

***CURRICULUM VITAE***

**Michael McKeown**

Professor of Medical Science  
Division of Biology and Medicine  
Molecular Biology, Cell Biology and Biochemistry Department  
Brown University  
Providence, RI 02912

**Education**

Undergraduate: Stanford University, Stanford, CA. BS Biological Sciences, 1975  
Graduate: University of California, San Diego, PhD Biology, 1981. *The Actin Multigene Family of Dictyostelium*

**Professional Appointments**

Nov 1981-Aug 1985 Postdoctoral fellow with Dr. Bruce Baker working on sex determination in *Drosophila melanogaster*  
Aug 1985-April 1991 Assistant Professor, The Salk Institute  
April 1991-present Associate Professor, The Salk Institute  
1995 - present Adjunct Associate Professor of Biology at UCSD  
1995 - 2000 Institute for Biomedical Engineering, UCSD  
2000 – present Professor of Medical Science, Program in Molecular Biology, Cell Biology and Biochemistry, Brown University

## Completed Publications

### Chapters in Books

- Kindle, K, Taylor, W.C., McKeown, M. and Firtel, R.A. (1977) Analysis of gene structure and transcription in *Dictyostelium discoideum*. **In** Developments in Cell Biology Vol. 1: Development and Differentiation in the Cellular Slime Moulds. Cappuccinelli, P. and Ashworth, J.M. eds. Amsterdam, Elsevier, North Holland. 273-290.
- McKeown, M., Kimmel, A.R. and Firtel, R.A. (1981) Organization and expression of the actin multigene family in *Dictyostelium*. **In** Developmental Biology Using Purified Genes, ICN-UCLA Symposia on Molecular and Cellular Biology **23**: Brown, D. and Fox, C.F. eds. 107-116.
- Firtel, R.A., McKeown, M., Poole, S., Kimmel, A.R., Brandis, J. and Rowekamp, W. (1981) Developmentally regulated multigene families **In** *Dictyostelium discoideum*. *Genetic Engineering 3*, Setlow, J.K. and Hollaender, A. eds. Plenum, N.Y. 265-318.
- McKeown, M., and Firtel, R. A. (1982). The actin multigene family in *Dictyostelium*. Organization of the Cytoplasm, Cold Spring Harbor Symp. Quant. Biol. **46**:495-505.
- McKeown, M., MacLeod, C., and Firtel, R. A. (1982). Actin genes in *Dictyostelium*. **In** Muscle Development, Cold Spring Harbor Press, Cold Spring Harbor, New York.
- McKeown, M., Hirth, K.-P., Edwards, C. and Firtel, R.A. (1982) Examination of the regulation of the actin multigene family in *Dictyostelium discoideum*. **In** Embryonic Development, Part A: Genetic Aspects. Burger, M. and Weber, R. eds. Alan R. Liss, Inc. N.Y. 51-78.
- McKeown, M., Belote, J. M., Andrew, D. J., Scott, T. N. Wolfner, M., and Baker, B. S. (1986). Molecular genetics of sex determination in *Drosophila*. Annual Symposium of the Society for Developmental Biology **44**, Alan R. Liss, Inc., New York, pp. 3-17.
- Belote, J. B., McKeown, M., Andrew, D. J. Scott, T. N., Wolfner, M., and Baker, B. S. (1985). The control of sexual differentiation in *Drosophila melanogaster*. Cold Spring Harbor Symp. Quant. Biol. **50**:605-614.
- McKeown, M., Boggs, R.T., Nash, K., Ohkawa, R., Manly, A., Sosnowski, B.A., and Belote, J.M. (1989) The use of germline transformation in the study of sexual differentiation in *Drosophila*. **In** Gene

Transfer in Animals, UCLA Symposia on Molecular and Cellular Biology, New Series, Volume 87 (I. Verma, R. Mulligan, A. Beaudet, eds) Alan R. Liss Inc., New York, NY, 1-8.

McKeown, M. (1990) Regulation of alternative splicing. Genetic Engineering, Principles and Methods, J. Setlow ed. Vol. 12, 139-181.

McKeown, M. (1992) Alternative mRNA splicing. Annual Review of Cell Biology, **8**, 133-155.

#### Refereed Journal Articles

McKeown, M., Kahn, M. and Hanawalt, P.C. (1976) Thymidine uptake and utilization in *Escherichia coli* : a new gene controlling nucleoside transport. J. Bacteriol. **126**: 814-822.

McKeown, M., Taylor, W. C., Kindle, K. L., Firtel, R. A., Bender, W., and Davidson, N. (1978). Multiple, heterogeneous actin genes in Dictyostelium. Cell **15**:789-800.

Firtel, R. A., Timm, R. A., Kimmel, A. R., and McKeown, M. (1979). Unusual nucleotide sequences at the 5' end of actin genes in Dictyostelium discoideum. Proc. Natl. Acad. Sci. USA **76**:6206-6210.

McKeown, M., and Firtel, R. A. (1981). Differential gene expression and 5' end mapping of actin genes in Dictyostelium. Cell **24**:799-807.

McKeown, M., and Firtel, R. A. (1981). Evidence for subfamilies of actin genes in Dictyostelium as determined by comparison of 3' end sequences. J. Mol. Biol. **151**:593-606.

McKeown, M., Belote, J. M., and Baker, B. S. (1987). A molecular analysis of *transformer*, a gene in *Drosophila melanogaster* that controls female sexual differentiation. Cell **48**:489-499.

Boggs, R.T., Gregor, P., Idriss, S., Belote, J.M., and McKeown, M. (1987) Regulation of sexual differentiation in *Drosophila melanogaster* via alternative splicing of RNA from the *transformer* gene. Cell **50**:739-747.

Nagoshi, R., McKeown, M., Burtis, K., Belote, J., and Baker, B. (1988) The control of alternative splicing at genes regulating sexual differentiation in *Drosophila melanogaster*. Cell **53**:229-236.

McKeown, M., Belote, J.M. and Boggs, R.T. (1988) Ectopic expression of the female *transformer* gene product leads to female differentiation of chromosomally male *Drosophila*. Cell, **53**:887-895.

- Oro, A.E., Ong, E.S., Margolis, J.S., Posakony, J.W., McKeown, M., and Evans, R.M. (1988) The *Drosophila* gene *knirps-related* is a member of the steroid receptor superfamily. *Nature* **336**:493-496.
- Belote, J.M., McKeown, M., Boggs, R.T., Ohkawa, R. and Sosnowski, B.A. (1989). The molecular genetics of *transformer*, a genetic switch controlling sexual differentiation in *Drosophila*. *Dev. Genetics* **10**: 143-154.
- Tearle, R.G., Belote, J.M., McKeown, M., Baker, B.S., and Howell, A.J. (1989) Cloning and characterization of the *scarlet* gene of *Drosophila melanogaster*. *Genetics* **122**: 595-606.
- Sosnowski, B.A., Belote, J.M., and McKeown, M. (1989) Sex-specific alternative splicing of RNA from the *transformer* gene results from sequence-dependent splice site blockage. *Cell* **58**: 449-459.
- Gregor, P., Mano, I., Maoz, I., McKeown, M. and Teichberg, V.I. (1989) Molecular structure of the chick cerebellar kainate binding subunit of a putative glutamate receptor. *Nature* **342**: 689-692.
- Belote, J.M., Hoffmann, F.M., McKeown, M., Chorsky, R.L. and Baker, B.S. (1990) Cytogenetic analysis of chromosome region 73AD of *Drosophila melanogaster*. *Genetics* **125**, 783-793.
- Oro, A.E., McKeown, M. and Evans, R.M. (1990) Relationship between the product of the *Drosophila ultraspiracle* locus and the vertebrate retinoic acid responsive transcription factor, the retinoid X receptor. *Nature* **347**, 298-301.
- Oro, A.E., McKeown, M. and Evans, R.M. (1992) The *Drosophila* Retinoid X Receptor homolog ultraspiracle functions in both female reproduction and eye morphogenesis. *Development* **115**, 449-462.
- Yao, T.-P., Segraves, W.A., Oro, A.E., McKeown, M. and Evans, R.M. (1992) *Drosophila* ultraspiracle modulates ecdysone receptor function via heterodimer formation. *Cell* **71**, 11-20.
- Yao, T.-P., Forman, B.M., Jiang, Z., Cherbas, L., Chen, J.-D., McKeown, M., Cherbas, P., and Evans, R.M. (1993) Functional ecdysone receptor is the product of *EcR* and *ultraspiracle* genes. *Nature* **366**, 476-479.
- Sosnowski, B.A., Davis, D.D., Boggs, R.T., Madigan, S.J., McKeown, M. (1994) Multiple portions of the *Drosophila transformer* gene are required for efficient in vivo sex-specific regulated RNA splicing and in vitro Sex-lethal binding. *Developmental Biology* **161**, 302-312.

- McKeown, M. (1994) Sex determination and differentiation. *Developmental Genetics* **15**, 201-204.
- Yu, R.T., McKeown, M., Evans, R.M. and Umesono, K. (1994) Relationship between *Drosophila* gap gene *tailless* and a vertebrate nuclear receptor, Tlx. *Nature* **370**, 375-379.
- Zelhof, A.C. Yao, T.-P., Evans, R.M. and McKeown, M. (1995) Identification and characterization of a novel *Drosophila* nuclear receptor with the ability to regulate ecdysone signaling. *Proc. Natl. Acad. Sci. USA* **92**, 10477-10481.
- Zelhof, A.C., Yao, T.-P., Chen, J.D., Evans, R.M. and McKeown, M. (1995) Seven-up inhibits Ultraspiracle-based signaling pathways in vitro and in vivo. *Mol. Cell. Biol.* **15**, 6736-6745.
- Madigan, S.M., Edeen, P., Esnayra, J. and McKeown, M. (1996) *att*, a target for regulation by *tra2* in the testis of *Drosophila melanogaster*, encodes alternative RNAs and alternative proteins. *Mol. Cell. Biol.* **16**, 4222-4230
- Finley, K.D., Taylor, B.T., Milstein, M. and McKeown, M. (1997) *dissatisfaction*, a gene involved in sex-specific behavior and neural development of *Drosophila melanogaster*. *Proc. Natl. Acad. Sci. USA.* **94**, 913-918.
- Zelhof, A.C., Ghbeish, N., Tsai, C., Evans, R.M. and McKeown, M. (1997) A role for ultraspiracle, the *Drosophila* RXR, in morphogenetic furrow movement and photoreceptor cluster formation. *Development* **124**, 2499-2506.
- Brunel, C.A., Madigan, S.J., Cassill, J.A., Edeen, P. and McKeown, M. (1998) *pcdr*, a Novel Gene with Sexually Dimorphic Expression in the Pigment Cells of the *Drosophila* Eye. *Development, Genes and Evolution* **208**, 327-335.
- Finley, K.D., Edeen, P.T., Foss, M., Gross, E., Ghbeish, N., Palmer, R.H., Taylor, B.J. and McKeown, M. (1998) *dissatisfaction* Encodes a Tailless-like Nuclear Receptor Expressed in a Subset of CNS neurons Controlling *Drosophila* Sexual Behavior. *Neuron* **21**, 1363-1374.
- Scully, A.L., McKeown, M., and Thomas, J.B. (1999) Isolation and characterization of Dek, A *Drosophila* Eph protein tyrosine kinase. *Mol. Cell. Neurosci.* **13**, 337-347.

- Tsai, C.-C., Kao, H.-Y., Yao, T.-P., McKeown, M., and Evans, R.M. (1999) SMRTER, a *Drosophila* nuclear receptor co-regulator, reveals that EcR mediated repression is critical for development. *Molecular Cell*. **4**, 175-186.
- Palmer, R. H., Fessler, L. I., Edeen, P. T., Madigan, S. J., McKeown, M., and Hunter, T. (1999) DFak56 is a novel *Drosophila melanogaster* focal adhesion kinase. *J. Biol. Chem.* **274**, 35621-35629.
- Brunel, C., Ehresmann, B., Ehresmann, C., and McKeown, M. (2001) Selection of Genomic Target RNAs by Iterative Screening. *Bioorganic and Medical Chemistry*. **9/10**, 2533-2541.
- Ghbeish, N., Tsai, C.-C., Schubiger, M., Zhou, J.Y., Evans, R.M. and McKeown, M. (2001) The dual role of Ultraspiracle, the *Drosophila* RXR, in the ecdysone response. *Proc. Natl. Acad. Sci, USA*. **98**, 3867-3872.
- Lorén, C.E., Scully, A., Grabbe, C., Edeen, P.T., Thomas, J, McKeown, M., Hunter, T. and Palmer, R.H. (2001) Identification and characterization of DALK: a novel *Drosophila melanogaster* RTK which drives ERK activation in vivo. *Genes to Cells* **6**, 531-544.
- Ghbeish, N. and McKeown, M. (2002) Analyzing the repressive function of Ultraspiracle, the *Drosophila* RXR, in *Drosophila* eye development. *Mech Dev* **111**, 89-98.
- Pitman, J.L., Tsai, C.-C., Edeen, P.T., Finley, K.D., Evans, R.M. and McKeown, M. (2002) DSF nuclear receptor acts as a repressor in culture and in vivo. *Dev Biology* **245**, 315-328.
- Finley, K.D., Edeen, P.T., Cumming, R.C., Mardahl-Dumesnil, M.D., Taylor, B.J., Rodriguez, M.H., Hwang, C.E., Benedetti, M, and McKeown, M. (2003) blue cheese mutations define a novel, conserved gene involved in progressive neural degradation. *J. Neuroscience* **23**, 1254-1264.
- Tsai C.C, Kao H.Y, Mizutani A, Banayo E, Rajan H, McKeown M, and Evans R.M. (2004) Ataxin 1, a SCA1 neurodegenerative disorder protein, is functionally linked to the silencing mediator of retinoid and thyroid hormone receptors. *Proc Natl Acad Sci U S A*. **101**:4047-52.
- Ditch, L.M., Shirangi, T., Pitman, J.L., Latham, K.L., Finley, K.D., Edeen P.T., Taylor, B.J., McKeown, M. (2005) *Drosophila* retained/dead ringer is necessary for neuronal pathfinding, female receptivity and repression of fruitless independent male courtship behaviors. *Development* **132**:155-64.

Wang, L, Rajan, H, Pitman, J.L, McKeown, M, Tsai, C.C. (2006) Histone deacetylase-associating Atrophin proteins are nuclear receptor corepressors. *Genes Dev.* **20**:525-530.

Shirangi, TR, Taylor, BJ, McKeown, M. (2006) A double-switch system regulates male courtship behavior in male and female *Drosophila melanogaster*. *Nature Genetics* **38**:1435-1439.

Shirangi, TR, McKeown, M. (2007) Sex in flies: What mind body dichotomy. *Developmental Biology* **306**, 10-19.

#### Non-Refereed Journal Articles

Harris, W. A., and McKeown, M. (1986). Binary decisions in neurogenesis. *Trends in Neurosci.* **9**:383-386.

McKeown, M. (1992) Sex differentiation: The role of alternative splicing. *Current Opinion in Genetics and Development* **2**, 299-303

Belote, J., and McKeown, M. (1985). Post-replication repair of an X-ray damaged chromosome following fertilization in *Drosophila melanogaster*. *DIS* **6**:33.34.

Oro, A.E., McKeown, M. and Evans, R.M. (1992) The *Drosophila* nuclear receptors in development: New insight into the actions of nuclear receptors in development. *Current Opinion in Genetics and Development* **2**, 269-274.

McKeown, M. and Madigan, J.M. (1992) Sex determination and differentiation in invertebrates: *Drosophila* and *C. elegans*, *Current Opinion in Cell Biology* **4**, 948-954.

McKeown, M. (1993) New insights into the role of small nuclear RNAs in RNA splicing. *Current Opinion in Cell Biology* **5**, 448-454.

#### Abstracts

No record kept of meeting abstracts published

#### Invited Lectures and papers read

Selected Invited Speakerships Since 1988

University of Colorado Symposium on RNA Molecules as Mediators of Biological Events, 1988

Department of Molecular Biology and Biochemistry, Harvard University, 1988

Department of Biology, Princeton University, 1989

Biology Department, Syracuse University, 1989

Section of Genetics and Development, Cornell University, 1989

Department of Developmental Genetics, Case Western Reserve University, 1989

Laboratory of Cellular and Developmental Biology, NIDDK, NIH, 1989

Department of Neurosciences, City of Hope National Medical Center, 1989

M.D. Anderson Cancer Center, 1989

Department of Biological Sciences, University of California, Santa Barbara, 1989

University of Florida Workshop on Transgenic Animals, 1990

UCI-ICN Meeting on Development, 1990

UCLA Symposium on Signal Transduction and Gene Activation in Development, 1990

Molecular Genetics Gordon Conference, 1990

FASEB Summer Meeting, 1990

Dept. of Biochemistry, Univ. of Texas, Southwest Medical Center, Fall 1990

Department of Biology, UCSD, Fall 1990

Department of Biochemistry, University of Wisconsin, Fall 1990

Cornell University Medical School, Fall 1990

Molecular Recognition: RNA-Protein Interactions, Urbino, Italy, Fall 1991

Reproductive Physiology, UCSF, November 1991

Merck Research Laboratories, November 1993

Department of Zoology, Oregon State University, February 1994

Department of Zoology, University of Washington, February 1994

Department of Genetics, University of Washington, February 1994

Department of Biology, University of Southern California, May 1995

National Drosophila Conference, Plenary Session Speaker, April 1996

Molecular Biology, Loyola University, Chicago, November 1997

Department of Biochemistry and Cell Biology, SUNY Stony Brook, 1998 Stony Brook Symposium



Laboratory of Cellular and Developmental Biology, NIDDK, NIH, September 1998

Department of Biological Sciences, Stanford University, February 1999

Department of Biology, UCSD, June 1999

Developmental Biology Gordon Research Conference, June 1999

Department of Cell and Developmental Biology, Oregon Health Sciences University, July 1999

Hormone Action Gordon Research Conference, July 1999

Plant Gene Expression Center, UC Berkeley and USDA/ARS, September 1999

Division of Biology and Medicine, Brown University, October 1999

UC Berkeley Neuroscience Seminar Series, January 2000

Division of Biology and Medicine, Brown University, February 2000

Nuclear Receptors 2000, Keystone Symposium, March 25-31, 2000

Conference on Genetic Influences on Human Behavior and Development, Brown Univ. April 2001

New England Biolabs, September 2001

MCB Faculty Lecture Series, Brown University, October 2001

University of Southern California, Molecular and Computational Biology, November 2008

Janelia Farm (HHMI) Invited Speaker as part of symposium on Neural Circuits Underlying Sexual  
Behavior October 2009

#### Invited Session Chairman

Developmental Biology Gordon Conference, 1989

#### Recent Invited Lectures on Educational Topics Outside Biology

Rhode Island College Mathematics Department, Winter 2001

Education Leaders Council, Annual Meeting, Fall 2001

American Enterprise Institute, Conference on Math Education, March 2002

**Research in Progress**

Papers in Preparation or Revision:

Finley, KD, Pitman, JL, Ghbeish, N, Edeen, PT, Ditch, L. and McKeown, M.. Visual System Expression of the Drosophila Nuclear Receptor *dissatisfaction*

Ditch, LM, Taylor, BT, Pitman, JL, and McKeown, M. Drosophila *retained /dead ringer* is Necessary for Reproductive Tract Development and Fertility in Drosophila Females and Males

Shirangi, T.R, Wilson, L.K., Finley, K.D., Taylor, B.J. and McKeown, M. The Drosophila *dissatisfaction* gene acts downstream of *fruitless* to control male and female behavior and neural development. In Revision

Other research in progress:

- Analysis of the courtship song of *dissatisfaction* males.
- Identifying regions within the brain requiring *dissatisfaction* expression for generation of female receptive behaviors, egg laying and generation of male like courtship by females. Determining if *dsf* control acts in concert with activities of *retained*, *fruitless*, or *doublesex*. Determining if *dissatisfaction* function in these regions involves repression of transcription or activation.
- Testing models of how *fruitless* controls the sex-specific activities of *dissatisfaction*, with a current emphasis on direct interaction between Fruitless protein and Dissatisfaction in males.
- Development of a version of the *dissatisfaction* gene, in its normal chromosomal location, that contains Gal4 inserted just downstream of the start codon such that a *dissatisfaction* null-mutant gene that produces Gal4 protein in the *dissatisfaction* expression pattern.
- Developing homologous recombinants marking expression of *doublesex*,

## Research Grants

### Current:

- *dissatisfaction retained* and the Sex Behavior Network

Principal Investigator: Michael McKeown

Agency: National Institutes of Health/Institute of Neurological Disorders and Stroke

Type: Research Grant (R01)                      Score: 125    Percentile: 3.2

Period: 2-1-08 – 1-31-13

Direct cost per year \$218,750 - - Total per year \$340,625

### Completed

- Control of *Drosophila* neural development and sexual behavior by the retained gene.

Principal Investigator: Michael B. McKeown.

Agency: National Science Foundation

Type: Research Grant (IBN-0315660)

Period 9-1-03 to 8-31-06

- Nuclear Receptor and Co-Repressor Function in Eye Development

Principal Investigator: Michael B. McKeown

Agency: National Science Foundation

Type: Research Grant (IBN-9874448, Years 01-04)    Period: July 1, 1999, to June 30, 2004.

- Control of Sex-Specific Neural Development and Behavior

Principal Investigator: Michael B. McKeown

Agency: National Institute of Mental Health

Type: R01 (MH57460, Years 01-04)    Period: September 1, 1997, to April 30, 2003.

Behavioral and Neural Deterioration in *Drosophila*

Principal Investigator: Michael B. McKeown

Agency: National Institutes of Health, NIA

Type: Research Grant (1 R03 AG19614-01)    Period: October 1, 2000-September 29, 2002

Dsf co-activators and co-repressors in behavior

Principal Investigator: Michael McKeown

Agency: NSF

Type: Research Grant

Date: July 2005

### Submitted

Systems, Biology and Developmental Birth Defects

Principal Investigator: Michael McKeown

Agency: National Institute of Health, NICHD

Type: T32 Predoctoral Training Grant – 2 students year 1, 4 thereafter Systems Biology of Development and Birth Defects, Submitted Spring 2008

Howard Hughes Medical Institute Undergraduate Science Education 2010 - Core

Program Director: Michael McKeown

Agency: Howard Hughes Medical Institute

Type: Undergraduate Science Education Grant Submitted Oct 2, 2009

Requested funds: \$2.18 million over four years.

This grant, involving 13 research active faculty members, multiple administrators in both BioMed and the Dean of the College offices aims to improve science education across the campus. There are four key components: 1) A new summer research program for a total of 240 rising 2<sup>nd</sup> and 3<sup>rd</sup> year students working in collaborative, interdisciplinary groups focused one of five areas of research; 2) development of 8 new courses including a fall semester course for first year students with AP Bio credit, two computational courses for Biology Concentrators; three new science courses related to current societal issues and involving both humanities concentrators and science concentrators; and two courses focusing on scientific communication; 3) an HHMI New Scientist Program for students from under represented backgrounds interested in science, with training and activities beginning before the start of the first year and continuing through all 4 years at Brown; and 4) Professional development for faculty and future faculty (grad students and postdocs). Community outreach is woven into these aims.

### Service

#### Service activities prior to July 2000

- Service to Salk Institute:

Elected to and served two terms on the Salk Academic Council

Program Director for *Growth and Differentiation in Eukaryotes*, an NIH Training Grant supporting six graduate students at Salk.

Regular service with Institute Relations (fund raising) department, including multiple public outreach talks to potential donors and regular small group and informal meetings with donors.

- Community Service

Member of the California Mathematics Program Advisory Committee which wrote the 1996 California Mathematics Program Advisory

Member of San Diego City Schools Math Standards Committee 1997-1998

#### Service Activities July 2000 to present

##### Major Service to Brown University

Life Sciences Building Committee – Planning and consultation for a new 186,000 square foot, \$80,000,000

Life Sciences Building August 2000 to present

Assistant Director, Molecular Biology, Cell Biology and Biochemistry Graduate Program – July 2000-June 2001

Vice Chair, Molecular Biology, Cell Biology and Biochemistry – July 2001 to Dec. 31, 2005

Director, Molecular Biology, Cell Biology and Biochemistry Graduate Program – July 2001 to June 2009

Academic Liason Men's Cross Country and Track and Field - Winter 2004-present

Chairman, Admissions Committee, MCB Graduate Program - '03-'04

Interim-Chair Molecular Biology, Cell Biology and Biochemistry Department, Sept. 1 - Dec. 31, 2004.

Chair – MCB Developmental Biology Faculty Search Committee Fall 2005 to present

Member – MCB Department and Graduate Program Curriculum Committee 2005, Substantial revision of the graduate and undergraduate MCB-related curriculum

Chair – MCB Department and Graduate Program Curriculum Committee 2006-present

Member – BioMed Undergraduate Curriculum Committee 2007-present

Program Director for campus wide HHMI 2010 Undergraduate Science Education Grant 2009-

Member of the Campus Academic Code Committee – Spring 2010

#### Service to the Profession

Reviewer

Genetics, 1983-1997, 1999; Proc. Nat'l Acad. Sci. USA, 1987, 1989, 1990, 1993, 1996, 1997; 2003; Devel. Biology, 1987, 1988, 1991, 1998, 2001, 2003, 2004; Genes and Devel. 1987-1995, 1997; Science, 1990, 1992, 1993, 1999; Cell, 1990-1993, 1999, 2000; Development, 1990, 1992, 1995, 1998, 1999, 2001, 2002, 2004; EMBO J, 1996, 1997; MCB, 1990, 1992, 1994, 1996, 1997; Neuron, 1997; Development Genes and Evolution 1997; Journal of Virology 1994; Journal of Biology 2008, Mechanisms of Development, 2003; Molecular Pharmacology, 2003; NSF 1989-1993, 1995, 1996, 1998, 1999, 2000, 2002, 2003, 2005; March of Dimes, 1989; Army Breast Cancer Research Program, 1994, 1996, 1997, 1998, 1999. Evolution and Development 2004, 2005. Killian Foundation, Canada 2005, 2007 Three manuscript reviews

NIH Genetics Study Section October 1995

NIH MDCN-6 Study Section June 2003

NIH ZRG1 MDCN-A (03) Study Section March 2006

NIH ZRG1 MDCN-E (02) (M) Special Emphasis Panel/Scientific Review Group 2007/01  
December 2006.

NIH NTRC Study Section June 2007

NSF Proposal review April 2007

Invited Session Chairman

Developmental Biology Gordon Conference, 1989

Special Editor, *Developmental Genetics* special section on Sex Determination and Differentiation

### **Academic Honors, Research Grants, Fellowships, Honor Societies**

#### **Academic Honors**

Phi Beta Kappa, Spring 1974

Fox Award, Outstanding Biology Undergraduate, Spring 1975

BS with Distinction and Departmental Honors, Spring 1975

Pew Foundation Scholar in the Biomedical Sciences, July 1986

Elected Salk Institute Academic Council, May, 1989, Re-elected April 1991

#### **Fellowships**

NSF Predoctoral Fellowship, 1975-1978

NIH Predoctoral Traineeships, 1978-1981

NIH Postdoctoral Trainee, 1981-1982

Helen Hay Whitney Foundation Postdoctoral Fellow, 1982-1985

**Teaching**

Prior to July 2000

Organized and taught Bio 221A/BGGN223, Advanced Genetics for the Biology Graduate Program at UCSD, Fall 1992, Spring 1994, Spring 1995, Spring 1996, Spring 1997, Spring 1998, Spring 1999.

**Since July 2000**

Bi0154 –Molecular Genetics, Brown University, Spring 2001 – 20 students (6 undergrad, 14 grad) 50%  
Spring 2002 – 28 Students (10 undergrad, 18 grad) 100%  
Spring 2003 -- 27 students (13 undergrad, 14 grad) 100%  
Spring 2004 -- 31 students (14 undergrad, 17 grad) 50%

Bi0154 –Molecular Genetics, Pfizer Spring 2003 -- 36 students 100%

Bi047 Genetics  
Fall 2003 -- 175 students 50%  
Fall 2004 -- 175 students 50%  
Fall 2005 -- 212 students 50%  
Fall 2006 -- 204 students 50%  
Fall 2007 -- ~200 students 50%  
Fall 2009 -- ~200 students 50%

Bi0248 Current Topics in Genetics -- Molecular Biology of Sex Spring 2006 -- 5 students 50%

Bi0248 Current Topics in Genetics -- Epigenetics (Seminar) Spring 2007 -- 12 students 50%

BIOL 2490A Nuclear Hormone Receptors in Growth, Differentiation and Disease Spring 2008  
-- 6 students 50%

BIOL 2480B Dissection of Genetic and Molecular Mechanisms Spring 2009 -- 4 students 33%

Undergraduate independent study Fall 2001 – 2 students

Undergraduate independent study, Spring 2002 – 1 Student

Undergraduate independent study, Summer 2002 – 2 Students (one with the Leadership Alliance Program)

Undergraduate independent study, Fall 2002 – 1 Student

Undergraduate independent study, Summer 2003 – 1 Students

Undergraduate independent study student Summer 2004 -- 1 student (Leadership Alliance)

Undergraduate independent study student Fall 2004 -- 1 student

Undergraduate Course Development UTRA Summer 2005 – supervised 2 students

Undergraduate independent study student Summer 2005 - - 1 student

Undergraduate independent study student Summer 2005 - - 1 student

Undergraduate independent study student Fall 2005 - - 1 student

Undergraduate independent study student Spring 2006 - - 1 student

Undergraduate independent study student Summer 2008-May 2009 -- 1 student

Reader undergraduate honors theses 2004 -- 2 students

Reader undergraduate honors theses 2005 -- 2 students

Reader undergraduate honors theses 2006 -- 3 students

Reader undergraduate Honors theses 2007 -- at least 2 students

Reader undergraduate Honors theses 2008 -- at least 2 students

Reader undergraduate Honors theses 2009 – at least 3 students

Graduate Student Exam/Thesis Committees at Brown – at least 19 plus 3 UCSD

Details of teaching since 2001-2002

BI0154 Molecular Genetics 2002

28 students - 10 undergrads and 18 graduate students

Sole instructor

27 lectures - 1.5 hours each

no labs

10 graduate discussions sections per semester

BI0154 Molecular Genetics 2003

27 students - 13 undergrads and 14 graduate students

Sole instructor



27 lectures - 1.5 hours each

no labs

10 graduate discussions sections per semester

BI0154 Molecular Genetics Pfizer -2003

36 students

Sole Instructor

14 lectures - 3 hours each

No labs

Bi0047 Genetics 2003

185 students - first exam, 173 students final exam

Course leader

Shared instruction with J. Laney - also served as mentor to Dr. Laney as this was his first class taught

15/ 29 class meetings (1.5 hours)

~11 labs organized by Jody Hall

24 3 hour Genetics Clinics (two each week on weeks with homework) I attended 12 of these (36 hrs)

2 review sessions - one before each midterm

2 evening exams (3 hrs) - I attended both

Additional Notes: Dr. Laney and I completely revamped the course.

BI0154 Molecular Genetics 2004

31 students - 14 undergrads and 17 graduate students completed the course

Lead instructor

Co-taught with J. Singer (first lecture course taught)

13 of 27 lectures - 1.5 hours each

no labs

10 graduate discussions sections per semester

Bi0047 Genetics 2004

~175 students

Course leader

Shared instruction with J. Laney

14/ 27 class meetings (1.5 hours each)

~11 labs organized by Jody Hall

24 3 hour Genetics Clinics (two each week on weeks with homework) I attended 12 of these (36 hrs)

4 review sessions - one before each midterm, two before the final (I taught 2 hours in three of these)

2 evening exams (3 hrs) - I attended both

Bi0047 Genetics 2005

~212 students

Shared instruction with J. Laney

13/ 27 class meetings (1.5 hours each)

~11 labs organized by Jody Hall

24 3 hour Genetics Clinics (two each week on weeks with homework) I attended 12 of these (36 hrs)

3 review sessions - one before each midterm, one before the final (I taught 2 hours in three of these)

2 evening exams (3 hrs) - I attended both

Student Reviews for both the course and the instructor improved significantly from previous year.

Class enrollment, based on students taking the final exam, increased by more than 20%

Bi0248 Current Topics in Genetics -- Molecular Biology of Sex (Seminar) 2006

~5 students

Shared with Richard Freiman

12 class meetings, Participated in 10

Bi0047 Genetics 2006

~204 students

Lead Instructor - - Shared instruction with W. Fairbrother

14/ 27 class meetings (1.5 hours each)

~11 labs organized by Jody Hall

Genetics Clinics (10 hours per each week on weeks with homework) I attended 12 of these (36 hrs)

2 evening exams (3 hrs) - I attended both

Bi0248 Current Topics in Genetics -- Epigenetics (Seminar) Spring 2007

11 students 50% Shared with J. Laney

12 meetings, I attended all

Bi0047 Genetics 2007

~200 students

Lead Instructor - Shared instruction with W. Fairbrother

14/ 27 class meetings (1.5 hours each)

~11 labs organized by Jody Hall

Genetics Clinics (10 hours per each week on weeks with homework) I attended 12 of these (36 hrs)

2 evening exams (3 hrs) - I attended both

BIOL 2490A Nuclear Hormone Receptors in Growth, Differentiation and Disease Spring 2008

6 students

50% shared with A. Brodsky 12 meetings, I attended all meetings

BIOL 2480B Dissection of Genetic and Molecular Mechanisms Spring 2009

4 students

Shared with A. Brodsky and T. Serio, I attended all meetings

BIOL 0470 Genetics Fall 2009

~200 students

Lead Instructor – Shared instruction with Rob Reenan

13/26 class meetings, I attended nearly all of these

~11 labs organized by Jody Hall

Genetics Clinic (10 hours per week on weeks with homework). I attended 13 sessions for a total of ~37 hours

Note: I taught the entirety of the second half of the course for the first time. This portion of the course deals with topics beyond classic transmission genetics. A number of topics previously in this section have been superseded by new methods and new results. As a consequence, I initiated a revision of this portion of the course, dropping or heavily revising less relevant lectures and developing whole new lectures. This included adding lectures and problems on the use of BLAST, comparative genomics, SNPs, and association studies based on the HapMap.