

## CURRICULUM VITAE

# HAROLD BURGESS DOWSE

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### **Educational Experience:**

B.A. Amherst College 1966  
Ph.D. New York University 1971

### **Professional Experience:**

Faculty of The Graduate School, University of Maine 1986-date  
Professor of Biological Sciences, University of Maine 1997-date  
Cooperating Professor of Mathematics and Statistics 1997-date  
Cooperating Professor of Bioresource Engineering 2000-date  
Associate Professor of Zoology, University of Maine 1990-1997  
Assistant Professor of Zoology, University of Maine 1986-1990  
Cooperating Associate Professor of Mathematics,  
University of Maine 1993-1997  
Instructor of Zoology, University of Maine 1979-1986  
Chief Graduate Assistant, New York University 1969-1971  
Research Assistant, New York University 1968-1970  
Graduate Teaching Assistant, New York University 1967-1971  
Professor Emeritus 2015...

### **Administrative Experience**

Graduate Committee 1993-1996  
Director, Biomedical Research Support Group (NIH) 1992-1995  
Chair, Health Professions Committee 1991-1999  
Chair, Department Peer Committee 1991-1993,  
1996-1997  
Chair, Department Undergraduate Curriculum Committee 1991-1997  
Chief Graduate Program Coordinator 1995-1996  
Curriculum coordinator for the statewide Ph.D. program 1999-2000  
Chief Graduate Program Coordinator 2003-2005  
Coordinator, Clinical Laboratory Sciences Program 2005-2009  
Associate Director, School of Biology and Ecology 2009-2012

### **Professional Societies:**

American Association for the Advancement of Science, Sigma Xi,  
American Society for Cell Biology, Maine Chapter, Society for  
Neuroscience

### **Refereed Publications and Manuscripts In Press, In Review, or In Preparation:**

- Dowse, H.B. and J.D. Palmer. 1969. Entrainment of circadian activity rhythms in mice by electrostatic fields. *Nature*, 222: 564-566.
- Dowse, H.B. and J.D. Palmer. 1972. The chromomutagenic effect of deuterium oxide on the period and entrainment of a biological rhythm. *Biol. Bull.* 143:513-524.
- Dowse, H.B. 1982. The effects of phase shifts in a 10Hz electric field cycle on the locomotor activity rhythm of *Drosophila melanogaster*. *J. Interdisciplinary Cycle Res.*, 13: 257-264.
- Gustafson-Marjanen, K.-I. and H.B. Dowse. 1983. Seasonal and diel patterns of emergence from the redd in Atlantic Salmon fry (*S. salar* L.). *Can. J. Fish. Aquat. Sci.*; 40: 813- 817.
- Shick, J.M. and H.B. Dowse. 1985. Genetic basis of physiological variation in natural populations of sea anemones: Intra and Interclonal analyses of variance. *Proc. of the IXX Biol. Symposium*. P.E. Gibbs, ed. 465-479.
- Ringo, J.M., D. Wood, R. Rockwell and H.B. Dowse. 1985. An experiment testing two hypotheses of speciation. *Am. Naturalist*, 126: 642-661.
- Ringo, J., H. Dowse and K. Barton. 1986. The effect of genetic drift on mating propensity, courtship behaviour, and postmating fitness in *Drosophila simulans*. *Behaviour*, 97: 226-233.
- Dowse, H.B., J.M. Ringo and K.M. Barton. 1986. A model describing the kinetics of mating in *Drosophila*. *J. Theor. Biol.*, 121: 173-183.
- Ringo, J.M., H.B. Dowse and S. Lagasse. 1986. Symmetry versus asymmetry in sexual isolation experiments. *Evolution*, 40: 1071-1083.
- Ringo, J.M. and H.B. Dowse. 1986. Genetic Variation in *Drosophila melanogaster* for the life-shortening effects of random lighting regimes. *J. Exp. Zool.*, 239: 87-96.
- Ringo, J., H. Dowse and K. Barton. 1987. Courtship behavior and the kinetics of mating in three lines of *Drosophila simulans* and their hybrids. *Behav. Genet.*, 17: 141-154.
- Dowse, H.B., J.C. Hall and J.M. Ringo. 1987. Circadian and ultradian rhythms in period mutants of *Drosophila melanogaster*. *Behav. Genet.* 17: 19-35.

- Ringo, J., H. Dowse and S. Lagasse. 1987. Inbreeding decreases mating propensity and productivity in *Drosophila simulans*. *J. Hered.*, 78: 271-272.
- Dowse, H. and J. Ringo. 1987. Further evidence that the biological clock in *Drosophila* is a population of coupled ultradian oscillations. *J. Biol. Rhythms*, 2: 65-76.
- Dowse, H.B. and J.M. Ringo. 1989. Rearing *Drosophila* in constant darkness produces phenocopies of *period* circadian clock mutants. *Physiol. Zool.* 62:785-803.
- Dowse, H.B. and J.M. Ringo. 1989. The search for hidden periodicities in biological time series revisited. *J. Theor. Biol.* 139: 487-515.
- Hamblen-Coyle, M., R.J. Konopka, L.J. Zwiebel, H.V. Colot, H.B. Dowse, M.R. Rosbash, and J.C. Hall. 1989. A new mutation at the *period* locus of *Drosophila melanogaster* with some novel effects on circadian rhythms. *J. Neurogenet.* 5: 229-256.
- Dowse, H.B., M.S. Dushay, J.C. Hall, and J.M. Ringo. 1989. High resolution analysis of locomotor activity rhythms in *disconnected*, a visual system mutant of *Drosophila melanogaster*. *Behav. Genet.* 19: 529-542.
- Dowse, H.B. and J.D. Palmer. 1990. Evidence for ultradian rhythmicity in an intertidal crab. In: Hayes, D.K., Pauly, R., and R. Reiter (eds.) *Progress in Clinical and Biological Research, Vol 341B. Chronobiology: Its Role in Clinical Medicine, General Biology and agriculture, Part B.* Wiley-Liss, New York. 691-697.
- Chess, K.F., J.M. Ringo, and H.B. Dowse. 1990. Oviposition by two species of *Drosophila*: Resource distribution and competition. *Ann. Entomol. Soc. of America.* 83: 717-724.
- Dowse, H.B. and J.M. Ringo. 1991. Comparisons between "periodograms" and spectral analysis: Apples are apples after all. *J. Theoret. Biol.*, 148: 139-144.
- Newby, L., L. White, S. DiBartolomeis, B. Walker, H. Dowse, J. Ringo, N. Khuda, and F.R. Jackson. 1991. Mutational analysis of the *Drosophila miniature-dusky (m-dy)* locus: Effects on cell size and circadian rhythms. *Genetics*, 128: 571-582.
- Tenriero, S. H. Dowse, S. D'Souza, D.S. Minors, M. Chiswick, D. Simms, and J.M. Waterhouse. 1991. Rhythms of temperature and heart rate in premature babies in intensive care. *Early Human Development*, 27: 33-52
- White, L. J. Ringo, and H. Dowse. 1992. The effects of Deuterium Oxide and temperature on heart rate in *Drosophila*. *J. Comp. Physiol. B*, 162, 278-283.
- White, L., J. Ringo, and H. Dowse. 1992. A circadian clock of *Drosophila*: Effects of Deuterium Oxide and mutations at the *period* locus. *Chronobiology International*, 9:250-259.

- Dowse, H.B. and J.D. Palmer. 1992. Comparative studies of tidal rhythms. XI. Ultradian and circalunidian rhythmicity in four species of semiterrestrial, intertidal crabs. *Mar. Behav. Physiol.*, 21: 105-119.
- Dowse, H.B. and J.M. Ringo. 1994. Summing locomotor activity into "bins": How to avoid artifact in spectral analysis. *Biol. Rhythm Research*, 25: 2-14.
- Sawyer, S., H.B. Dowse, and J.M. Shick. 1994. The neurophysiological correlates of the behavioral response to light in the sea anemone *Anthopleura elegantissima*. *Biological Bulletin*, 186: 195-201.
- Palmer, J.D., B.G. Williams, and H.B. Dowse. 1994. The statistical analysis of tidal rhythms: Tests of the relative effectiveness of five methods using model simulations and actual data. *Mar. Behav. Physiol.*, 24: 165-182.
- Sawin, E., H.B. Dowse, M. Hamblen-Coyle, J.C. Hall, and M.B. Sokolowski. 1994. A lack of locomotor activity in *Drosophila melanogaster* larvae (Diptera: Drosophilidae). *J. Insect Behav.*, 7: 249-262.
- Power, J., J.M. Ringo, and H.B. Dowse. 1995. The role of light in the initiation of circadian rhythmicity of adult *Drosophila melanogaster*. *J. Neurogenet.*, 9: 227-238.
- Power, J., J.M. Ringo, and H.B. Dowse. 1995. The effects of *period* mutations and light on the activity rhythms of *Drosophila melanogaster*. *J. Biol. Rhythms*, 10: 267-280.
- Dowse, H.B., J.M. Ringo, J. Power, E. Johnson, Kurt Kinney, and L. White. 1995. A congenital heart defect in *Drosophila* caused by an action potential mutation. *J. Neurogenet.*, 10: 153-168.
- Johnson, E., J. Ringo, and H. Dowse. 1997. Modulation of *Drosophila* heartbeat by neurotransmitters. *J. Comp. Physiol. B.*, 167: 89-97.
- Kerr, C. J. Ringo, H. Dowse, and E. Johnson. 1997. *Icebox*, a recessive sex-linked mutation in *Drosophila* causing low sexual receptivity. *J. Neurogenet.*, 11: 213-229.
- Plautz, J., M. Straume, R. Stanewsky, C. Jamison, C. Brandes, H. Dowse, J. Hall, and S. Kay. 1997. Quantitative analysis of *Drosophila period* gene transcription in living animals. *J. Biol. Rhythms*, 12: 204-217.
- Johnson, E., J. Ringo, N. Bray, and H. Dowse. 1998. Genetic and pharmacological identification of ion channels central to *Drosophila's* cardiac pacemaker. *J. Neurogenet.*, 12: 1-24.
- Roche, J., B. Talyn, and H. Dowse. 1998. Courtship duration in *per* circadian period mutants of *Drosophila melanogaster*. *Behavior Genetics*, 28: 391-394.
- Alt, S., J. Ringo, B. Talyn, W. Bray, and H. Dowse. 1998. The period gene controls courtship song cycles in *Drosophila melanogaster*. *Anim. Behav.* 56: 87-97.

- Lindsley, G., H. Dowse, P. Burgoon, M. Kilka, and L. Stephenson. 1999. A persistent circadian ultradian rhythm is identified in human core temperature. *Chronobiology International*, 16: 69-78.
- Curtis, N., J. Ringo, and H. Dowse. 1999. Morphology of the pupal heart, adult heart, and associated tissues in the fruit fly (*Drosophila melanogaster*). *J. Morphol.* 240: 225-235.
- Johnson, E. J. Ringo, and H. Dowse. 2000. Native and heterologous neuropeptides are cardioactive in *Drosophila melanogaster*. *J. Insect Physiol.* 46: 1229-1236.
- Klevecz, R. and H. Dowse. 2000. Tuning the transcriptome. *Cell Proliferation*, 33: 209-218.
- Dowse, H. S. Norton, and B. Sidell. 2000. The estimation of the diffusion constant and solubility of O<sub>2</sub> in tissue using kinetics. *J. Theoret. Biol.*, 207: 531-541.
- Johnson, E., J. Ringo, and H. Dowse. 2001. Dynamin, encoded by the gene *shibire*, is essential for cardiac function. *J. Exp. Zool.*, 289: 81-89.
- Krishnan, B., J. Levine, K. Sisson, H. Dowse, P. Funes, J. Hall, P. Hardin, and S. Dryer. 2001. A new role for cryptochrome in a *Drosophila* circadian oscillator. *Nature*, 411: 313-317.
- Talyn, B. and Dowse, H. 2001. FORTRAN Program Generates Artificial Courtship Song. *Animal Behavior Society Newsletter*, November.
- Johnson, E. T. Sherry, J. Ringo, and H. Dowse. (2002) Modulation of the cardiac pacemaker of *Drosophila*: Cellular Mechanisms. *J. Comp. Physiol. B.* 172: 227-236.
- Levine, J., Funes, P., Dowse, H., and Hall, J. 2002. Signal Analysis of Behavioral and Molecular Cycles. *Biomed. Central. Neurosci.* 3: 1.
- Levine, J., P. Funes, H. Dowse, and J. C. Hall. 2002. Advanced analysis of a *cryptochrome* mutation's effects on the robustness and phase of molecular cycles in isolated peripheral tissues of *Drosophila*. *Biomed. Central Neurosci.* 3: 5.
- Levine, J.D., P. Funes, H.B. Dowse, and J.C. Hall. 2002. Social experience influences circadian timing in *Drosophila melanogaster*. *Science.* 298: 2010-2012.
- Talyn, B. and H. Dowse. 2004. The role of courtship song in sexual selection and species recognition by female *Drosophila melanogaster*. *Animal Behaviour.* 68: 1165-1180.
- Ray, V. and H. Dowse. 2005. Mutations in the Ca<sup>2+</sup> channel-encoding gene *cacophony*, which affect courtship song in *Drosophila*, have novel effects on heartbeating. *J. Neurogenet.*, 19: 39-56.

- Sanyal, S., T. Jennings, H. Dowse, and M. Ramaswami. 2005. Conditional mutations in SERCA, the Sarco-endoplasmic reticulum  $\text{Ca}^{2+}$ -ATPase, alter heart rate and rhythmicity in *Drosophila*. *J. Comp. Physiol. B.* 176: 253-263.
- Gaten E., Tarling, G., Dowse, H., Kyriacou, C. and Rosato, E. 2008. Is vertical migration in Antarctic krill (*Euphausia superba*) influenced by an underlying circadian rhythm? *J. Genetics*, 87: 473-483.
- Jennings, T., J. Ringo and H. Dowse. 2009. The relationship of heart function to temperature in *Drosophila melanogaster* and its heritability. *J Exp. Zool.* 311A: 689-696.
- Dowse, H., J. Umemori, and T. Koide. 2010. Ultradian Components in the Locomotor Activity Rhythms of the Genetically Normal Mouse, *Mus musculus*. *J. Exp. Biol.*, 213: 1788-1795.
- Gaten E., S.J. Huston, H.B. Dowse and T. Matheson. 2012. Solitary and Gregarious Locusts Differ in Circadian Rhythmicity of a Visual Output Neuron. *J Biol Rhythms* 27: 196-205.
- Ringo, J. and H. Dowse. 2012. Pupation Site Selection in Four Drosophilid Species: Aggregation and Contact. *J. Insect Behavior.* 25: 578-589.
- Vrailas-Mortimer, Alysia, Gomez, Rosy, Dowse, Harold, Sanyal, Subhabrata. 2012. A Survey of the Protective Effects of Some Commercially available antioxidant supplements in genetic and chemically induced models of oxidative stress in *Drosophila melanogaster*. *Experimental Gerontology.* 47(9):712-22 Winner, "Outstanding Paper" award, 2012
- Stephenson, R., Joonbum Lim, Svetlana Famina, Aimee M. Caron, and Harold B. Dowse. 2012. Sleep-Wake Behaviour in the Rat: Ultradian Rhythms in a Light-Dark Cycle and Continuous Bright Light. *Journal of Biological Rhythms.* 27: 490-501
- Dominoni, D., Helm, B., Lehmann, M., Dowse, H., Partecke, J. 2013. Clocks for the city: circadian differences between forest and city songbirds. *Royal Society, Proceedings.* B: 280:1-8.
- Dowse, H.B. 2013. Maximum Entropy Spectral Analysis for Circadian Rhythms: Theory, History and Practice. *J. Circadian Rhythms*, 11: 6-14.

- Vrailas-Mortimer, A., Gomez, R., Dowse, H, and Sanyal, S. 2012. A survey of the protective effects of some commercially available antioxidant supplements in genetically and chemically induced models of oxidative stress in *Drosophila melanogaster*. *Experimental Gerontology*, 47:712-722. Awarded Best Paper of the Year in the journal.
- Vrailas-Mortimer Alysia, Sarah M. Ryan, Matt Avey, Harold Dowse and Subhabrata Sanyal. 2014. p38 MAP Kinase regulates circadian rhythms in *Drosophila*. *J. Biol. Rhythms*, 29: 411–426.
- VanKirk T, Powers E, Dowse, HB. 2016. Melatonin increases the regularity of cardiac rhythmicity in the *Drosophila* heart in both wild-type and strains bearing pathogenic mutations. *J Comp Physiol B*, 187(1): 63-78  
doi:10.1007/s00360-016-1019-8
- Beasley, V and H.B. Dowse. (2016) Suppression of Tryptophan 2,3-Dioxygenase Produces a Slow Heartbeat Phenotype in *Drosophila melanogaster*. *J. Exp. Zool. A*, 325: 651-664.
- Kyriacou, C.P, E.W. Green, A. Piffer, and H.B. Dowse. (2017) Failure to reproduce *period*-dependent song cycles in *Drosophila* is due to poor automated pulse-detection and low intensity courtship. *PNAS*. 114: 1970-1975.
- Gaitanidis, A., Dimitriadou, A.,<sup>1</sup> Dowse, H. Sanyal, S., Duch, C., and Consoulas, C. 2019. Longitudinal assessment of health-span and pre-death morbidity in wild type *Drosophila*. *Aging (Albany NY)*, 11(6): 1850–1873.
- Dowse H., and T. VanKirk. 2022. *Drosophila* as a Model System for Cardiology: The Case of Melatonin and Heartbeat Regularity. *Medical Research Archives*, 10 ISSN 2375-1924 <https://esmed.org/MRA/mra/article/view/2808>
- Dowse H. and T. VanKirk. 2023. Communication Between the Plasma Membrane and Cytosolic Cardiac Pacemakers: A Role for Melatonin?, *Medical Research Archives*, [online] 11(2). <https://doi.org/10.18103/mra.v11i2.3582>
- Chen, X., Xu, T. Dowse, H., Tao, Y, Zeng, C, and Zhao, F. 2023. Correlation between transport and moulting of catadromous crab megalopae: The effects of starvation on rhythmic vertical migration. *Marine and Freshwater Behaviour and Physiology*. Online: <https://doi.org/10.1080/10236244.2023.2171876>

**Book chapters, monographs, books, review articles:**

- Dowse, H.B., and J.M. Ringo. 1992. Do ultradian oscillators underlie the circadian clock in *Drosophila*. In: D.L. Lloyd, and E. Rossi (eds.) *Ultradian Rhythmicity in Biological Systems: An Inquiry into Fundamental Principles*. Springer Verlag. pp. 105-117.
- Dowse, H.B., and J.M. Ringo. 1993. Is the Biological clock a metaoscillator? In: Young, (ed.) *Molecular approaches to circadian rhythms*. Dekker, NY. pp. 195-220.
- Dowse, H.B., and E. Groden. (eds.) 1998. *Biology: the Living Science*. Simon and Schuster. 1248 pp.
- Bodmer, R., R.J. Wessels, E. Johnson, and H. Dowse. 2005. Heart development and function. *Comprehensive Molecular Insect Science*. L.I. Gilbert, K. Iatrou and S. Gill, eds., V 2, Elsevier.
- Dowse, H. 2007. Statistical analysis of biological rhythm data. *Methods in Molecular Biology: Circadian Rhythms*. E. Rosato, ed. 362:29-45. Humana Press.
- Dowse, H.B. 2008. Mid-range ultradian rhythms in *Drosophila* and the circadian clock problem. In: D.L. Lloyd, and E. Rossi (eds.) *Ultradian Rhythms from Molecules to Mind: A New Vision of Life*. Springer Verlag.
- Dowse, H.B. 2009. Analyses for physiological and behavioral rhythmicity. In: Michael L. Johnson and Ludwig Brand, Eds. *Methods in Enzymology, Computer Methods, Part A*. 454: 141- 174. Elsevier.
- Bodmer, R., R.J. Wessels, E. Johnson, V. Beasley and H. Dowse. 2016. Heart development and function. *Comprehensive Molecular Insect Science*. L.I. Gilbert, K. Iatrou and S. Gill, eds., V N, Elsevier.

### **Videos:**

- Tyler, M., J. Schnetzer, and D. Tartaglia. (1996) *The Lives of a Fly*. A 40 minute instructional video. Sinauer, Sunderland. I provided technical, bibliographic, and background assistance for two of the segments. The video features some of the work in our laboratory. I was co-PI on the grant that funded the work.

### **Abstracts:**



- Palmer, J.D. and H.B. Dowse. 1970. Preliminary findings on the effects of D<sub>2</sub>O on the period of circadian activity rhythms. *Biol. Bull.* 137: 388.
- Dowse, H.B. 1981. Extremely low frequency electric fields affect *Drosophila* locomotor activity rhythms. *Proceedings of the Maine Biomedical Science Symposium*, 7: 29.
- Dowse, H.B. 1982. The phase response of *Drosophila* to 10Hz electric fields. *Proc. of the Maine Biomedical Science Symposium*. 8: 24.
- Gustafson-Marjanen, K.-I. and H.B. Dowse. 1982. Timing of Atlantic salmon (*Salmo salar* L.) fry emergence: seasonal and diel patterns. *Proc. Maine Biomedical Science Symposium*, 8: 14.
- Dowse, H.B. 1983. Evidence for two oscillators acting to control *Drosophila* activity. *Proc. Maine Biomedical Sci. Symp.*, 9: 32.
- Dowse, H.B., J. Ringo and K. Barton. 1984. A mathematical model of mating kinetics. *Behavior Genetics*, 14: 600.
- Dowse, H.B., J.M. Ringo and K. Barton. 1984. Second order kinetics of mating in *Drosophila*. *Proceeding of the Maine Biomedical Sciences Symposium*, 10: 36.
- Ringo, J.M. and H.B. Dowse. 1984. "Jet Lag" in *Drosophila*. *Proc. of the Maine Biomedical Sciences Symp.*, 10: 31.
- Shick, J.M. and H.B. Dowse. 1984. Genetic basis of physiological variation in natural populations of sea anemones: Intra and interclonal analyses of variance. 19th European Marine Biology Symposium.
- Ringo, J.M. and H. Dowse. 1984. Freerunning circadian activity in period mutants of *Drosophila melanogaster*. *Genetics*, 110: 560.
- Chess, K., H. Dowse and J. Ringo. 1987. Distinguishing the eggs of *D. melanogaster* and *D. simulans*. *Drosophila Information Service*, 66: 166.
- Ringo, J. and H. Dowse. 1987. Phenocopies of *period* mutants produced by light deprivation of wild-type *Drosophila*. *Behavior Genetics*, 17: 636-637.
- Ringo, J., H. Dowse and D. Jucovics. 1987. Abnormal circadian rhythms in light deprived *Drosophila*. *Proc. of the Maine Biological and Medical Sciences Symposium*, 13: 33.
- Dowse, H., J. Ringo and D. Jucovics. 1987. The effect of temperature shifts upon the endogenous activity rhythms of *Drosophila* mutant for the sex linked period gene. *Proc. of the Maine Biological and Medical Sciences Symposium*, 13: 33.
- Dowse, H.B., L. Kass and J. Ringo. 1987. Close parallels between puparial heart rate and circadian rhythms in clock mutants of *Drosophila*. *Proceedings of the 2nd Cold Spring Harbor Conference on the Molecular Neurobiology of Drosophila*.

- Dowse, H., L. Kass, and J. Ringo. 1988. Studies on a congenital heart defect in *Drosophila*. Proc. of the Maine Biomedical Science Symposium, 14: 27.
- Ringo, J., and H. Dowse. 1988. New clock mutants in *Drosophila*. Proc. of the Maine Biomedical Science Symposium, 14: 27.
- Ringo, J. and H. Dowse. 1988. *Dusky*<sup>73</sup>, a new clock mutant in *Drosophila melanogaster*. Behav. Genet. 18:714-715.
- Dowse, H., L. Kass and J. Ringo. 1988. Studies on a congenital heart defect in *Drosophila*. Behav. Genet. 18:729-730.
- Dowse, H.B., and J.D. Palmer. 1989. Evidence for ultradian rhythmicity in an intertidal crab. Chronobiologia 26:130.
- Jackson, F.R., L. Newby, B. Walker, S. DiBartolomeis, L. White, H. Dowse, and J. Ringo. 1991. Genetic and phenotypic complexity at the *dusky* locus: Mutations affecting circadian rhythms and wing morphology. Genetics Society of America Proceedings.
- Dowse, H.B., L. White, and J.M. Ringo. 1991. Deuterium lengthens the period of circadian rhythms in clock mutants of *Drosophila*. Behav. Genet.
- White, L., J. Ringo, and H. Dowse. 1991. Clock mutations at the *dusky* locus of *Drosophila*. Proc. of the Maine Biomedical Sciences Symposium. 16: 26.
- White, L., H. Dowse, and J. Ringo. 1990. Freerunning circadian period in *Drosophila period* mutants is lengthened linearly by heavy water. Proc. Maine Biomedical Sciences Symposium. 16: 34.
- Ringo, J.M., and H.B. Dowse. 1991. A temperature-sensitive neurological mutation affects heartbeat in *Drosophila melanogaster*. Behavior Genetics, 21: 590.
- Tenriero, S. H. Dowse, S. D'Souza, D.S. Minors, and J.M. Waterhouse. 1991 Rhythms of heart rate in premature babies in intensive care. Chronobiologia.
- Morrison, D., H. Dowse, and L. Kass. 1992. Temperature-compensation and occasional overcompensation of circadian rhythmicity in the *Limulus* visual system. Proc. of the Maine Biomedical Sciences Symposium.
- Tyler, M.S., J. Watler, H. Dowse, and J. Ringo. 1992. Expression of the *apterous* gene in *Drosophila melanogaster* Biological Bulletin.
- Tyler, M., J. Ringo, and H. Dowse. 1992.  $\beta$ -Galactosidase staining in axenic cultures of *Drosophila* carrying a *lac-z* insert on a *per*-gene promoter. Biological Bulletin.
- Dowse, H., William Bray, Erik Johnson, and John Ringo. 1995. Wavelet Analysis of Heartbeat in *Drosophila*. Proceedings of the Maine Biomedical Sciences Symposium, 21: 4.
- Johnson, Erik, John Ringo, and Harold Dowse. 1995. A neurological mutation that produces heart arrhythmia. Proc. Maine Biomedical Sciences Symposium, 21: 4.

- Pregger, Becky, John Ringo, and Harold Dowse. 1995. Components of *Drosophila* mating song. Proc. Maine Biomedical Sciences Symposium, 21: 12.
- Dowse, Harold B. and W. Bray. 1995. Wavelet analysis of activity rhythms of tidal organisms reveals their time-frequency structure. Biol. Rhythm Res. 26: 384.
- Talyn, B., J. Ringo, and H. Dowse. 1997. Sexual isolation in *Drosophila*: How they know who's from the right side of the tracks. Animal Behavior Society Meetings, University of Wisconsin, Madison.
- Johnson, E., N. Bray, J. Ringo, and H. Dowse. 1997. Molecular dissection of the cardiac pacemaker of *Drosophila melanogaster*. 47<sup>th</sup> annual Maine Scientific Session, Maine cardiovascular Research Network, American Heart Association. Newry, ME 26 April, 1997, 13.
- Talyn, B., J. Ringo, and H. Dowse. 1998. Genetic variation in courtship behavior by *D. melanogaster* males towards other species of females Proc. 39<sup>th</sup> Annual *Drosophila* Research Conference, c570.
- Johnson, E., J. Ringo, and H. Dowse. 1998. Electrocardiogram analysis of heartbeat. Proc. 39<sup>th</sup> Annual *Drosophila* Research Conference, a102.
- Dowse, H., E. Johnson, and J. Ringo. 1998. Dissection of the cardiac pacemaker. Proc. 39<sup>th</sup> Annual *Drosophila* Research Conference, 18.
- Tabone, M. E. Johnson, H. Dowse, H LaVoie, P. Ruben, and L. Kass. 1999. Reconstituting an action potential in frog eggs. Transactions of the MBSS, Jackson Laboratory, Bar Harbor, ME.
- Johnson, E. and H. Dowse. 1999. Construction of an ionic oscillator in *Xenopus* oocytes. Transactions of the MBSS, Jackson Laboratory, Bar Harbor, ME.
- Dowse, H. E. Johnson, and J. Ringo. 1999. The *Drosophila* cardiac pacemaker. Transactions of the MBSS, Jackson Laboratory, Bar Harbor, ME.
- Beasley, V. and H. Dowse. 2014. Disruption of the Kynurinine Pathway Modulates Heartbeat in *Drosophila melanogaster*. Maine chapter of Society for Neuroscience meeting, Orono, ME.

## **Invited Seminars and Symposium Papers**

### **Symposium Papers**

- Dowse, H.B. 1981. "Extremely low frequency electric fields affect *Drosophila* locomotor activity rhythms." Maine Biomedical Science Symposium, University of Southern Maine, Gorham.

- Dowse, H.B. 1982. "The phase response of *Drosophila* to 10Hz electric fields." Maine Biomedical Science Symposium, University of Maine, Farmington.
- Gustafson-Marjanen, K.-I. and H.B. Dowse. 1982. "Timing of Atlantic salmon (*Salmo salar* L.) fry emergence: seasonal and diel patterns." Proc. Maine Biomedical Science Symposium, University of Maine, Farmington.
- Dowse, H.B. 1983. "Evidence for two oscillators acting to control *Drosophila* activity." Maine Biomedical Science Symposium, Colby College, Waterville, Maine.
- Shick, J.M. and H.B. Dowse. 1984. "Genetic basis of physiological variation in natural populations of sea anemones: Intra and interclonal analyses of variance." 19th European Marine Biology Symposium, Plymouth, England.
- Dowse, H., J. Ringo, and K. Barton. 1984. "A mathematical model of mating kinetics." Annual meeting of the Behavior Genetics Association, Indiana University, Bloomington.
- Dowse, H. J. Ringo, and K. Barton. 1984. "Second order kinetics of mating in *Drosophila*." Maine Biomedical Science Symposium, University of Maine, Orono.
- Ringo, J.M. and H. Dowse. 1984. "Freerunning circadian activity in period mutants of *Drosophila melanogaster*." Annual Meeting of the Genetics Society of America, Boston University.
- Ringo, J., and H. Dowse. 1984. "'Jet Lag' in *Drosophila*." Maine Biomedical Science Symposium, University of Maine, Orono.
- Dowse, H.B., and J.M Ringo. 1985. "Techniques of Digital Signal Processing Applied to Analysis of Activity Rhythms of *Drosophila melanogaster*." Invited poster-paper in Gordon Research Conference on Chronobiology, Plymouth NH.
- Ringo, J. and H. Dowse. 1986. "Analyzing asymmetry in mating experiments." Annual meeting of the Society for the Study of Evolution, University of New Hampshire, Plymouth, NH.
- Ringo, J. and H. Dowse. 1987. "Phenocopies of *period* mutants produced by light deprivation of wild-type *Drosophila*." Annual meeting of the Behavior Genetics Association, University of Minnesota, Minneapolis, MN.
- Ringo, J., H. Dowse and D. Jucovics. 1987. "Abnormal circadian rhythms in light deprived *Drosophila*." Maine Biomedical Sciences Symposium, Bowdoin College, Brunswick, ME.
- Dowse, H., J. Ringo and D. Jucovics. 1987. "The effect of temperature shifts upon the endogenous activity rhythms of *Drosophila* mutant for the sex linked *period* gene." Maine Biomedical Sciences Symposium, Bowdoin College, Brunswick, ME.

- Dowse, H.B., L. Kass and J. Ringo. 1987. "Close parallels between puparial heart rate and circadian rhythms in clock mutants of *Drosophila*." The 2nd Cold Spring Harbor Conference on the Molecular Neurobiology of *Drosophila*, Cold Spring Harbor, Long Island, NY.
- Dowse, H. 1987. "Rearing wild-type *Drosophila melanogaster* in constant darkness produces activity rhythm phenocopies of individuals mutant for the sex-linked *period* gene." Invited poster-paper in Gordon Conference on Chronobiology, Plymouth, NH.
- Dowse, H., L. Kass, and J. Ringo. 1988. "Studies on a congenital heart defect in *Drosophila*." Maine Biomedical Sciences Symposium, University of Maine, Orono, ME.
- Ringo, J., and H. Dowse. 1988. "New clock mutants in *Drosophila*." Maine Biomedical Sciences Symposium, University of Maine, Orono, ME.
- Ringo, J. and H. Dowse. 1988. "*Dusky*<sup>73</sup>, a new clock mutant in *Drosophila melanogaster*." Meeting of the Behavior Genetics Association, University of Nijmegen, The Netherlands.
- Dowse, H., L. Kass and J. Ringo. 1988. "Studies on a congenital heart defect in *Drosophila*." Meeting of the Behavior Genetics Association, University of Nijmegen, The Netherlands.
- Dowse, H.B., and J.D. Palmer. 1989. "Evidence for ultradian rhythmicity in an intertidal crab." Meeting of the International Society for Chronobiology, Washington, DC.
- Dowse, H.B. 1990. "Ultradian oscillations in *Drosophila* locomotor activity." Gregynog Research Colloquium and Conference: Rhythms and Cycles/ Molecular Aspects of Development. Gregynog Conference Center of the University of Wales, Gregynog, Wales.
- Dowse, H.B., L. White, and J.M. Ringo. 1990 "Deuterium lengthens the period of circadian rhythms in clock mutants of *Drosophila*. Meeting of the Behavior Genetics Association, Modane, France
- White, L., J. Ringo, and H. Dowse. 1990. "Clock mutations at the *dusky* locus of *Drosophila*." Maine Biomedical Sciences Symposium, Mount Desert Island Biological Laboratory, Bar Harbor, ME.
- White, L., H. Dowse, and J. Ringo. 1990. "Freerunning circadian period in *Drosophila period* mutants is lengthened by heavy water." Maine Biomedical Sciences Symposium, Mount Desert Island Biological Laboratory, Bar Harbor, ME.
- Teneiro, S., H. Dowse, S. D'Souza, D.S. Minors, and J.M. Waterhouse. 1991. "Rhythms of heart rate in premature babies in intensive care." Meeting of the European Society for Chronobiology, Munich, Germany. May/June 1991.

- Ringo, J.M., and H.B. Dowse. 1991. "A temperature-sensitive neurological mutation affects heartbeat in *Drosophila melanogaster*." Meeting of the Behavior Genetics Society, Columbia, Missouri. June, 1991.
- Morrison, D., H. Dowse, and L. Kass. 1992. "Temperature-compensation and occasional overcompensation of circadian rhythmicity in the *Limulus* visual system." Maine Biomedical Sciences Symposium.
- Tyler, M.S., J. Watler, H. Dowse, and J. Ringo. 1992 "Expression of the *apterous* gene in *Drosophila melanogaster*." Northeast Conference on Developmental Biology, Marine Biological Laboratory, Woods Hole, MA.
- Tyler, M., J. Ringo, and H. Dowse. " $\beta$ -Galactosidase staining in axenic cultures of *Drosophila* carrying a *lac-z* insert on a *per*-gene promoter." Northeast Conference on Developmental Biology, Marine Biological Laboratory, Woods Hole, MA.
- Dowse, H., William Bray, Erik Johnson, and John Ringo. 1995. Wavelet Analysis of Heartbeat in *Drosophila*. Proceedings of the Maine Biomedical Sciences Symposium, 21: 4.
- Johnson, Erik, John Ringo, and Harold Dowse. 1995. A neurological mutation that produces heart arrhythmia. Proc. Maine Biomedical Sciences Symposium, 21: 4.
- Pregger, Becky, John Ringo, and Harold Dowse. 1995. Components of *Drosophila* mating song. Proc. Maine Biomedical Sciences Symposium, 21: 12.
- Dowse, Harold B. and W. Bray. Wavelet analysis of activity rhythms of tidal organisms reveals their time-frequency structure. World Conference on chronobiology and chronotherapeutics, Ferrara Italy, September 6-10, 1995. (Oral presentation.)
- Bray, N., Ringo, J., and H. Dowse. 1996. A morphological study of the dorsal vessel in *Drosophila melanogaster*. Second annual Symposium on Integrated Microscopy. Madison, Wisconsin 20-22 September, 1996.
- Johnson, E., N. Bray, J. Ringo, and H. Dowse. 1997. Molecular dissection of the cardiac pacemaker of *Drosophila melanogaster*. Proceedings, 47<sup>th</sup> annual Maine Scientific Session, Maine cardiovascular Research Network, American Heart Association. Newry, ME 26 April, 1997, 13.
- Talyn, B., J. Ringo, and H. Dowse. 1998. Genetic variation in courtship behavior by *D. melanogaster* males towards other species of females. 39<sup>th</sup> Annual *Drosophila* Research Conference (Genetics Society of America), 25-29 March, 1998, Washington DC.
- Johnson, E., J. Ringo, and H. Dowse. 1998. Electrocardiogram analysis of heartbeat. 39<sup>th</sup> Annual *Drosophila* Research Conference (Genetics Society of America), 25-29 March, 1998, Washington DC.

- Dowse, H., E. Johnson, and J. Ringo. 1998. Dissection of the cardiac pacemaker. 39<sup>th</sup> Annual *Drosophila* Research Conference (Genetics Society of America), 25-29 March, 1998, Washington DC.
- Tabone, M. E. Johnson, H. Dowse, H LaVoie, P. Ruben, and L. Kass. 1999. Reconstituting an action potential in frog eggs. Transactions of the MBSS, Jackson Laboratory, Bar Harbor, ME.
- Johnson, E. and H. Dowse. 1999. Construction of an ionic oscillator in *Xenopus* oocytes. MBSS, 6&7 May, 1999, The Jackson Laboratory, Bar Harbor, ME.
- Dowse, H. E. Johnson, and J. Ringo. 1999. The *Drosophila* cardiac pacemaker. MBSS, 6&7 May, 1999, The Jackson Laboratory, Bar Harbor, ME.
- Gaten, E., Huston, S., Dowse, H. & Matheson, T. (2010) Circadian rhythmicity in the response of a collision detecting interneuron differs in solitary and gregarious locusts. Society for Research on Biological Rhythms conference. Sandestin, Florida, USA.).
- Beasley, V. and H. Dowse. 2012. Effects of NCX mutations on *Drosophila* heart beat. Maine chapter of Society for Neuroscience meeting, New England College of Osteopathic Medicine.
- Kyriacou, C. and H. Dowse. 2014. Ultradian periodicities in *Drosophila* mating song—reflux. Maine chapter of Society for Neuroscience meeting, Orono, ME.
- Dowse, H. 2022. Melatonin increases the regularity of cardiac rhythmicity in the *Drosophila* heart in both wild-type and strains bearing pathogenic mutations. European Society of Medicind (ESMED) General Assembly, Madrid.
- Dowse, H. 2022. Melatonin substantially increases the regularity of heartbeat in a model system. Keynote address. 2nd International Conference on Global Healthcare and Nutrition. Paris France.

## Seminars

Dept. of Zoology, University of Maine, Orono, ME	1979
Dept. of Biology, Bates College, Lewiston, ME	1981
Dept. of Biology, Colby College, Waterville, ME	1981
Dept. of Biology, Colby College, Waterville, ME	1985
Dept. of Zoology, University of Maine, Orono, ME	1985
Dept. of Anatomy, New England College of Osteopathic Medicine, Biddeford, ME	1985
Dept. of Biology, Harvard University	1989
Dept. of Life Sciences, U. Maine, Farmington	1990
Dept. of Zoology, University of Mass., Amherst	1990
Division of Neurosciences, Beckman Research Institute of the City of Hope, Duarte CA	1992
Dept. of Zoology, University of New Hampshire, Durham, NH	1992
Mount Desert Island Biological Laboratory (For the American Heart Association)	1993
Dept. of Biology, Bates College	1998
Shriner's Children's Hospital, Sacramento, CA	2000
Dept. of Biology, U. Maine	2001
Burnham Institute, San Diego, CA	2004
Bowdoin College, New Brunswick, ME	2007
Amherst College, Amherst MA	2010
University of Konstanz, Konstanz, Germany/ Max Planck Institute für Ornithologie	2011



## Grant Activity:

### Funded Proposals

1986-1987	Faculty Research Fund, UM \$2,863
1986-1988	UM Equipment Award \$3,663
1988-1989	Biomedical Research Support Group of the National Institutes of Health. \$1,528
1989-1992	National Institutes of Health "Genetics of circadian and ultradian oscillators." Principal Investigator \$97,090 for 1st year \$59,426 for 2nd year \$75,082 for 3rd year
1991-1992	American Heart Association "Genetic dissection of cardiac physiology." Principal Investigator \$20,500 (one year)
1992-1994	American Heart Association "Electrophysiology of <i>Drosophila</i> heart function." Principal Investigator \$45,864 (two years)
1991	National Institutes of Health "Small Instrument Grant" Principal Investigator \$6,125
1994-1996	American Heart Association "Cellular Biology of a congenital heart defect in <i>Drosophila</i> ." Principal Investigator \$46,050 (two years)

- 1995-1996 Bird and Bird Instructional Grant to make a movie of the life cycle, genetics, and biology of *Drosophila*.  
Co PI  
\$5,144
- 1998-2000 National Science Foundation  
“A new course promoting science as a way of knowing.”  
Instrumentation and Laboratory Improvement grant (ILI). Proposal for startup funds for laboratories for BIO110, Biology: The living science. A course for non-majors emphasizing the process of scientific thought.  
Principal Investigator  
\$59,600 (50% UM Cost-sharing)
- 1998-1999 UM Faculty Research Funds  
Molecular Mechanisms of hormonal control of a cardiac pacemaker.  
\$3,341
- 1999-2000 UM Faculty book and equipment award  
\$4425
- 1999 College of NFA, Research and development money  
\$12,000
- 2002 UM Faculty Research funds  
Molecular expression of a heart calcium channel encoded by the *Drosophila cacophony* gene.  
\$6000
- 2005 UM Faculty Research Funds  
*Involvement of Calcium-release channels in the sarcoplasmic reticulum in Drosophila heart pacemaker cells.*  
\$4,765
- 2005 Provost’s faculty laptop initiative:  
\$2,047
- 2008-2009 Maine Institute of Human Genetics and Health  
  
Intracellular calcium release in cardiac pacemaking in a *Drosophila* model system.
- 2010 Transgenic effects of radon and arsenic on cardiac physiology and mating song of *Drosophila melanogaster*

\$28,900

**Proposals submitted and currently in review.**

**Proposals submitted but not funded (Requested funds noted.)**

- 1984 National Science Foundation  
"Biological clocks and aging."  
Co-Principal Investigator  
\$238,000
- 1984 National Institutes of Health  
"Aging accelerated by clock shifts."  
Co-Principal Investigator  
\$395,000 Approved, not funded.
- 1987 National Institutes of Health  
"Physiology of ultradian and circadian oscillators."  
Principal Investigator  
\$164,000
- 1987 National Science Foundation  
"Biological oscillators in *period* mutants of *Drosophila*.  
Principal Investigator, submitted with J. Ringo  
\$309,623  
Withdrawn upon funding by NIH for the same project.
- 1987 American Heart Association  
"A model congenital cardiac arrhythmia in *Drosophila*."  
Principal Investigator  
\$21,000
- 1992 National Institutes of Health  
"Biomedical Research Support Grant"  
Principal Investigator  
\$50,000 (one year)
- 1996-1998 American Heart Association  
"Molecular Dissection of the *Drosophila* cardiac pacemaker."  
Principal Investigator  
\$49,670 (two years)
- 1997-2000 American Heart Association  
"Characterizing Ion Channels of *Drosophila*'s Cardiac Pacemaker"  
\$47,545

1998-2001 American Heart Association  
 Ionic Mechanisms in the Cardiac Pacemaker of *Drosophila*.  
 \$50,395

1998-2001 National Institutes of Health (RO1)  
 “*Drosophila* as a Model Cardiac System”  
 \$633,815

2000-2002 American Heart Association  
 “Expression of cardiac ion channels in the *Xenopus* oocyte system.”  
 \$87,632

2002-2007 National Institutes of Health, RO1  
 “Ion Channels: Genetics, Kinetics, and Modeling”  
 \$2,369,256

2004-2010 National Institutes of Health (RO1)  
 Ion-channel variants and repetitive-pattern phenotypes.  
 \$2,341,291

2005-2011 National Institutes of Health (RO1)  
 Ion-channel variants and repetitive-pattern phenotypes.  
 \$1,789,899

2008-2010 National Science Foundation  
 Ion Channel Variants and Oscillatory Phenotypes  
 \$817,197

Department of Defense, CDMRP Hypothesis Development Awards.  
 Regulation of Adrenergic Receptors in Cardiac Stress  
 \$153,418

American Heart Association, predoctoral training grant.  
 \$22,000