Gardner, *The Rockefeller University, Rotation Student* Fall 2023
- Omar Koita, *Oregon Health and Science University, MBL Neurobiology Student* Summer 2022
- Divyansh Mittal, *Indian Institute of Science, MBL Neurobiology Student* Summer 2022
- Edenia Menezes, *The Nathan S. Kline Institute, MBL Neurobiology Student* Summer 2022
- Veronica Pagowski, *Stanford University, MBL Neurobiology Student* Summer 2022
- Najva Akbari, *Stanford University, MBL Neurobiology Student* Summer 2022
- Mara Muller, *Max Planck Institute for Brain Research, MBL Neurobiology Student* Summer 2022
- Adriana Rosas, *The Rockefeller University, MBL Neurobiology Student* Summer 2022
- Silvia Vicenzi, *University of California San Diego, MBL Neurobiology Student* Summer 2022
- Zhongyan Gong, *UC Berkeley, MBL Neurobiology Teaching Assistant* 2021 – 2022
- Ruohan Zhong, *Stowers Institute for Medical Research, MBL Neurobiology Student* Summer 2021
- Flavie Bidel, *University of Minnesota, MBL Neurobiology Student* Summer 2021
- Brittany Brooks, *Howard University, MBL Neurobiology Student* Summer 2021

- Sarah Denha, *Oakland University, MBL Neurobiology Student* Summer 2021
- Jiro Yoshino, *University of Washington, MBL Neurobiology Teaching Assistant* Summer 2021
- Nia Lyn, *The Rockefeller University, Research Assistant* 2019 – 2021
- Koral Goltseker, *Columbia University, MBL Neurobiology Student* Summer 2019
- Christine Prater, *Texas Tech University, MBL Neurobiology Student* Summer 2019
- Shannan McClain, *UC Berkeley, Research Assistant* 2013 – 2015
- Justin Wong, *UC Berkeley, Undergraduate Student* 2013 – 2015
- Arisdelyz Villanueva, *CSU-Dominguez Hills, NSF REU Student* Summer 2014
- Joseph Meeuwssen, *Oregon Institute of Technology, NSF REU Student* Summer 2013
- Diya Das, *UC Berkeley, Rotation Student* Spring 2013

## PRESENTATIONS

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### Talks

- 8) Neuronal and behavioral basis of mosquito sensory compensation 2023  
*Kavli Neural Systems Institute Seminar, New York, NY*
- 7) Neuronal and behavioral basis of mosquito sensory compensation 2022  
*Invited Seminar, Marine Biological Laboratory, Woods Hole, MA*
- 6) Sensory compensation and plasticity of *Aedes aegypti* mosquito host-seeking behavior 2021  
*Invited Seminar, Marine Biological Laboratory, Woods Hole, MA*
- 5) HTR7 mediates serotonergic acute and chronic itch 2015  
*Invited Seminar, National Institute of Physiological Sciences, Okazaki, Japan*
- 4) HTR7 mediates serotonergic acute and chronic itch 2015  
*8th World Congress on Itch, Nara, Japan*
- 3) The serotonin receptor HTR7 mediates chronic itch 2015  
*UC Berkeley Molecular and Cell Biology Departmental Retreat, Lake Tahoe, CA*
- 2) Genetic mapping of novel molecular players in itch 2012  
*UC Berkeley Neuroscience Departmental Retreat, Lake Tahoe, CA*
- 1) Molecular cellular and genetic mechanisms underlying itch 2011  
*UC Berkeley Molecular and Cell Biology Departmental Retreat, Lake Tahoe, CA*

### Posters

- 4) Sensory compensation and plasticity of *Aedes aegypti* mosquito host-seeking behavior 2023  
*Howard Hughes Medical Institute Investigator Meeting, Chevy Chase, MD*
- 3) Using natural variation to identify novel molecular players in itch 2014  
*The Neurobiology of Pain and Itch, San Francisco, CA*
- 2) Genetic mapping of novel molecular players in itch 2013  
*UC Berkeley Neuroscience Departmental Retreat, Lake Tahoe, CA*
- 1) Macrovibrissae are sufficient to perform fine texture discrimination in rats 2008  
*Society of Neuroscience Annual Meeting, Washington, DC*

## OUTREACH

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- **Summer Neuroscience Program** 2023  
*The Rockefeller University – 20 students, led a pair of students for research project*
  - Provided mentorship to a team of local high school students for developing research projects
- **Brain Tumor Survivor Care Program 360°** 2021 – 2022  
*Toho University Ohashi Medical Center/UCSF Brain Tumor Center – more than 50 active participants*
  - Helped launch the collaboration between Toho University Ohashi Medical Center and UCSF Brain Tumor Center to establish the first brain tumor survivor's program in Japan
  - Translated UCSF's patient and caregiver manuals into Japanese
- **Monthly community clean-up, Science and Communication and Media group** 2019 – 2020  
*The Rockefeller University – 10-15 children/parent groups per event*
  - Organized events to clean up the neighborhood and raise pollution awareness aimed at children

- **Zero-waste Halloween event, Science and Communication and Media Group** 2019  
*The Rockefeller University – 50 children/parent groups*
  - Volunteered to raise awareness of plastic pollution for local children
- **Research Experience for Undergraduates Summer Mentorship Program** Summers 2013, 2014  
*National Science Foundation – 15 students, directly mentored one student for a project each year*
  - Mentored undergraduate students from under-resourced universities to conduct research projects

#### PROFESSIONAL DEVELOPMENT

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- **Academic Faculty Job Search Boot Camp** Summer 2023  
*The Rockefeller University*
- **Managing Science & Scientists Workshop** Summer 2023  
*The Rockefeller University*
- **The Hurford Science Diplomacy Initiative: Faces of Science Diplomacy** Winter 2020  
*The Rockefeller University*
- **Launching Your Undergraduate Science Teaching Career Course** Fall 2019  
*Tri-I: Memorial Sloan Kettering/The Rockefeller University/Weill Cornell Medicine*
- **Management Training Series: Coaching for Potential** 2019  
*The Rockefeller University*

#### REFERENCES

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**Leslie B. Vosshall, Ph.D.**

Vice President and Chief Scientific Officer, Howard Hughes Medical Institute  
Robin Chemers Neustein Professor, Laboratory of Neurogenetics and Behavior  
The Rockefeller University  
Phone: 212-327-7236  
leslie@rockefeller.edu

**Diana M. Bautista, Ph.D.**

Investigator, Howard Hughes Medical Institute  
Professor of Cell Biology, Development and Physiology  
Department of Molecular & Cell Biology  
Helen Wills Neuroscience Institute  
University of California, Berkeley  
Phone: 510-642-1794  
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**Jay Z. Parrish, Ph.D.**

Investigator, Weill Neurohub  
Professor, Department of Biology  
University of Washington  
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**Rachel B. Brem, Ph.D.**

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University of California, Berkeley  
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