Curriculum Vitae

(Updated 6-10-2014)

Robert P. Lane, Ph. D.

Associate Professor
Department of Molecular Biology and Biochemistry
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Education:

1982-1986 B.A. in Biology, Colgate University, Hamilton, NY, U.S.A.
Summa Cum Laude, Phi Beta Kappa

1989-1996 Ph.D. in Molecular Biology (mentor: William Dreyer), California Institute of Technology, Pasadena, CA, U.S.A.

Academic Appointments:

2008-present Associate Professor, Department of Molecular Biology and Biochemistry, Wesleyan University, Middletown, CT, U.S.A.

2002-2008 Assistant Professor, Department of Molecular Biology and Biochemistry, Wesleyan University, Middletown, CT, U.S.A.

2000-2002 Postdoctoral Fellow, Human Biology Division (mentor: Barbara Trask), Fred Hutchinson Cancer Research Center, Seattle, WA, U.S.A.

1997-2000 Postdoctoral Fellow, Department of Molecular Biotechnology (mentor: Leroy Hood), University of Washington, Seattle, WA, U.S.A.

Grant Support and Research Awards:

1996-1999 NIH Training Grant Postdoctoral Award, University of Washington

2002-2003 Wesleyan Project Grant, Wesleyan University; $1,500 awarded

2003-2008 **NIH RO1-DC006267-01** (PI, Lane), NIH/NIDCD, *Pheromone Receptor Genomic Evolution and Gene Regulation*; $1,781,000 awarded.

2009-2011 **NSF MCB-0842868** (PI, Lane), Cross-Disciplinary Science and Investigation of Olfactory Receptor Gene Regulation; $300,000 awarded.

2010-2015 **NIH RO1-DC006267-06** (PI, Lane), NIH/NIDCD, *Mutually Exclusive Odorant Receptor Gene Regulation*; $2,073,750 awarded.

Scholarship

• Publications

Lane, R. P., X-N Cheng, K. Yamakawa, J. Vielmetter, J. Korenberg, and W. J. Dreyer (1996). Characterization of a highly conserved human homolog to the chicken neural cell surface protein Bravo/Nr-CAM that maps to chromosome band 7q31. *Genomics* **35**, 456-465.

Vielmetter, J., X-N Cheng, K. Yamakawa, F. Miskevich, **R. P. Lane**, J. Korenberg, and W. J. Dreyer (1997). Molecular characterization of human neogenin, a DCC-related protein, and mapping of its gene to chromosomal position 15q22.3-q23. *Genomics* **41**, 414-421.

Rowen L., Wong G. K., **Lane R. P.,** and Hood L. (2000). Intellectual property. Publication rights in the era of open data release policies. *Science* **289**, 1881.

Fitzli, D., Stoeckli E. T., Kunz S., Siribour K., Rader C., Kunz B., Kozlov S. V., Buchstaller, A., **Lane R. P.**, Suter D. M., Dreyer W. J., and Sonderegger P. (2000). A direct interaction of axonin-1 with NgCAM-related cell adhesion molecule (NrCAM) results in guidance, but not growth of commissural axons. *J. Cell Biol*. **149**, 951-968.

Lane, R. P., Cutforth T., Young J., Athanasiou M., Friedman C., Rowen L., Evans G., Axel R., Hood L., and Trask B. J (2001). Genomic analysis of orthologous mouse and human olfactory receptor loci. *Proc Natl Acad Sci U.S.A*. **98**, 7390-7395.

Lane, R. P., Cutforth T., Friedman C., Axel R., Trask B. J., and Hood L (2002). Genomic analysis of the murine chromosome-6 vomeronasal receptor gene cluster reveals common promoter motifs and a history of local duplication. *Proc Natl Acad Sci U.S.A*. **99**, 291-296

Lane, R. P., Roach J., Lee, I., Boysen C., Smit A., Trask B. J., and Hood L (2002). Genomic analysis of the olfactory receptor region of the mouse and human T-cell receptor alpha/delta loci. *Genome Research* **12**, 81-87

-- Appointment as Assistant Professor at Wesleyan University, July, 2002

Young J. M., Shykind B. M., **Lane R. P**., Tonnes-Priddy L., Ross J. A., Walker M., Williams E. M., and Trask B. J. (2003). Odorant receptor expressed sequence tags demonstrate olfactory expression of over 400 genes, extensive alternate splicing and unequal expression levels. *Genome Biol*. **4**, R71.

Lane, R. P., Young J., Newman T., and Trask B. (2004). Species specificity in rodent pheromone receptor repertoires. *Genome Res*. 14: 603-608*.

***Research article featured in *The Chronicle of Higher Education* (Aug 2004; http://chronicle.com/weekly/v50/i48/48a01401.htm)**

Young, J.#, Kambere, M.-J.#, Trask, B. J., and **Lane, R. P.** (2005). Divergent V1R repertoires in five species: amplification in rodents, decimation in primates, and a surprisingly small repertoire in dogs. *Genome Res*. 15: 231-40. [#Co-first authorship]

Lane, R. P., Smutzer, G. S., and Doty, R. L. (2005). Sense of Smell. In: Encyclopedia of Molecular Cell Biology and Molecular Medicine. R.A. Meyers, Ed. Volume 12. Second Edition. Wiley, pp. 637-705.

Kambere, M-J., and **Lane, R. P.** (2007). Co-regulation of large and rapidly evolving repertoires of odorant receptor genes. *BMC Neurosci*. 8(Suppl 3): S2.

Stewart, R. and **Lane, R. P.** (2007). V1R promoters are well conserved and exhibit common putative regulatory motifs. *BMC Genomics*. 8: 253.

Lane, R. P., Smutzer, G. S., and Doty, R. L. (2008). Sense of Smell. In: Neurobiology, From Molecular Basis to Disease. R. A. Meyers, Ed. Volume 1. Weinheim: Wiley-VCH Verlag, pp. 163-232 [republished in second textbook].

Pathak, N., Johnson, P., Getman, M., and **Lane, R. P.** (2009). Odorant receptor (OR) gene choice is biased and non-clonal in two olfactory placode cell lines, and OR RNA is nuclear prior to differentiation of these lines. *J. Neurochem.* 108(2): 486-97.

Kambere, M-J., and **Lane, R. P.** (2009). Exceptional LINE density at V1R loci: the Lyon repeat hypothesis revisited on autosomes. *J. Mol. Evol.* 68(2): 145-59.

Kurzweil, V., Getman, M., NISC Comparative Sequencing Program, Green E. D., and **Lane, R. P.** (2009). Dynamic evolution of V1R putative pheromone receptors between *mus musculus* and *mus spretus BMC Genomics*. 10:74.

-- Appointment as Associate Professor at Wesleyan University, July, 2009

Clowney, E. J., Magklara, A., Colquitt, B. M., Pathak, N., **Lane, R. P.,** and Lomvardas, S. (2011). High-throughput mapping of the promoters of the mouse olfactory genes reveals a new type of mammalian promoter and provide insight into olfactory receptor gene regulation. *Genome Research*, 21(8): 1249-59.

Kilinc, S, Meredith, D.T., and **Lane, R. P.** (2014). Sequestration within nuclear chromocenters is not a requirement for silencing olfactory receptor transcription in a placode-derived cel line. *Nucleus*, 5(4): 1-13.

Savarino, A #, Kilinc, S #, and **Lane, R. P**. The lysine-specific demethylase 1 (LSD1) protein associates with Olfactory Receptor (OR) genes in a cell-cycle dependent manner in cells derived from the olfactory sensory neuronal lineage. (In preparation; estimated submission by July, 2014).

Kilinc, S., Meredith, D.T., Clowney, J., Lomvardas, S., and **Lane, R. P.** Olfactory Receptor (OR) gene selection in olfactory placode-derived cells lines is influenced by genome position. (In preparation; estimated submission by August, 2014).

• Conference Presentations

Lane, R. P. "Species specificity in pheromone receptor loci?" Association for Chemosensory Sciences, Sarasota, FL, April 2003.

Lane, R. P., Young, J., Newman T., Trask, B. J. "Species specificity in pheromone receptor loci". Association for Chemosensory Sciences, Sarasota, FL, April 2004.

Lane, R. P., Young, J., Newman T., Trask, B. J. "Divergent V1R repertoires in five species". Association for Chemosensory Sciences, Sarasota, FL, April 2005.

Kambere, M., Pathak, N., Getman, M., and **Lane, R. P.** "A rate-limiting role for chromatin in odorant receptor gene regulation." ABCAM Chromatin Meeting, Nassau, Bahamas, Nov. 2005.

Lane, R. P., Young, J., Newman T., Trask, B. J. "A rate-limiting role for chromatin in odorant receptor gene regulation." Association for Chemosensory Sciences, Sarasota, FL, April 2006.

Stewart, R., and **Lane, R. P.**, "V1R promoters are well conserved and exhibit common putative regulatory motifs." Keystone Symposium on Olfaction, Snowbird, UT, Jan. 2007

Pathak, N., Johnson, P., Getman, M., and **Lane, R.P.,** "Odorant receptor (OR) gene choice is biased and non-clonal in two olfactory placode cell lines, and OR RNA is nuclear prior to differentiation of these lines." International Symposium on Olfactaction and Taste, San Francisco, CA, July 2008

Lane, R.P., Savarino, A., Vyas, R., and Kilinc, S. "Epigenetic Regulation of Olfactory Receptor Genes." Gordon Research Conference, Barga, Italy, May, 2012

Kilinc, S, Clowney, J., and **Lane, R.P.,** "OR gene expression profiles and nuclear organization in olfactory placode-derived (OP) cell lines." International Symposium on Olfactaction and Taste, Stockholm, Sweden, June 2012

Kilinc, S, Savarino, A., Vyas, R., and **Lane, R.P.,** "Mutually exclusive odorant receptor gene expression". Association for Chemosensory Sciences, Los Angeles, CA, April 2013.

Kilinc, S, Meredith, M., Savarino, A., Vyas, R., and **Lane, R.P.,** "Mutually exclusive OR expression in the OP6 cell line". Association for Chemosensory Sciences, Fort Myers, FL, April 2014.

• Invited Seminars

June 2004 Tufts University School of Medicine, Boston MA; hosted by Dr. James Schwob, Professor of Developmental, Molecular & Chemical Biology

Aug. 2006 University, New York NY; hosted by Dr. Stuart Firestein, Professor of Biological Sciences

Jun. 2007 NESCent Catalysis Meeting, Durham NC (sponsored by the National Science Foundation); invited by Dr. Roy Plotnick, Professor of Earth and Environmental Sciences, University of Illinois at Chicago.

Nov. 2009 Colgate University, Hamilton, NY; hosted by Dr. Jason Meyers, Professor of Biology

May 2012 Tufts University School of Medicine, Boston MA; hosted by Dr. James Schwob, Professor of Developmental, Molecular & Chemical Biology

May 2013 University of Connecticut Medical School, Storrs, CT; hosted by Dr. Kristen Martins-Taylor, Assistant Professor, Genetics and Developmental Biology.

Teaching Experience:

MB&B 181, Principles of Molecular and Cell Biology (2009-present)
One of the largest classes taught at Wesleyan University, primarily for incoming students interested in pursuing a life science major. A major challenge of this class is its student composition with diverse levels of preparation. The primary goals of this class are to prepare all incoming students for subsequent levels of the curriculum with an ambitious syllabus and to motivate a general interest in the sciences.

MB&B 210, Genetics and Genomics (2004, 2008, 2011, 2012, 2014)
A core elective within the MB&B and Biology majors focused on classical Mendelian genetics and modern genomics. Topics include: chromosomal theory of inheritance, recombination, human genetics, epistasis, developmental genetics, population genetics, DNA sequencing technologies and the Human Genome Project, comparative genomics, bioinformatics, systems biology, and genomic medicine.

MB&B 208 Molecular Biology (2004, 2007)
The gateway course at the entry of the MB&B major, typically taken by sophomores, that is focused on the structural and biochemical properties of molecular machines inside cells. The course entails detailed discussions about the molecular components inside cells (nucleic acids, proteins, metabolites), major metabolic processes (DNA replication, transcription, translation, catalysis, signal transduction, energetics, etc.), and the ways cells regulate behavior in response to signals.

MB&B 333 Gene Regulation (2003, 2006, 2009, 2015)
An advanced elective within the MB&B and Biology majors focused on the genetic and epigenetic mechanisms of transcriptional gene control. This course brings in recently published articles on a range topics including RNA polymerase structure/function, transcriptional initiation complexes, enhancers and transcription factors, chromatin structure, and nuclear organization.

MB&B 203 Copernicus, Darwin, and the Human Genome Project (2007, 2008)
A general education science course intended for non-science majors at Wesleyan that discusses major paradigm shifts in science using three specific moments in scientific history: the Copernican revolution, the Darwinian revolution, and the current Genomics revolution. Each of these episodes have challenged us on questions about what it means to be human.

Additional Courses:
Science and Science Fiction Film (MB&B 202, co-taught with Film Department)
Advanced Genomics (MB&B 331)
Research Frontiers (MB&B 209)
Honors Introductory Biology (MB&B 195, MB&B 193)
Research Seminars in Molecular Biology (MB&B 557)
Molecular Biology Journal Club (MB&B 586)

Advanced Research Training:

- *Undergraduate Research for Credit (MB&B 421/422, MB&B 423/424)*
  Student involvement in the research lab has ranged from casual participation in a weekly research tutorial to the completion of an Honors or Masters Thesis and publication of significant results in international journals. I encourage students to find their own level of desired involvement, and while many students choose a more passive role, I believe that their merely bearing witness to raw scientific data and discussion in weekly group meetings is a rich educational experience for our majors. I have supervised 34 undergraduate students in the lab since my arrival at Wesleyan in 2002 (Marsch, Nerenz, Hall, Katz, Tachibana, Stewart, Sanchez, Levy, Kurzweil, Johnson, Illsley, Wagner, Wilder, Carman, Spruijt, Mamut, Cho, Wagner, Savarino, Dutra, Parsons, Cheng, Graff, Farber, Coffey, Beaudoin, Rosenbloom, Yan, Chung, Bhulyan, Smith, Schissler, Weiss, Logan).

- *Undergraduate Summer Research Fellowships*
  I have utilized the Howard Hughes grant, university grants, and my own grants from the National Institutes of Health and National Science Foundation to supervise summer research projects and support student stipends for 15 undergraduate students since my arrival at Welseyan in 2002 (Katz, Hall, Levy, Sanchez, Tachibana, Kurzweil, Johnson, Illsley, Wilder, Wagner, Stewart, Spruijt, Dutra, Coffey, Savarino).

- *Undergraduate Recognition for Research*
  I have supervised one undergraduate Honors thesis (Kurzweil, 2007), one BA/MA student (Savarino, 2014-2015), and three undergraduate projects that culminated in research publications (Stewart 2007, Kurzweil 2009, Johnson 2009). Additional student research recognitions include: Emily Levy awarded a Pfizer scholarship in 2005, Kathryn Wagner selected as a university nominee for a Barry M. Goldwater scholarship in 2010, and Alyssa Savarino winning a travel award and invited to speak at the international ASBMB conference in 2013.

- *PhD Research Training*
  I have supervised two PhD theses (Kambere in 2009, Pathak in 2010), with a third student scheduled to defend in the current year (Kilinc in 2014). I am currently mentoring two other Wesleyan PhD students (Vyas, Noble) and one non-Wesleyan PhD student at Tufts university (Hewitt). I have mentored four additional Wesleyan PhD students who did not complete their degrees (Putnik, Labanca, Zeraslase, Gupta) and supervised 9 research rotation projects (Neema, Lazarus, Paptanariu, Motwani, Zhai, Arnone, Sawant, Zheng, Huang).

University and Departmental Service:

Elected, Wesleyan Advisory Committee (2004, 2011-2012, 2013-2014)
One of three faculty members from Division 3 (Natural Sciences and Mathematics) elected to participate on the Advisory Committee that evaluates university faculty promotion, tenure, and reappointment cases.

Elected, Wesleyan Compensation and Benefits Committee (2006-2008)
Faculty representative to committee that negotiates faculty compensation with university administration.

Selected, Wesleyan Ad Hoc Committee on the "FYI" curriculum (2011)
Discussed history, successes and shortcomings of the "First-Year Initiative" (FYI) curricula. Contributed to preparation of report on FYI for Wesleyan faculty and administration.

Appointed, Wesleyan University Campus Computing Committee (2002-2013)
Participation in campus core computing projects, including implementation of the Integrated Genome Sciences work spaces. Participated in recruitment and interviewing of campus computing personnel.

Appointed, Wesleyan University Graduate Council (2005-2007, 2013-2014)
Departmental representative on council that administers all business concerning the Wesleyan graduate school.

Appointed, Wesleyan University Library Committee (2009-2013)
Departmental representative on council that administers all business concerning the Wesleyan library system as it relates to faculty scholarship.

Additional Departmental Service (2002-present)
Participation in a wide range of departmental business, including Graduate Admissions (2003-2005) and Graduate Advising (2006-2007), steering committees for introductory courses in the Life Sciences (2004-present), faculty hiring committees for our previous three departmental hires (Flory, MacQueen, Olson), contributions to the MB&B departmental report for external review (2013), implementation of the department self-assessment strategy (2011-present), and participation on various departmental, divisional, and university ad hoc committees. Invited and hosted ten visiting scholars for the MB&B seminar series (2002-present). Service on 11 post-graduate thesis committees (Thayer, Martins-Taylor, Kambere, Pathak, Gupta, Heiss, Arnone, Gladstone, Sharma, Arace, Soorneedi) and 8 undergraduate thesis committees (Raducha-Grace, Chan, Hickman, Rozario, Kurzweil, Schilit, Graff, Kamitaki).

Additional University Service (2002-present)
Contribution to a wide range of university activities, including service as faculty advisor for the Wesleyan Science House (2004-2008), participation on new faculty orientation panels (2005), participation/collaboration on the Hughes Grant Steering committee (2003-2011), organization of an open cross-disciplinary mini-symposium on the SETI project (2006), and presentation at various Wesleyan functions (to trustees in Boston on invitation of the VPAA in 2005, at the Biophysics retreat in 2002 and 2007, at NSM meetings in 2003, 2006, and 2012, for a Weseminar in 2005, and at President Roth's faculty luncheon in 2013).

Scholarly Service and Professional Affiliations (2002-present)

- *Ad hoc journal reviewer requests*
  Proceedings of the National Academy of Sciences (2002)
  Human Molecular Genetics (2003)
  Molecular Biology and Evolution (2004, 2008, 2009)
  Genome Research (2005)
  Genomics (2005)
  Chemical Senses (2006)
  BMC Genomics (2006, 2008, 2009, 2014)
  FEBS Letters (2006)
  PLoS Genetics (2006, 2007, 2008)
  BMC Bioinformatics (2007)
  PLoS Pathogens (2007)
  Genetics (2007)
  Trends in Genetics (2007, 2009)
  BMC Evolutionary Biology (2008)
  PLoSONE (2008, 2012)
  Genome Biology and Evolution (2009, 2011)
  Journal of Heredity (2009)
  EJN (2010)
  Neuropsychopharmacology (2012)
  Nucleic Acids Research (2014)

- *Ad hoc grant review panel requests*
  R03 Special Emphasis Panel, National Institutes of Health
  (2003, 2004, 2005, 2009, 2010, 2011)
  K58 Special Emphasis Panel, National Institutes of Health (2005)
  Swiss National Science Foundation (2004)
  Minority Biomedical Research Support, National Institutes of Health (2009)
  National Science Foundation CAREER Proposal Review (2009)
  South Africa's National Research Foundation (2009)
  R01 Special Emphasis Panel, National Institute of Health (2009)
  Israel Binational Science Foundation (2010)

- *Association of Chemosensory Sciences*
  Member (2002-present)
  Selected, Program Planning Committee (2005-2009)