

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors in the order listed on Form Page 2. Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME Leslie B. Vosshall, Ph.D.		POSITION TITLE Investigator, Howard Hughes Medical Institute Robin Chemers Neustein Professor	
eRA COMMONS USER NAME (credential, e.g., agency login) LESLIEVOSSHALL			
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)	MM/YY	FIELD OF STUDY
Columbia College, Columbia University	A.B.	06/87	Biochemistry
HHMI—The Rockefeller University	Ph.D.	06/93	Molecular Genetics
HHMI—Columbia University	Postdoc	1993-1997	Molecular Neurobiology

A. Personal Statement

I am a molecular neurobiologist with 30 years of experience as a biomedical researcher and 12 years of experience running my own independent laboratory. The main focus of my lab is to understand the genetic basis of behavior, with particular emphasis on how organisms perceive and respond to external sensory stimuli and how these responses are modulated by the internal physiological state of the animal. Our early work concerned olfactory perception and we discovered two large families of insect chemosensory receptors (ORs and IRs) and we have described general principles regarding their function, expression and the connectivity of the sensory neurons that express them to primary processing centers in the brain. We also investigate the molecular mechanisms underlying a diverse array of stereotyped insect behaviors – including the host-seeking behavior of mosquitoes and feeding behavior of *Drosophila*. We use a multi-disciplinary approach to tackle problems from the level of the sensory receptor to the behavior of the animal.

B. Positions and Honors

Positions and Employment

2010-Present	Robin Chemers Neustein Professor, and Head of the Laboratory of Neurogenetics and Behavior, The Rockefeller University, New York, NY
2008-Present	Investigator, Howard Hughes Medical Institute
2006-2010	Chemers Family Associate Professor and Head of the Laboratory of Neurogenetics and Behavior, The Rockefeller University, New York, NY
2005-2007	Faculty, Neural Systems and Behavior Course, Marine Biological Laboratory, Woods Hole, MA
2003-2006	Chemers Family Assistant Professor and Head of the Laboratory of Neurogenetics and Behavior, The Rockefeller University, New York, NY
2000-2003	Annenberg Assistant Professor and Head of the Laboratory of Neurogenetics and Behavior, The Rockefeller University, New York, NY
1997-2000	Associate Research Scientist, Center for Neurobiology and Behavior, Howard Hughes Medical Institute, Columbia University, New York, NY. In the laboratory of Dr. Richard Axel
1994	Instructor, Neurobiology Course, Marine Biological Laboratory, Woods Hole, MA

Other Experience and Memberships

a. Editorial

2012-Present	Member, PLoS Biology Editorial Board
2008-Present	Associate Editor, Frontiers in Neural Circuits
2007-Present	Member, Chemical Senses Editorial Board

2007-2009 Member, PLoS ONE Editorial Board
 2007-Present Associate Editor, Journal of Neuroscience
 2006-2010 Reviewing Editor, HFSP Journal
 2005-Present Associate Editor, The FASEB Journal
 2005-Present Member, Current Biology Editorial Board

b. Grant and Peer Review

2010-Present Board of Scientific Counselors, NIH, NIDCR
 2008-Present Member of the Group Leader Selection Committee, HHMI-Janelia Farm Research Campus
 2008-Present Jury Member for the Vilcek Prize for Creative Promise
 2008-Present Member, McKnight Scholar Award Selection Committee
 2008-Present Member, Program Committee of the Alfred P. Sloan Research Fellowships in Neuroscience
 2008-Present External Reviewer, Radcliffe Institute Fellows Program
 2008-2009 Member, NINDS Basic Module Advisory Panel
 2007-Present External Review Committee Member, Max Planck Institute of Chemical Ecology
 2007-2008 TMF/Patterson Trust Fellowship Program in Brain Circuitry External Reviewer
 2007 MRC Young Investigator Grant External Reviewer
 2006 HHMI International Research Scholar Program Panelist
 2006-2009 Beckman Young Investigator Program Panelist
 2006 German Volkswagen Stiftung External Reviewer
 2002-Present NIH Grant Review: Ad Hoc Member, NIH CSR review panels (NIDCD ZDC1 SRB-S, NIDCD ZDC1 SRY-Y, NIDCD CDRC, NIH/CSR SCS, NIH SCS CBSS)
 2002-2007 NSF Grant Review: MCB, IBN, and CAREER Award Reviewer
 2002-Present Norwegian Technology Foundation External Reviewer
 2000-Present Manuscript review: Cell, Neuron, Nature, Science, Nature Neuroscience, Current Biology, Journal of Neuroscience, PNAS, Genetics, Chemical Senses, Structure, European Journal of Neuroscience, Journal of Comparative Neurology, Journal of Experimental Biology

c. Conference and Association Service

2010 Organizer (with Kazushige Touhara), 2010 Janelia Farm Research Conference: Form and Function of the Olfactory System
 2009 Organizer (with Peter Mombaerts), 2009 Keystone Meeting. "Chemical Senses: Receptors & Circuits"
 2007 Co-organizer (with Peter Mombaerts), 2007 Keystone Meeting. "Chemical Senses: From Receptors to Perception"
 2006 Association for Chemoreception Sciences (AChemS) Election Committee Member
 2004, 2005 Chemosensory Receptors Symposium Session Co-Chair, AChemS
 2003, 2005 Sensory Systems Session Chair, Cold Spring Harbor Neurobiology of *Drosophila* meeting
 2002 Olfaction Session Chair, Society for Neuroscience meeting
 2001, 2006, 2008 Program Committee Member, AChemS

d. Consulting

2011-Present Member, Scientific Advisory Board, International Flavors and Fragrances
 2000-2004 Member, Scientific Advisory Board, Sentigen Biosciences
 1999 Participant, *Drosophila* Genome Annotation Jamboree, Celera Genomics

Honors

2013 Forbes Lecturer, Marine Biological Laboratory
 2012 Joshua Lederberg Lecture, Marine Biological Laboratory
 2011 Gill Center Young Investigator Award
 2010 Dart/NYU Biotechnology Alumnae Achievement Award
 2009 Lawrence C. Katz Prize, Duke University
 2008 The International Society of Chemical Ecology Silverstein-Simeone Lecture Award
 2007 Winner, Blavatnik Awards for Young Scientists from the New York Academy of Sciences

2005	New York City Mayor's Young Investigator Award for Excellence in Science and Technology
2005	Rockefeller University Teaching Award
2002	Presidential Early Career Award for Scientists and Engineers (PECASE)
2002	John Merck Fund Award
2001	Beckman Young Investigator Award
2001	National Science Foundation CAREER Award
2001	McKnight Scholar Award
1987	John Jay Scholar, Columbia College of Columbia University

C. Selected Peer-reviewed Publications

NIH encourages applicants to limit the list of selected peer-reviewed publications or manuscripts in press to no more than 15. Do not include manuscripts submitted or in preparation. The individual may choose to include selected publications based on recency, importance to the field, and/or relevance to the proposed research.

Most relevant to the current application

1. Larsson MC, Al Domingos, WD Jones, ME Chiappe, H Amrein, and **LB Vosshall**. 2004. *Or83b* encodes a broadly expressed odorant receptor essential for *Drosophila* olfaction. Neuron 43:703-714. PMID: 15339651
2. Keller A and **LB Vosshall**. 2007. Influence of odorant receptor repertoire on odor perception in humans and fruit flies. PNAS 104:5614-5619. PMID: 17372215
3. Sachse, S, Rueckert, E, Keller, A, Okada, R, Tanaka, NK, Ito, K and **LB Vosshall**. 2007. Activity-dependent plasticity in an olfactory circuit. Neuron 56:838-850. PMID: 18054860
4. Farhadian SF, M Suárez-Fariñas, CE Cho, M Pellegrino, **LB Vosshall**. 2011. Post-fasting olfactory, transcriptional, and feeding responses in *Drosophila*. Physiol. Behav. 105:544-553.
5. DeGennaro M, CS. McBride, L Seeholzer, T Nakagawa, C Goldman, N Jasinskiene, AA. James, **LB Vosshall**. 2012. Disruption of mosquito preference for humans by targeted mutagenesis of the orco olfactory co-receptor. Science, submitted.

Additional recent publications of importance to the field (in chronological order)

1. Keller, A and **LB Vosshall**. 2004. A Psychophysical Test of the Vibration Theory of Olfaction. Nat. Neurosci. 7:337-338. PMID: 15034588
2. Fishilevich E, and **LB Vosshall**. 2005. Genetic and functional subdivision of the *Drosophila* antennal lobe. Curr. Biol. 15:1548-1553. PMID: 16139209
3. Fishilevich E., Al Domingos, K Asahina, F Naef, **LB Vosshall**, and M Louis. 2005. Chemotaxis behavior mediated by single larval olfactory neurons in *Drosophila*. Curr. Biol. 15:2089-2096. PMID: 16332533
4. Benton R, S Sachse, SW Michnick, and **LB Vosshall**. 2006. Atypical membrane topology and heteromeric function of *Drosophila* odorant receptors *in vivo*. PLoS Biol. 4:e20. PMID: 16402857
5. Jones, WD, P. Cayirlioglu, I Grunwald Kadow, and **LB Vosshall**. 2007. Two chemosensory receptors together mediate carbon dioxide detection in *Drosophila*. Nature 445:86-90. PMID: 17167414
6. Benton, R, KS Vannice, and **LB Vosshall**. 2007. An essential role for a CD36-related receptor in pheromone detection in *Drosophila*. Nature 450:289-293. PMID: 17943085
7. Keller A*, H Zhuang*, Q Chi, **LB Vosshall**, and H Matsunami. 2007. Genetic variation in a human odorant receptor alters odour perception. Nature 449:468-472. *equal contribution PMID: 17873857
8. Louis, M, Huber, T, Benton, R, Sakmar, TP, and **LB Vosshall**. 2007. Bilateral olfactory sensory input enhances chemotaxis behavior. Nat. Neurosci. 11:187-199. PMID: 18157126
9. Ditzen, M., M Pellegrino, and **LB Vosshall**. 2008. Insect odorant receptors are molecular targets of the insect repellent DEET. Science 319:1838-1842. PMID: 18339904
10. Sato, K., M Pellegrino, T Nakagawa, T Nakagawa, **LB Vosshall**, and K Touhara. 2008. Insect olfactory receptors are heteromeric ligand-gated ion channels. Nature 452:1002-1006. PMID: 18408712

11. Benton, R, KS Vannice, C Gomez-Diaz, and **LB Vosshall**. 2009. Variant ionotropic glutamate receptors as chemosensory receptors in *Drosophila*. Cell 136:149-162. PMID: 19135896
12. Asahina, K, M Louis, S Piccinotti, and **LB Vosshall**. 2009. A circuit supporting concentration-invariant odor perception in *Drosophila*. J. Biol. 8:9. PMID: 19171076, PMCID:2656214
13. Pellegrino, M, N Steinbach, MC Stensmyr, BS Hansson, and **LB Vosshall**. 2011. A natural polymorphism alters odour and DEET sensitivity in an insect odorant receptor. Nature 478:511-4

D. Research Support

List both selected ongoing and completed research projects for the past three years (Federal or non-Federally-supported). *Begin with the projects that are most relevant to the research proposed in the application.* Briefly indicate the overall goals of the projects and responsibilities of the key person identified on the Biographical Sketch. Do not include number of person months or direct costs.

Ongoing

- [1] HHMI Investigator Award (PI: Vosshall) 7/1/08-8/31/13
Title: Modulation of Behavior by Internal Physiological State
Goal: To understand how internal physiological states alter behavior
- [2] Grand Challenge 8, #786 (PI: Axel, co-PI: Vosshall) 9/15/05-09/14/12
FNIH CU08-7037/Bill and Melinda Gates Foundation
Title: Molecular Approaches to Alter Olfactory-Driven Behaviors of Insect Disease Vectors
Goal: To develop novel insect repellents that target the olfactory system of vector insects
- [3] 5 R01 DC008600-05 (PI: Vosshall) 12/04/06-11/30/11
NIH/NIDCD
Title: Molecular biology of the odorant receptors
Goal: To investigate the molecular structure and function of the insect odorant receptor complex
- [4] Vectorbase DBP Subcontract (PI: Vosshall) 10/1/10-9/30/12
NIH/NIAID (DBP)
Title: Comparative Neurotranscriptome of *Aedes aegypti*
Goal: To use RNAseq techniques with Illumina technology to decode the transcriptome of neural tissues of the yellow fever mosquito under different regimes of host-seeking behavior
- [5] 2 UL1 RR024143-06 (Subaward PI: Vosshall) 10/5/11-6/30/12
NIH/NCRR/R (Pilot Award)
Title: Isolation of Cues that Drive Mosquito Preference for Certain Human Hosts
Goal: To collect data on interindividual variation in attractiveness of human subjects to mosquitoes, by behavioral phenotyping, collection of blood samples, and skin microbiome samples

Completed

- [1] Grant: 5R01 DC006711-05 (PI: Vosshall) 12/2/04-11/30/10
Funding Agency: NIH/NIDCD Title: Genetic Analysis of Olfactory Coding in *Drosophila*
Goal: To study odor coding in the *Drosophila* Larva Using Molecular Genetic Approaches
- [2] Grant: Klarman Family Foundation Grants Program in Eating Disorders Research
(PI: Vosshall) 6/1/08-2/28/11
Funding Agency: The Klarman Family Foundation
Title: Identification of Novel Genes and Circuits in an Animal Model of Binge Eating Disorder
Goal: To study feeding behavior and its regulation by genetic and chemical disruption in *Drosophila*.