CURRICULUM VITAE

Laurence J. Zwiebel

Current Position:

Cornelius Vanderbilt Chair of Biological Sciences
Professor of Biological Sciences/Pharmacology
Vanderbilt University
Nashville, TN 37235 USA

University Affiliations:

Vanderbilt Brain Institute; Programs in Developmental Biology and Human Genetics Research, Institutes for Chemical Biology and Global Health, Neuroscience Graduate and Undergraduate Programs.

WebPage

http://lab.vanderbilt.edu/zwiebel-lab/

Nationality:

United States of America

Education/Training:

State University of New York at Stony Brook
Stony Brook, New York
B.S., 1981 (Biochemistry)
Drs. Martin Freundlich/Masayori Inouye, Mentors

University of Michigan
Ann Arbor, Michigan
M.S., 1983 (Biology)
Dr. Gordon P. Moore, Mentor
Master's Thesis: *Evolution of Single-copy DNA and the Alcohol Dehydrogenase Gene in Seven Drosophilids.*

Brandeis University
Waltham, Massachusetts.
Ph.D., 1991 (Molecular Biology)
Drs. Michael Rosbash and J.C, Hall, Mentors
Ph.D. Thesis: *The period gene protein of Drosophila melanogaster: A Biochemical Analysis with Implications for Biological Rhythms.*

Harvard University
Cambridge, Massachusetts.
Postdoctoral Fellow, 1992-1994
Dr. Fotis C. Kafatos, Mentor

European Molecular Biology Laboratory
Heidelberg, Germany
Postdoctoral Fellow, 1994-1997
Dr. Fotis C. Kafatos, Mentor

Marine Biology Laboratory
Woods Hole, Massachusetts
1982, Embryology

European Molecular Biology Laboratory
Heidelberg, Germany
1992, Microinjection & Transformation Course

Academic Appointments:

2012-: Cornelius Vanderbilt Chair of Biological Sciences

2006-: Professor (*with tenure*)
Department of Biological Sciences
Department of Pharmacology (*since 2008*)
Programs in Developmental Biology and Genetics
Vanderbilt Brain Institute, Institutes for Chemical Biology and Global Health
Vanderbilt University/Vanderbilt University Medical Center
Nashville, TN, 37235 USA

2004-2005: Associate Professor (*with tenure*)
Department of Biological Sciences
Programs in Developmental Biology and Genetics
Centers for Chemical Biology and Molecular Neuroscience
Vanderbilt University/Vanderbilt University Medical Center
Nashville, TN, 37235 USA.

1998-2003: Assistant Professor
Departments of Biology/Molecular Biology/Biological Sciences
Program in Developmental Biology and Center for Molecular Neuroscience.
Vanderbilt University/Vanderbilt University Medical Center
Nashville, TN, 37235 USA.

1992-1997: Postdoctoral Fellow (Dr. F.C. Kafatos, mentor).
Department of Cellular and Developmental Biology
Harvard University, Cambridge, MA, USA
European Molecular Biology Laboratory, Heidelberg, GERMANY.

1992-1994: Visiting Fellow
Institute of Molecular Biology and Biotechnology
Heraklion, Crete, GREECE.

1986-1992: Predoctoral Student (Drs. J. Hall/M. Rosbash, mentors).
Department of Biology and The Howard Hughes Medical Institute
Brandeis University
Waltham, MA, USA.

1981-1983: Master's Degree Student (Dr. G.P. Moore, mentor).
Department of Biological Sciences.
The University of Michigan, Ann Arbor, MI, USA.

1978-1981: Undergraduate Research Assistant (Drs. M. Freundlich/M. Inouye, mentors).
Department of Biochemistry
State University of New York at Stony Brook
Stony Brook, NY, USA.

Undergraduate, Graduate, Postdoctoral Honors/Grants/Fellowships:

Regents Scholarship of New York (1976-1980)
NIH Traineeship, University of Michigan (1981-2)
Rackham Grants, University of Michigan (1982-3)
NIMH Predoctoral Fellowship, (1989-1991)
NSF-NATO Postdoctoral Fellowship (1992-93)

Currently Active Extramural Grant Support:

National Institutes of Health (NIGMS) R01-GM128336-05: *"*Molecular Neurogenetics of Olfactory Driven Aggression and Social Hierarchy in a Model Insect System." (L.J. Zwiebel, Principal Investigator). July 2018 through May 2024. Total funds: $1,569,520.

National Institutes of Health (NIAID) R01-AI173025-01: *"*Characterization of Ionotropic Receptors in Mating and Blood Feeding in Anopheles Mosquitoes." (L.J. Zwiebel, Principal Investigator). June 2023-May 2028. Total funds: $2,527,598

Professional Societies:

Association for Chemoreception Sciences.
American Association for the Advancement of Science.
American Mosquito Control Association.
EMBL Alumni Society.
Society for Vector Ecology

Teaching:

Vanderbilt University Classroom Teaching (since 1998):

Biological Sciences 110A/1510A: Introduction to the Biological Sciences. This is the primary introductory survey course for both majors and non-majors in the biological and or life sciences. Topics cover the full spectrum of the field with an eye towards preparing the students for future specialization courses. Typically, the total enrollment ranges between 180 and 220 students *Co-Instructor with Professor Kendal Broadie, 2008-present.*

Biological Sciences 3890/5890: Special Topics in Biological Sciences: How Ignorance, Failure and Critique Drives Science. This seminar/discussion course examines the scientific approach to ignorance, failure and critique though readings, discussions, and visits from working scientists who discuss the state of ignorance in their field (and in their individual

laboratories) as well as their approaches to positively incorporating failure and constructive critique in science education and training. *Spring 2023.*

Biological Sciences 3861: Coordinator, Directed Undergraduate Research in the Biological Sciences. The broad objectives of this gateway course for undergraduate research is to provide an opportunity to participate in original laboratory research, including problem definition, experimental design, experimental performance and data interpretation. This course aims to provide experience in all areas, culminating in a written report in the form of a scientific journal article. Research is performed under direct supervision of a BioSci faculty mentor. *Spring 2022.*

Biological Sciences 6320: Graduate Seminar in Biological Sciences. This is a required course for all first and second year BioSci graduate students that is designed to explore several aspects of the scientific endeavor most importantly the preparation of successful research proposals. In addition, the class explored how ignorance, paradigm shifts and critique impact the scientific enterprise, the role of innovation, entrepreneurialism, and intellectual property in science careers *Spring 2022.*

Biological Sciences 3256: Molecular Neuroscience. This is an upper-level neuroscience course with a focus on the molecular components of neuronal activity. Topics range from neuronal development and plasticity, synaptic transmission, sensory systems and learning/memory. Typically, the total enrollment ranges between 20 and 40 students *Co-Instructor with Professor Kendal Broadie, 2016-2020.*

Biological Sciences 275: Seminar in Vector Biology and Global Health. This course is directed towards upper-level undergraduates encompasses a wide-range of topics that explore the biology of disease vectors and their impact on global public health. Class sessions mix both didactic and interactive components (i.e. student presentations) and foster an examination of the current literature. Typically, the total enrollment ranges between 10 and 15 students. *2005-2015*.

Biological Sciences 201: Introduction to Cell Biology. This is a middle level course that, along with Genetics serves as an advanced entry to most of the higher-level courses for undergraduate majors. In addition to the 3 credit lectures Bio 201 included a one-credit laboratory component that has recently been independently listed as BioSci 202. Typically, the total enrollment ranges between 75 and 100 students. *Co-Instructor with Professor Todd Graham, 1998-2006*.

Biological Sciences 240: Developmental Biology. This course, co-listed in the graduate catalog as BioSci 340 serves as the advanced level course in Developmental Biology is also open to graduate students who had not had an entry level course in this area. Typically, the total enrollment ranges between 35 and 45 students. *Co-Instructor with Professors Lila Solnica-Krezel, 1998-2005 (or David Bader, Fall 2002)*.

Biology 280: Fundamentals of Signal Transduction. This seminar for upper-level undergraduates as well as graduate students was given my first semester at Vanderbilt University. Spring 1998.

Biology 110B: Introduction to Biological Sciences-*Frontiers in Biological Sciences,*

Guest Lecturer, 1999.

Neurobiology 299: Senior Seminar in Neuroscience-*Neural Basis of Behavior*,
Guest Lecturer, 2000, 2001.

Neurobiology 340: Systems and Integrative Neuroscience,
Guest Lecturer, 2004, 2005.

Neurobiology 345: Fundamentals of Neuroscience,
Guest Lecturer for a one-week segment (3 lectures), 2001-2010.

Neurobiology 346: Advanced Molecular Neuroscience,
Guest Lecturer for a one-week segment (3 lectures), 2006, 2007.

Neurobiology/Pharmacology 348: Contemporary Issues in Behavioral Neuroscience, Guest Lecturer (2 lectures) 2000.

Topics in International Medicine, VUMC 2nd Year Students
Guest Lecturer, 2004

Research Training (since 1998)

Undergraduate Research Trainees/Interns (**bold denotes co-author on publications**)

Clayton Ross 1998-1999, Currently: Sales Representative, Plansville, FL.
Richard Lin, 1999-2000, Currently: MD, PhD. New York.
Kimberly Safran, 1998-1999, Currently: Research Technician, University of Pittsburg, PA
Kimberly Stevens (Nicol), 2000-2001, Currently: DMD, Lexington, KY.
T. Justin Gillenwater, 2002, Currently: MD, Plastic Surgeon, California.
Tracey Sherertz, 2001-2003 (Honors), Currently: MD, Radiation Oncology Resident at Loyola University Chicago.
Gettha Hiremath, 2003.
Lori Grimes, 2003.
Brittany Guy, 2002-2005, (VUSRP) Currently: MPH student, Washington University, MO.
Jordan Knepper, 2003-2005 (Honors), Currently: MD, Neurosurgery Resident, University of Michigan.
Taha Jan, 2004-2007 (Honors, VUSRP), MD, Stanford. Currently: Otolaryngology Resident, Harvard University Medical School.
Daniella Buscariollo, 2005-2007 (Honors), MD, Vanderbilt University. Currently: Surgical Resident, Yale University Medical School.
Laura Chretin, 2006-2008 (Honors, VUSRP), Currently: Teach America.
Melissa Zhu, 2006-2008.
Catherine Hambelton, 2006-09, Currently: MD Southern Methodist Hospital, TX.
Patricia Smith, 2007-09. Currently: Teach America.
Colby Alexander Davis, 2008-09.
Winston Hale, 2010.
Sara Regina Skavroneck, 2010-11, Currently: MD student, UNC, Chapel Hill, NC
Fadi Emad Pulous, 2010-12, Currently: PhD Student, Emory University

Stephen L. Derryberry, 2011- 2013 (Honors, VUSRP), Currently, MD Student, Vanderbilt University Medical School.
Juan C. Malpartida, 2011-13 (Honors, VUSRP), Currently: MD student, UT-Memphis.
Nathan T. Day, 2012-13, Currently: Research Intern, UC San Francisco/Uganda.
Emily Specht, 2014-2015, Currently: Teacher, Brownsville Middle School, NY.
Alexandra Ruff, 2014-2016, (Honors), Currently: Director of Laboratory Operations, Biome Makers, San Francisco, CA.
Yuanchu (James) Yang, 2016-2017.
Kyu Young Park, 2016-2019
Mackenzie Barker, 2017-2019.
Maureen Ubani, 2019-2021
Isaac Bakis, 2019-2021
Nicholas Edwards, 2021-2022
Katrina Schwensen, 2021-2022
Enzo de Jong, 2022-
Ahmed Imami, 2022-
Leon Li, 2023-
Ilias Shin, 2023-

Graduate Students

Amy Nicole Fox, Department of Biological Sciences, Program in Developmental Biology, 1999-2002 (Ph.D. awarded December 2002). Thesis: "Molecular and Cellular Characterization of Odorant Receptors in *Anopheles gambiae*." Currently, Senior Research Scientist, Department of Neurobiology, University of Massachusetts Medical Center, Worcester, MA.

Catherine Elaine Merrill, Program in Neuroscience, 1999-2004. (Ph.D. awarded March 2004). Thesis: "Molecular and Cellular Characterization of Olfactory Arrestins in *Anopheles gambiae*." Currently, Postdoctoral Fellow, Northwestern University Medical School. Dr. Ravi Allada (mentor).

William B. Walker, Program in Neuroscience, Developmental Biology Training Grant, 2003-2008. (Ph.D. awarded March 2008). Thesis: "On the Nature of Sensory Arrestins of the Dipteran Insects *Anopheles gambiae and Drosophila melanogaster."* Currently, Research Geneticist, US Department of Agriculture, Agricultural Research Service (USDA-ARS) Yakima, Washington.

Tan Lu, Department of Biological Sciences, 2003-2008. (Ph.D. awarded August 2008). Thesis: "Mapping of Odor and Temperature Receptors in the Malaria Vector Mosquito *Anopheles gambiae."* Currently, Partner, Willkie Farr & Gallagher LLP, Houston, TX.

Yuanfeng Xia, Department of Biological Sciences, 2003-2008. (Ph.D. awarded December 2008). Thesis: "Molecular and cellular studies of mosquito odorant receptors and olfactory-driven larval behavior*."* Currently, Director of Assay Development, HD Biosciences, Shanghai PRC.

Patrick L. Jones, Department of Biological Sciences, 2007-2011. (Ph.D. awarded May 2011). Thesis: "Functional Characterization of Odorant Receptors in Disease Vector Mosquitoes." Currently, Staff Scientist, Genzyme/Harvard University School of Public Health.

R. Jason Pitts, Department of Biological Sciences, 2007-2011. (Ph.D. awarded May 2011). Thesis: "Novel Chemoreceptors and Gene Expression Profiling in Antennae and Maxillary Palps of *Anopheles gambiae."* Currently, Assistant Professor, Department of Biological Sciences, Baylor University.

Gregory M. Pask, Department of Biological Sciences, 2009-2013. (Ph.D. awarded May 2013). Thesis: "Exploring the Molecular Mechanisms of Insect Odorant Receptors." Currently, Assistant Professor, Department of Biology, Bucknell University.

Chao Liu, Department of Biological Sciences, 2009-2013. Thesis: "Olfactory and Thermosensory Signaling in the Malaria Vector Mosquito, *Anopheles gambiae."* Currently, Postdoctoral Fellow, University of California, Santa Barbara.

David Rinker, Program in Human Genetics, 2010-2015. Thesis: "Transcriptional Profiling and Functional Modeling of the Chemosensory Appendages of *Anopheles gambiae."* Currently, Postdoctoral Fellow, Vanderbilt University.

Stephen T. Ferguson, Department of Biological Sciences, 2015-2021. Thesis: "Odor Coding of Social Behavior in EuSocial Ants." Currently, Postdoctoral Fellow, Vanderbilt University.

Ze Yi, Department of Biological Sciences, 2016-2021. Thesis: "Localization and Mutant Analysis of the *Anopheles coluzzii Ammonium Transporter, AcAMT.* Currently, Group leader, Guizhou University, China.

Luis A. Martinez, Department of Biological Sciences, 2022-present. Thesis: "*Mode of Action of Volatile VUAA-based ExcitoRepellents"*

<u>Postdoctoral Fellows</u>

Dr. Ana Claudia do Amaral Melo, 2002-2003.
Present Appointment: Associate Professor, Federal University of Rio de Janeiro, Brasil

Dr. Michael Rutzler, 2002- 2007.
Present Appointment: Chief Executive Officer/Co-Founder, ApoGlyx AB
Research Fellow, Lund University, Sweden.

Dr. Jonathan Bohbot, 2004-2007.
Present Appointment: Associate Professor, Department of Entomology, Hebrew University, Israel.

Dr. Hyung-Wook Kwon, 2003-2009.
Present Appointment: Assistant Professor, Seoul Nat'l University, South Korea.

Dr. Guirong Wang, 2005-2010.
Present Appointment: Professor, Chinese Academy of Agricultural Sciences, Beijing

Dr. PingXi Xu, 2006-2010.
Present Appointment: Project Scientist, Department of Entomology, University of California, Davis.

Dr. Robert W. Taylor, 2011-2013.
Present Appointment: Post-Doctoral Fellow, Ann and Robert H. Lurie Children's Hospital of Chicago Research Center.

Dr. Samsudeen P. Saidu, 2013-2014.

Dr. Eunho Suh, 2011-2015.
Present Appointment: Post-Doctoral Fellow, Department of Entomology, Penn State University.

Dr. Jesse Sloane, 2010-2016.
Present Appointment: Research Assistant Professor and Principal Research Scientist, Department of Pediatrics, University of Buffalo Jacobs School of Medicine and BioMedical Sciences.

Dr. Xiaofan Zhou, 2011-2016.
Present Appointment: Professor, *Department of Plant Pathology, South China Agriculture University, Guangzhou, China.*

Dr. Mohammed Saveer Ahmed, 2013-2017
Present Appointment: Research Scientist, USDA-ARS, Beltsville MD.

Dr. Hua Hua Sun, 2019-2021
Present Appointment: Investigator, Department of Chemistry, Nankai University, Tianjin, China

Dr. Ann L. Carr, 2018-2021.
Present Appointment: Research Scientist, PathGroup, Brentwood TN

Dr. Feng (Alex) Liu, 2018-2022
Present Appointment: Principal Investigator, Institute of Infectious Disease, Shenzhen Bay Laboratory, Guangming Science City, (Guangdong) China

Dr. Stephen T. Ferguson, Department of Biological Sciences, 2022-2023.
Present Appointment: Postdoctoral Fellow, Institute of Infectious Disease, Shenzhen Bay Laboratory, Guangming Science City, (Guangdong) China

Dr. Upasana Singh, Department of Biological Sciences, 2023-

Visiting Scholars

Dr. Majid Ghaninia, Swedish University of Agricultural Sciences, Alnarp, Sweden (2007)
Dr. Xin Yi, Department of Pesticides, South China Agricultural University, Guangzhou, China.
Dr. Zei-wei Zhang, an Associate Professor, College of Forestry at Shanxi Agricultural University, Taiyuan, China.

Granting Agencies/Research Institutes

NIH Study Section, Transmission of Vector-borne and Zoonotic Diseases (TVZ), 2024-2028.
NIH Study Section, Transmission of Vector-borne and Zoonotic Diseases (TVZ), 2023 (*ad hoc*).
NIH Study Section- Infectious Disease and Immunology Fellowships (F07 C), 2021 (ad hoc)
NIH Study Section-Neurotransporters, Receptors, Channels Calcium Signaling (NTRC), 2020 (ad hoc)
NIH Anonymization Study, 2019 (*ad hoc*).
NIH Study Section-Neural Differentiation, Plasticity, Regeneration, Rhythmicity 2019 (*ad hoc*).
NIH Director's Early Independence Awards Review Panel 2019 (mail).
NIH Study Section, Vector Biology, 2018, 2019 (*ad hoc*).
NIH Study Section, Somatosensory /Chemosensory Systems, 2017, 2018 (*ad hoc*).
NIH, U19 International Centers of Excellence in Malaria Research, 2016 (*ad hoc*).
NIH, Biobehavioral Regulation, Learning, and Ethology, 2016 (*ad hoc*).
NIH ZRG1-F13 Fellowship Review Panel, 2015 (*ad hoc*).
European Union Research on Malaria Vector Control, Scientific Advisory Board, 2009-2015.
NIH Special Emphasis Panel, Sensorimotor Integration Study Section, 2014.
NIH Y56 Study Section, Communications Disorders, 2014 (*ad hoc*).
Wits Research Institute for Malaria, Scientific Advisory Board, The University of the Witwatersrand, Johannesburg, South Africa, 2013, 2014, 2015.
NIH Study Section, Vector Biology, 2013 (*ad hoc*)
Swedish University of Agricultural Sciences, Expert Advisor, Appointment Board for Professorship in Chemical Ecology, 2013.
NIH Study Section, Communications Disorders, 2013 (*ad hoc*).
Deutsche Forschungsgemeinschaft, Expert Review Panel on Integrative Analysis of Olfaction, 2013.
NIH Special Emphasis Panels, Infectious Disease and Microbiology, 2012.
Deutsche Forschungsgemeinschaft, Expert Review Panel on Integrative Analysis of Olfaction, 2012.
NIH Special Emphasis Panel, Small Business Anti-Infectives and Therapeutics, 2011.
WHO/TDR, Scientific Advisory Committee, Innovative Vector Control (BL5), 2007-12.
Deutsche Forschungsgemeinschaft, Olfactory Research Review Panel, 2010.
Malaria Eradication Research Agenda (MalERA), Scientific Advisory Board, 2010-11.
INFRAVEC, Scientific Advisory Board, Imperial College, UK, 2009-2014.
Deutsche Forschungsgemeinschaft (German Research Foundation, DfG) Review Panel on Integrative Analysis of Olfaction, 2009.
Bill and Melinda Gates Foundation, Committee on Innovative Vector Control, 2008-11.

Grand Challenges in Global Health, Ethical, Social and Cultural Working Group on Vector Safety, 2008-2011.
WHO/TDR, Molecular Entomology (BCV) Steering Committee, 2006-2007.
WHO/TDR/SDR Vector Research Transition Strategy Committee, 2007.
NIH Study Section, Somatosensory /Chemosensory Systems, 2007-2009 (*ad hoc*)
NIH Study Section, Communications Disorders, 2006 (*ad hoc*).
NIH Study Section, Somatosensory and Chemosensory Systems, 2006 (*ad hoc*)
NIH Special Emphasis Panel, ZRG1 IFCN-K (02)M, 2006 (co-chair).
NIH Special Emphasis Panel, IDM-M (02), 2005
NIH Study Section, Vector Biology, 2004-2006.
NIH Study Section, Tropical Medicine and Parasitology, 2004 (*ad hoc*).
Bill and Melinda Gates Foundation, Vector Control Consultation Group, 2004.
National Science Foundation, Integrative Neurobiology 2003, 2004.
United States Department of Agriculture, Program in Entomology, 2004.

International Scientific Award Selection/Nomination Committees

King Faisal Science Prize, Selection Committee, 2024.
VinFuture Science Prize, Nomination Committee, 2024.

Additional (*ad hoc*) Service for International Funding Agencies:

Deutshe Forschungsgemeinschaft (DfG) German Research Foundation;
Biotechnology and Biological Sciences Research Council (BBSRC), United Kingdom;
Royal Society Fellowship Programs, UK; Human Frontier Science Program, Strasborg, France; Istituto Pasteur-Fondazione Cenci Bolognetti, Italy. Institut Pasteur, Paris, France; Wellcome Trust, United Kingdom; Volkswagen Stiftung, Germany.

Journals (*ad hoc*):

(Partial list) *Archives of Insect Biochemistry and Physiology; BMC Genomics; Cell; Cell Reports; Cell and Tissue Research; Chemical Senses; Current Biology; Development, Genes and Evolution; EMBO Journal; Insect Molecular Biology; Insect Biochemistry and Molecular Biology; International Journal for Parasitology; Journal of Neurobiology; Journal of Neuroscience; Nature; Nature Communications; Neuron; Proceedings of the National Academy of Science (USA); PLoS Biology (Guest Associate Editor, 2016); PLoS ONE; Physiological Entomology; Science; Trends in Genetics; Trends in Parasitology.*

Peer Reviewed Publications:

***** denotes equal contributions

1) Preferential selection of deletion mutations of the outer membrane lipoprotein gene of *E. coli* by globomycin. **Zwiebel, L.J.**, Inukai, M., Nakamura, K. and Inouye, M., *J. Bacteriology* (1981) 45:654-656.

2) Evolution of single-copy DNA and the ADH gene in seven Drosophilids**. Zwiebel, L.J.**, Cohn, V.H., Wright, D.R. and Moore, G.P., *J. Molecular Evolution* (1982) 19: 62-71.

3) Germ-line transformation involving DNA from the *period* locus in *Drosophila melanogaster*: Overlapping genomic fragments that restore circadian and ultradian rhythmicity to per^0 and per^- mutants. Hamblen, M., Zehring, W.A., Kyriacou, C.P., Reddy, P., Yu, Q., Wheeler, D.A., **Zwiebel, LJ.**, Konopka, R.J., Rosbash, M. and Hall, J.C., *J. Neurogenetics* (1986) 3(5): 249-291.

4) A new mutation at the *period* locus of *Drosophila melanogaster* with some novel effects on circadian rhythms. Hamblen-Coyle, M., Konopka, R.J., **Zwiebel, L.J**., Dowse, H.B., Rosbash, M. and Hall, J.C., *J. Neurogenetics*. (1989) 5:229-256.

5) The *period* gene and biological rhythms in Drosophila. Rosbash, M., Colot, H.V., Ewer, J., Liu, X., Petersen, G., Siwicki, K., Yu, Q., **Zwiebel, L.J**. and Hall, J.C. *Molecular Neurobiology Proceedings of the First NIMH Conference* (S. Zalcman and R. Scheller, Eds.), pp. 128-134, (1989) 89-1619.

6) The Strength and Periodicity of *D. melanogaster* Circadian Rhythms are Differentially Affected by Alterations in *period* Gene Expression. Liu, X., Yu, Q., Huang, Z., **Zwiebel, L.J**., Hall, J.C., and Rosbash, M., *Neuron* (1991) 6:753-766.

7) A post-transcriptional mechanism contributes to circadian cycling of a *per* ß-galactosidase fusion protein. **Zwiebel, L.J.,** Hardin, P.E., Liu, X. Hall, J.C. and Rosbash, M., *Proceedings of the National Academy of Science, USA* (1991) 88:3882-3886.

8) Circadian oscillations in protein and mRNA levels of the *period* gene of *Drosophila melanogaster*. **Zwiebel, L.J**., Hardin, P.E., Hall, J.C. and Rosbash, M., *Biochemical Society Transactions*, London, (1991) 19:533-53.

9) The *period* protein of *Drosophila melanogaster* encodes a predominantly nuclear protein in adult Drosophila. Liu, X., **Zwiebel, L.J**., Hinton, D., Benzer, S. Hall, J.C. and Rosbash, M., *J. Neuroscience* (1992) 12(7) 2735-2744.

10) Temporal phosphorylation of the Drosophila *period* protein. Edery, I., **Zwiebel, L.J.,** Dembinska, M.E. and Rosbash, M., *Proceedings of the National Academy of Science, USA* (1994) 91: 2260-2264.

11) The *white* gene of the Mediterranean fruitfly *Ceratitis capitata*: a phenotypic marker for germline transformation**. Zwiebel, L.J**., Saccone, G. Zacharopoulou, A., Besanasky, N., Favia, G., Collins, F., Louis, C., and Kafatos, F.C., *Science* (1995) 270: 2005-2007.

12) Isolation and Characterization of the *white* locus from the Mediterranean fruitfly *Ceratitis capitata*. Gomulski, LM, Pitts, RJ, Costa, S., Saccone, G., Torti, C. Malacrida, A., Kafatos F.C. and **LJ Zwiebel***, Genetics* (2001) Mar; 157(3): 1245-55. PMID: 11514452.

13) Isolation and Functional Characterization of the *Xanthine Dehydrogenase* gene of the Mediterranean fruit fly, *Ceratitis capitata*, R. J. Pitts and **L. J. Zwiebel** *Genetics* (2001) Aug; 158:1645-1655. PMID: 11514452.

14) Candidate Odorant Receptors from the Malaria Vector Mosquito *Anopheles gambiae* and Evidence of Down-regulation in Response to Blood Feeding. Fox, A.N.*, Pitts, R.J.*, Robertson, H.M., Carlson, J. and **Zwiebel, L.J**. *Proceedings of the National Academy of Science, USA* (2001) 98: 14693-14697. PMID: 11724964.

15) Visual Arrestins in Olfactory Pathways of *Drosophila* and the Malaria Vector Mosquito *Anopheles gambiae.* Merrill, C.E., Riesgo-Escovar, J., Pitts, R.J., Kafatos, F.C., Carlson, J.R. and **Zwiebel, L.J**. (2002) *Proceedings of the National Academy of Science, USA 99*: 1633-1638 (Journal Cover). PMID: 11792843.

16) A Cluster of Candidate Odorant Receptors from the Malaria Vector Mosquito, *Anopheles gambiae*. Fox, A.N.*, Pitts, R.J.*, and **Zwiebel, L.J.** *Chemical Senses* (2002) Jun; 27 (5): 453-459. PMID: 12052782.

17) G-protein Coupled Receptors in the Malaria *Anopheles gambiae*. Hill, C.H.*, Fox, A.N.*, Pitts, R.J.*, Hunt, L.H., Collins, F.C., Robertson, H.M. and **L.J. Zwiebel**, *Science* (2002) 298:176-178. PMID: 12364795.

18) Identification of a Distinct Family of Genes Encoding Atypical Odorant-Binding Proteins in the Malaria Vector Mosquito, *Anopheles gambiae*. P.X. Xu, **L.J. Zwiebel** and Dean P. Smith. *Insect Molecular Biology* (2003) 12 (6) 549-560. Selected by the Royal Entomology Society (UK) as the best article in *Insect Molecular Biology* for 2002-2003. PMID: 14986916.

19) Molecular Characterization of Arrestin Family Members in the Malaria Vector Mosquito *Anopheles gambiae.* C. Elaine Merrill, R. Jason Pitts and **L. J. Zwiebel**, *Insect Molecular Biology* (2003) 12 (6) 641-650. PMID: 14986925.

20) Olfaction: Mosquito Receptor for Human Sweat Odorant. Hallem, E., Fox, A. N., **Zwiebel, L.J**. and J. R. Carlson, *Nature,* (2004) 427:212-213. PMID: 14724626.

21) A Highly Conserved Candidate Chemosensory Receptor Expressed in Both Olfactory and Gustatory Tissues in the Malaria Vector Mosquito, *Anopheles gambiae*. R. J. Pitts, A. N. Fox and **L.J. Zwiebel**, *Proceedings of the National Academy of Sciences, (2004)* 101: 5058-5063. PMID: 15037749.

22) Identification of a Chemosensory Receptor from the Yellow Fever Mosquito, *Aedes aegypti*, that is Highly Conserved and Expressed in Olfactory and Gustatory Organs. C.A. do Ameral Melo*, R. J. Pitts* M. Rützler *, and **L.J. Zwiebel**, *Chemical Senses,* (2004) 29:403-410. PMID: 15201207.

23) Olfactory Regulation of Mosquito-Host Interactions. **L. J. Zwiebel** and W. Takken, *Insect Biochemistry and Molecular Biology* (2004) 34/7:645-652. PMID: 15242705.

24) Odorant-Specific Requirements for Arrestin Function in *Drosophila* Olfaction. Merrill, E.C., Sherertz, T., Walker, W. B. and **L.J. Zwiebel**, *J. Neurobiology* (2005) 63(1) 15-28. PMID: 15627264.

25) Molecular Biology of Insect Olfaction: Recent Progress and Conceptual Models. Michael Rützler and **L.J. Zwiebel**, *Journal of Comparative Physiology A. Neuroethology, Sensory, Neural and Behavioral Physiology (2005)* 11: 1-14. PMID: 16094545.

26) Identification and Characterization of an Odorant Receptor from the West Nile Virus Mosquito, *Culex quinquefasciatus*. Yuanfeng Xia and **Laurence J. Zwiebel** *Insect Molecular Biology and Biochemistry* (2006) 36: 169-176. PMID: 16503478.

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