

## CURRICULUM VITAE

James William Mahaffey

### Biographical Information

Birthdate: August 29, 1953, Hamilton, Ohio  
Marital Status: Married  
Mailing Address: Genetics Dept. Box 7614  
North Carolina State University  
Raleigh, NC 27695-7614  
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### Education

B.S. with High Honors in Independent Studies, 1979.  
University of Cincinnati,  
Cincinnati, OH. Thesis Advisor: Dr. Edna Kaneshiro

Ph.D in Genetics, 1984.  
The Johns Hopkins University,  
Baltimore, MD.21218 Thesis Advisor: Dr. Eric A. Fyrberg  
Thesis title: A Molecular and Genetic Approach to Actin Gene Expression in  
*Drosophila*

Postdoctoral Research, 1/1/1985 to 8/31/88.  
Program in Genetics and in Molecular, Cellular,  
and Developmental Biology.  
Biology Dept.  
Indiana University,  
Bloomington, IN. 47405  
Research Advisor: Prof. Thomas C. Kaufman  
Research Title: A Molecular and Genetic Analysis of Head Segmentation During  
*Drosophila* Embryogenesis.

### Honors and Awards:

Heekin Memorial Scholar, 1977  
WebbCleany Scholar, 1978  
Honors Program Scholar, 1978  
Phi Beta Kappa, 1978  
McKibben Medal, 1979

Graduated Summa Cum Laude with High Honors, 1979

**Professional Appointment:**

Assistant Professor Sept. 1988-June 30 1994  
Associate Professor July 1 1994-2008  
Professor July 2008-present  
Director of Graduate Programs, Program in Genetics 2014-present  
Department of Biological Sciences  
North Carolina State University  
Raleigh, NC 2769  
Associate Professor of Entomology 2009-present

Sept. 1, 1997 – Aug. 31 1998 Program Officer, Developmental Mechanisms, National  
Science Foundation, USA  
March 8 - May 26 2006, Program Officer, Developmental Mechanisms, National  
Science Foundation, USA  
June 2007, Visiting Professor Paul Sabatier University, Toulouse, France

**Professional Society Memberships:**

Genetics Society of America  
AAAS

**Professional Service:**

National Science Foundation, panelist for Developmental Mechanisms Panel  
(many years)

**Research Support:**

DuPont Fellowship, 1983-1984

National Institute of Health Postdoctoral Fellowship #F32-GM10036, 1985-1988

National Institutes of Health #2 RO1 AG01739; Genetic Control of *catalase* expression  
in *Drosophila* (7/90-6/93)

National Science Foundation #DCB-9108892; Genetic Basis of *Drosophila* Head  
Development (10/92-9/95)

National Science Foundation #IBN 95-14246; Specification of Morphogenetic Pathways  
through Differential Regulation of *Deformed* Target Genes (2/1/96-1/31/01)

National Science Foundation # IBN-0121111; SGER-A method to identify and

characterize potentially redundant genes within the *Drosophila* genome.  
(7/01/2001-6/30/2003) \$90,000

National Science Foundation # IBN-0090440; The role of zinc finger proteins during target gene activation by HOM-C proteins (2/1/01-1/31/05) \$395,003

National Science Foundation # IOB-0445540; Zinc finger proteins and functional specificity of Hox patterning (2/1/05-1/31/09) \$461,000

National Science Foundation, # IOS – 1046863, Targeting protein function in vivo using Small Interfering Proteins (SIPs) (09/10-8/31/12) \$299,537

National Science Foundation # IOS-0842201; Integration of Appendage and Hox Networks During *Drosophila* Development. (05/15/09-04/30/15) \$698,078

**Publication Biography:**

Refereed Publications:

Fyrberg, E. A., Mahaffey, J. W., Bond, B. J., and Davidson, N. (1983). Transcripts of the Six *Drosophila* Actin Genes Accumulate in a Stage and Tissue Specific Manner. *Cell* **3**, 115123.

Karlik, C. C., Mahaffey, J. W., Coutu, M. D., and Fyrberg, E. A. (1984). Organization of Contractile Protein Genes within the 88F Subdivision of the *Drosophila melanogaster* Third Chromosome. *Cell* **7**, 469481.

Mahaffey, J. W., Coutu, M. D., Fyrberg, E. A., and Inwood, W. (1985). The Flightless *Drosophila* Mutant *raised* has Two Distinct Genetic Lesions Affecting Accumulation of Myofibrillar Proteins in Flight Muscles. *Cell* **40**, 101110.

Mahaffey, J. W., and Kaufman, T. C. (1987). Distribution of the *Sex combs reduced* Gene Products in *Drosophila melanogaster*. *Genetics* **117**, 5160.

Mahaffey, J. W., Diederich, R., and Kaufman, T. C. (1989). Novel Patterns of Homeotic Protein Accumulation in the Head of the *Drosophila* Embryo. *Development* **105**, 167-174.

Mahaffey, J. W., Griswold, C. M., and Matthews, A. L. (1993). Molecular Genetic Mechanisms in Oxidative Damage and Aging. *Toxicology and Industrial Health* **9**, 215-222.

Mahaffey, J. W., Jones, D. F., Hickel, J. A. and Griswold, C. M. (1993). Identification and characterization of a gene activated by the deformed homeoprotein.

*Development* **118**, 203-214.

- Griswold, C. M., Matthews, A. L. Bewley, K. E. and Mahaffey, J. W. (1993). Molecular characterization and rescue of acatalasemic mutants of *Drosophila melanogaster*. *Genetics* **134**, 781-788.
- Mohler, J., Mahaffey, J. W., Deutsch, E. and Vani, K. (1995). Control of *Drosophila* head segment identity by the bZIP homeotic gene *cnc*. *Development* **121**, 237-247.
- Pederson, J. D., Kiehart, D. P. and Mahaffey, J. W. (1996). The role of HOM-C genes in segmental transformations: reexamination of the *Drosophila Sex combs reduced* embryonic phenotype. *Developmental Biology* **180**, 131-142.
- Fyrberg, C., Becker, J., Barthmaier, P., Mahaffey, J. and Fyrberg, E. (1997). A *Drosophila* muscle-specific gene related to the mouse quaking locus. *Gene* **197**, 315-323.
- Fyrberg, C., Becker, J., Barthmaier, P., Mahaffey, J. and Fyrberg, E. (1998) A family of *Drosophila* genes encoding quaking-related maxi-KH domains. *Biochemical Genetics* **36**, 51-64.
- Brown, S., Mahaffey, J. P., Lorenzen, M., Denell, R. and Mahaffey, J. W. (1999) Using RNAi to investigate orthologous homeotic gene function during development of distantly related insects. *Evol. Dev.* **1**: 11-15.
- Pederson, J.A., LaFollette, J.W., Gross, C., Veraksa A., McGinnis, W. and Mahaffey J.W. (2000) Regulation by Homeoproteins: A Comparison of Deformed-Responsive Elements *Genetics* **156**: 677-686.
- Mahaffey, J. W., Griswold, C. M. and Cao, Q. M. (2001) The *Drosophila* genes *disconnected* and *disco*-related are redundant with respect to larval head development and accumulation of mRNAs from deformed target genes. *Genetics*. **157**: 225-236.
- Robertson L.K., Dey, B.K., Campos A.R. and Mahaffey, J.W. (2002) Expression of the *Drosophila* gene *disconnected* using the UAS/GAL4 system. *Genesis*; **34**: 103-106.
- Robertson, L. K., Bowling, D. B., Mahaffey, J. P., Imiolczyk, B. and Mahaffey, J. W. (2004). An interactive network of zinc finger proteins contributes to regionalization of the *Drosophila* embryo and establishes the domains of HOM-C protein function. *Development*; **131**: 2781-2789.

- Mahaffey, J.W. (2005) Assisting Hox proteins in controlling body form: are there new lessons from flies (and mammals)? *Curr Opin Genet Dev.* **15**:422-429.
- Patel, M, Farzana, L., Robertson, L.K., Hutchinson, J., Grubbs, N., Shepherd, M.N., and Mahaffey, J.W. (2007) The appendage role of insect *disco* genes and possible implications on the evolution of the maggot larval form. *Developmental Biology* **309**: 59-69.
- Sanders, L.R. Patel, M., and Mahaffey J.W. (2008) The *Drosophila* gap gene *giant* has an anterior segment identity function mediated through *disconnected* and *teashirt*. *Genetics.* **179**: 441-453.
- Dworkin, I., Kennerly, E., Tack, D. Hutchinson, J., Brown, J. Mahaffey, J. and Gibson, G. (2009) Genomic consequences of background effects on scalloped mutant expressivity in the wing of *Drosophila melanogaster*. *Genetics* **181**: 1065-1076.
- Grubbs, N., Leach, M., Su. X., Petrisko, T., Rosario, J.B. and Mahaffey, J.W. (2013) New components of *Drosophila* leg development identified through Genome Wide Association Studies PLoS One. **8**(4):e60261.
- Heffer, A., Grubbs, N., Mahaffey, J. and Pick, L. (2013), The evolving role of the orphan nuclear receptor *ftz-fl*, a pair-rule segmentation gene. *Evolution & Development*, **15**: 406–417. (Note: Alison Heffer and Nathaniel Grubbs, contributed equally to this work.)
- Non-refereed:  
On BioRxiv  
Rosario J. and Mahaffey, J. (2016). The *Drosophila* genes *disconnected* and *disco*-related together specify development of adult legs **doi: <http://dx.doi.org/10.1101/052811>**
- Book Review:  
Mahaffey, J. W. and Dworkin, I. Review of Lewis Held's Imaginal Discs for the journal, *Genetical Research* **87**; 219
- Books and Book Chapters:  
Fyrberg, E. A., Mahaffey, J. W., Karlik, C. C., and Coutu, M. D. (1986). Genetic and Molecular Analysis of *Drosophila* Actin Gene Function. In Molecular Biology of Muscle Development eds. C.P. Emerson, Jr. et al., UCLA Symposia on Molecular and Cellular Biology, New Series, Alan R. Liss, N.Y. vol **29**, 639652.

- Mahaffey, J. W., and Kaufman, T. C. (1988). The Homeotic Genes of the AntennapediaComplex and the BithoraxComplex of *Drosophila* In, Developmental Genetics of Animals and Plants, (G. M. Malacinski ed.), MacMillan Publishing Co., N. Y. 329-360.
- Robertson, L.K., and Mahaffey, J.W. (2005). Insect HOM-C genes and development-Lessons from *Drosophila* and beyond. In *Comprehensive Insect Physiology, Biochemistry, Pharmacology, and Molecular Biology-Reproduction and Development* (eds., L.I. Gilbert, K. Iatrou, and S. Gill) Elsevier Limited, London, UK.
- Submitted -- Mahaffey, J.W (2016) Update to Robertson, L.K., and Mahaffey, J.W. (2005). Insect HOM-C genes and development-Lessons from *Drosophila* and beyond. In *Comprehensive Insect Physiology, Biochemistry, Pharmacology, and Molecular Biology-Reproduction and Development* (eds., L.I. Gilbert, K. Iatrou, and S. Gill) Elsevier Limited, London, UK.