

KAREN A. HICKS

Associate Professor, Biology Department
Kenyon College, Gambier, OH 43022
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EDUCATION

Massachusetts Institute of Technology, Cambridge, MA. Ph.D. in Biology, 1993. Thesis: Altering the level and regulation of the sigma-A subunit of *Bacillus subtilis* RNA polymerase affects gene expression and development. Advisor: Alan D. Grossman, Biology Department.

Swarthmore College, Swarthmore, PA. B.A. 1986, special major in Biochemistry.

Undergraduate research thesis: Attempted Purification of the Naphthylphthalamic Acid-Binding Protein of *Curcubita pepo* Hypocotyls using Affinity Chromatography. Advisor: Judith G. Voet, Chemistry Department.

PROFESSIONAL EXPERIENCE

Chair. Biology Department, Kenyon College. 2008-present.

Associate Professor. Biology Department, Kenyon College. 2005-present.

Visiting Scientist (sabbatical leave). Department of Plant Developmental Biology, Max Planck Institute for Plant Breeding Research, Cologne, Germany. 2006-2007. Comparative analysis of photoperiodic regulation in land plants.

Assistant Professor. Biology Department, Kenyon College. 1999-2005.

Lecturer/Research Associate. Department of Biology, Vanderbilt University. 1998-1999.

Postdoctoral Fellow. Advisor: D. Ry Meeks-Wagner, Institute of Molecular Biology, University of Oregon. 1993-1998.

Technician for Donald M. Coen, Department of Biological Chemistry and Molecular Pharmacology, Harvard Medical School. 1987-1988.

Technician for Marsha R. Rosner, Department of Applied Biological Sciences, Massachusetts Institute of Technology. 1986-1987.

TEACHING EXPERIENCE (Kenyon College only)

Biology 109: Introduction to Experimental Biology, Fall 2003, 2004.

Biology 111: Introduction to Experimental Molecular Biology, Spring 2003, 2005.

Biology 114: Genetics and Development of Organisms, Spring 2000–2003, 2005, 2008; Fall 2005, 2007.

Biology 233: Plant Biology, Fall 1999 – 2001, 2004.

Biology 234: Laboratory Experience in Plant Biology, Fall 1999, 2000, 2002, 2004.

Biology 255: Genetic Analysis, Fall 2007, 2008.

Biology 256: Experimental Genetic Analysis, Fall 2001, 2003, 2005, 2008.

Biology 321: Developmental Biology, Spring 2000 – 2002, 2004, 2006, 2008.

Biology 322: Experiments in Developmental Biology, Spring 2001, 2004, 2006, 2008.

Biology 386: Research in Biology, Fall 2008, Spring 2006.

Biology 397-398: Junior Honors, Spring, Fall 2000.

Biology 470: Senior Seminar: Information and Communication, Fall 2001.

Biology 497-498: Senior Honors, Fall 2001, Spring 2004.

GRANT SUPPORT

U.S. Department of Agriculture, Research Career Enhancement Award: Comparative analysis of photoperiodic regulation in land plants, 8/1/06-7/31/07 (\$50,783).

Kenyon College Teaching Initiatives Grant: Stereomicroscopy with digital image capture for the Biology laboratory curriculum, 2005-2006, with Chris Gillen, Kathryn Edwards, and Harry Itagaki (\$26,664).

Labalme Faculty Development Grant to Support Research that Involves International Travel: Comparative analysis of photoperiodic regulation in land plants, 2005 (\$5,000).

National Science Foundation, RUI: Genetic and Molecular Analysis of Photoperiodic Flowering in *Arabidopsis*, 9/1/02 - 9/1/06 (\$270,000).

Kenyon College Faculty Development Grant: The 15th International Conference on Arabidopsis Research, 2004 (\$1,100).

Kenyon College Teaching Initiatives Grant: Respirometry Equipment for the Biology Laboratory Curriculum, 2003, with Chris Gillen (\$10,950).

Ohio Plant Biotechnology Consortium, Characterization of Novel Suppressors of an Early Flowering Mutant for Directed Manipulation of Photoperiodic Flowering in Crop Plants, co-PI with David E. Somers, Ohio State University, 8/15/01 - 8/15/02 (\$10,000).

National Institutes of Health postdoctoral fellowship, Analysis of signal transduction pathways controlling developmental timing in *Arabidopsis thaliana*, 10/95-9/97.

National Institutes of Health institutional pre-doctoral training grant (MIT), 9/88 - 8/90, 1/91-9/91.

PUBLICATIONS

Rensing SA, Lang D, Zimmer AD, Terry A, Salamov A, Shapiro H, Nishiyama T, Perroud PF, Lindquist EA, Kamisugi Y, Tanahashi T, Sakakibara K, Fujita T, Oishi K, Shin-I T, Kuroki Y, Toyoda A, Suzuki Y, Hashimoto S, Yamaguchi K, Sugano S, Kohara Y, Fujiyama A, Anterola A, Aoki S, Ashton N, Barbazuk WB, Barker E, Bennetzen JL, Blankenship R, Cho SH, Dutcher SK, Estelle M, Fawcett JA, Gundlach H, Hanada K, Heyl A, Hicks KA, Hughes J, Lohr M, Mayer K, Melkozernov A, Murata T, Nelson DR, Pils B, Prigge M, Reiss B, Renner T, Rombauts S, Rushton PJ, Sanderfoot A, Schween G, Shiu SH, Stueber K, Theodoulou FL, Tu H, Van de Peer Y, Verrier PJ, Waters E, Wood A, Yang L, Cove D, Cuming AC, Hasebe M, Lucas S, Mishler BD, Reski R, Grigoriev IV, Quatrano RS, Boore JL.. 2008. The *Physcomitrella* genome reveals evolutionary insights into the conquest of land by plants. *Science* 319:64-69.

Kim, W.-Y., Hicks, K.A., and Somers, D.E. 2005. Independent roles for *EARLY FLOWERING 3* and *ZEITLUPE* in the control of circadian timing, hypocotyl length and flowering time. *Plant Physiology* 139: 1557-1569.

Hicks, K.A., Albertson, T.M., and Wagner, D.R. 2001. *EARLY FLOWERING 3* encodes a novel protein that regulates circadian clock function and flowering in *Arabidopsis*. *Plant Cell* 13:1281-1292.

- Hicks, K.A., Millar, A.J., Carré, I.A., Somers, D.E., Straume, M., Meeks-Wagner, D.R., and Kay, S.A. 1996. Conditional circadian dysfunction of the *Arabidopsis early-flowering 3* mutant. *Science* 274:790-792.
- Hicks, K.A., Sundås, A., and Meeks-Wagner, D.R. 1996. *Arabidopsis* early-flowering mutants reveal multiple levels of regulation in the vegetative-to-floral transition. *Sem. Cell Dev. Biol.* 7:409-418.
- Zagotta, M.T., Hicks, K.A., Jacobs, C.I., Young, J.C., Hangarter, R.P., and Meeks-Wagner, D.R. 1996. The *Arabidopsis ELF3* gene regulates vegetative photomorphogenesis and the photoperiodic induction of flowering. *Plant J.* 10:691-702.
- Hicks, K.A. and Grossman, A.D. 1996. Altering the level and regulation of the major sigma subunit of RNA polymerase affects gene expression and development in *Bacillus subtilis*. *Mol. Microbiol.* 20: 201-212.
- Hicks, K.A. and Grossman, A.D. 1995. Characterization of *csh203::Tn917lac*, a mutation in *Bacillus subtilis* that makes the sporulation sigma factor sigma-H essential for normal vegetative growth. *J. Bacteriol.* 177: 3736-3742.
- Pelosi, E., Hicks, K.A., Sacks, S.L., and Coen, D.M. 1992. Heterogeneity of a herpes simplex virus clinical isolate exhibiting resistance to acyclovir and foscarnet. In *Innovations in antiviral development and the detection of virus infections*, T. M. Block, R. L. Crowel, D. L. Jungkind, and L. Walsh, eds. (Plenum Press, New York), pp. 151-158.
- Grossman, A.D., Ireton, K., Hoff, E.F., LeDeaux, J.R., Rudner, D.Z., Magnuson R., and Hicks, K.A. 1991. Signal transduction and the initiation of sporulation in *Bacillus subtilis*. *Semin. Dev. Biol.* 2:31-36.
- Hicks, K., Friedman, B., and Rosner, M.R. 1989. Basic fibroblast-like growth factor is present in the conditioned medium of simian sarcoma virus transformed NRK cells. *Biochem. Biophys. Res. Comm.* 164:1323-1330.
- Hicks, K., Friedman, B., and Rosner, M.R. 1989. Basic and acidic fibroblast growth factors modulate the epidermal growth factor receptor by a protein kinase C-independent pathway. *Biochem. Biophys. Res. Comm.* 164: 796-803.
- Leib, D.A., Bogard, C.L., Kosc-Vnenchak, M., Hicks, K.A., Coen, D.M., Knipe, D.M., and Schaffer, P.A. 1989. A deletion mutant of the latency-associated transcript of herpes simplex virus type 1 reactivates from the latent state with reduced frequency. *J. Virol.* 63:2893-2900.
- Leib, D.A., Coen, D.M., Bogard, C.L., Hicks, K.A., Yager, D.R., Knipe, D.M., Tyler, K.L., and Schaffer, P.A. 1989. Immediate-early regulatory gene mutants define different stages in the establishment and reactivation of herpes simplex virus latency. *J. Virol.* 63:759-768.
- Sacks, S.L., Wanklin, R.J., Reece, D.E., Hicks, K.A., Tyler, K.L., and Coen, D.M. 1989. Progressive esophagitis from acyclovir-resistant herpes simplex. Clinical roles for DNA Polymerase mutants and viral heterogeneity? *Ann. Intern. Med.* 111:893-899.
- The Biology and Gender Study Group: A. Beldecos, S. Bailey, S. Gilbert, K. Hicks, L. Kenschaft, N. Niemczyk, R. Rosenberg, S. Schaertel, and A. Wedel. 1989. The Importance of Feminist Critique for Contemporary Cell Biology. In *Feminism & Science*, N. Tuana, ed. (Indiana University Press, Bloomington and Indianapolis), pp. 172-187.

PATENTS

- Wagner, R., Hicks, K. A., Spence, M.T.Z., Foss, H., Liu, X.L., Covington, M.F. 2004. Nucleic acid encoding the Arabidopsis ELF3 protein and a method of using it to alter photoperiod in plants. U.S. Patent #6,689,940.
- Wagner, R., Hicks, K. A., Spence, M.T. Z., Foss, H., Liu, X.L., Covington, M.F. 2002. Promoter regulating circadian clock function and photoperiodism. U.S. Patent #6,433,251.

NATIONAL AND INTERNATIONAL MEETING PRESENTATIONS

- Hicks, K.A., Aloe, A.E., and Booth, A.J. 2004. Identification of enhancers of *elf3-7* through activation tagging. 15th International Conference on Arabidopsis Research, Berlin, Germany: T01-080.
- Lynd, K.E. and Hicks, K.A. 2004. Characterization and mapping of *photoperiod-sensitive suppressors of elf3-1*. 15th International Conference on Arabidopsis Research, Berlin, Germany: T01-081.
- Booth, A. J. and Hicks, K. A. 2003. Identification of second site modifier mutations of *elf3* through activation tagging. Plant Biology 2003 conference, Honolulu, HI, 521.
- Boyce, M.J. and Hicks, K.A. 2003. Mapping *pse13*, a photoperiod sensitive suppressor of *elf3-1*. 14th International Conference on Arabidopsis Research, Madison, Wisconsin: 257.
- Farrell, J.A. and Hicks, K.A. 2003. Mapping of the *elf3* suppressor *PSE1*. 14th International Conference on Arabidopsis Research, Madison, Wisconsin: 268.
- Hicks, K.A., Boyce, M.J., Gordon, L.M., Moore, M., Ramser, S.E., and Scott, A.E. 2001. Genetic analysis of photoperiodic flowering in Arabidopsis thaliana. Plant Biology 2001 conference, Providence, RI, 15001 (talk), 184 (poster).
- Hicks, K.A., Gordon, L.M., Skrzypek, A.D., and Wagner, D.R. 2000. Genetic analysis of photoperiodic floral induction. 11th International Conference on Arabidopsis Research, Madison, Wisconsin: 313.
- Hicks, K.A. and Meeks-Wagner, D.R. 1997. Genetic analysis of photoperiodic floral induction. 8th International Conference on Arabidopsis Research, Madison, Wisconsin: 9-12.
- Hicks, K.A., Kay, S.A., and Meeks-Wagner, D.R. 1996. The photoperiod-insensitive *early flowering 3* mutant is conditionally defective in circadian regulated processes. 7th International Conference on Arabidopsis Research, Norwich, UK: S33.
- Hicks, K.A., Kay, S.A., and Meeks-Wagner, D.R. 1995. Analysis of signal transduction pathways controlling developmental timing in Arabidopsis. Signal Transduction in Plants, Keystone Symposium, Hilton Head Island, South Carolina: J6-308.
- Hicks, K.A., Kay, S.A., and Meeks-Wagner, D.R. 1995. *ELF3* is defective in circadian responses and photoperiodic induction of flowering. 6th International Conference on Arabidopsis Research, Madison, Wisconsin: 438.
- Hicks, K.A. and Grossman, A.D. 1992. Competition between sigma factors of RNA Polymerase: The major sigma subunit sigma-A affects transcription directed by the minor sigma subunit sigma-H. Eleventh International Spores Conference, Woods Hole, Massachusetts.
- Hicks, K.A. and Grossman, A.D. 1992. Competition between sigma factors of RNA Polymerase: The major sigma subunit sigma-A affects transcription directed by the minor sigma subunit

sigma-H in *Bacillus subtilis*. Molecular Genetics of Bacteria and Phages, Cold Spring Harbor, New York.

SELECTED INVITED RESEARCH SEMINARS

Plant Molecular Biology and Biochemistry Symposium, Ohio State University, April 2008.

Biology Department, University of Freiberg, February 2007.

Department of Horticulture and Crop Science, Ohio Agricultural Research and Development Center, March 2006.

Pursuing Scientific Interests, Wooster College, February 2006.

Department of Biology, Grinnell College. March 2005.

Judith G. Voet Retirement Symposium, Department of Chemistry, Swarthmore College, June 2004.

Departments of Botany and Microbiology and Zoology, Ohio Wesleyan University, April 2004.

Department of Biology, Swarthmore College, February 2004.

Departments of Horticulture and Crop Science and Plant Biology, Ohio State University, January 2000.

RESEARCH PROJECTS WITH KENYON COLLEGE UNDERGRADUATES

Amy E. Aloe, 2003-2006. "Using activation tagging to identify modifiers of *elf3*." Research in Biology class, Summer Science Scholar, Biology Honors program, graduated with High Honors.

Adam J. Booth, 2002 - 2003. "Identification of second-site modifier mutations of *elf3* in *Arabidopsis thaliana* through activation tagging." Research in Biology class, Summer Science Scholar funded by an American Society of Plant Biologists Summer Undergraduate Research Fellowship, Biology Honors program, graduated with Highest Honors.

Matthew J. Boyce, 2001 - 2003. "Mapping *pse13*: a photoperiod sensitive suppressor of *elf3-1*." Research Assistant, Research in Biology class, Summer Science Scholar.

Heather Ann Brauer, Fall 2001. "Photoperiodic regulation of flowering." Research Assistant.

Andrew R. Farrell, 2002 - 2003. "Molecular Mapping of *PSE1* in *Arabidopsis thaliana*." Research in Biology class, Summer Science Scholar, Research Assistant.

Lydia M. Gordon, 1999 - 2001. "Determining the relationship between the circadian clock in *Arabidopsis thaliana* and photoperiodic regulation of flowering." Research Assistant, Summer Science Scholar, Research in Biology class.

Jennifer Kao, 2004 - 2005. "Characterization and mapping of *pse15*." Research in Biology class.

Kathryn E. Lynd, 2002 - 2004. "Mapping and characterization of *pse* mutations." Research in Biology class, Research Assistant, Summer Science Scholar, Biology Honors program, graduated with High Honors.

Melina Moe, 2004 -2006. "Identification of extragenic enhancers of *elf3-7* using insertional mutagenesis." Research Assistant, Research in Biology class.

Brad Oberle, Fall 2001. "Complementation analysis of *pse* mutants." Research in Biology class.

Ansley E. Scott, 2001 - 2002. "Characterization of *pse12*, a mutation that restores photoperiod sensitivity in *elf3* mutant plants." Summer Science Scholar, Biology Honors program, graduated with Highest Honors.

Samuel E. Shopinski, 2003-2006. "Characterization of *pse* mutants." Research in Biology class, Summer Science Scholar, Biology Honors program, graduated with Honors.

Adrienne D. Skrzypek, 1999 - 2000. "Photoperiodic regulation of flowering." Research Assistant, Summer Science Scholar.

Erica D. Silen, Summer 2000. "*Arabidopsis thaliana*, identifying and analyzing new genes required for sensing and responding to daylength." Summer Science Scholar.

Bethany A. Taylor, 2004-2006. "Isolation of T-DNA insertion sites using splinkerette technology," and "Characterization and mapping of *pse7*." Research in Biology class, Research Assistant.

Emily Vaughn. 2005-2006. "Microarray analysis of photoperiodic flowering in *Arabidopsis thaliana*." Research in Biology class.

SELECTED EXTRA-COLLEGIATE SERVICE

Grant review panelist for National Science Foundation, 2008.

Manuscript reviewer for New Phytologist, 2007.

Mentor for Preparing Future Faculty Program, Ohio State University, 2002, 2005, 2006.

Grant proposal reviewer for U.S. Department of Agriculture, 2002, 2003, 2005.

Grant proposal reviewer for National Science Foundation, 2006.

Textbook reviewer for W. H. Freeman & Co., 2002, 2003, 2004.

Textbook reviewer for Pearson Benjamin Cummins, 2003, 2006.

Manuscript reviewer for Plant Molecular Biology, 2002.

Session chair at Plant Biology 2001 conference (Providence, RI).

SELECTED COLLEGIATE SERVICE

Search committee chair for visiting position, Biology Department, Spring 2008.

Co-director of Biochemistry and Molecular Biology interdisciplinary program, 2007 – present.

Institutional Biosafety Committee, 2007 – present.

Goldwater Scholarship Faculty Liaison, 2003 – 2006, 2007 – present.

Junior Faculty Marshall, 2000 - 2006.

Faculty Affairs Committee, 2003 - 2005.

Silverweed Program, Summer 2003, 2005.

Reviewer for Honors/Science Scholar and Diversity Scholar programs, 2001-2005.

Management of greenhouse and plant growth chambers, 2000 - 2004

Radiation Safety Officer, 2000-2005.

Alternate Radiation Safety Officer, 1999-2000, 2005-2006.

PROFESSIONAL SOCIETY MEMBERSHIPS

American Association for the Advancement of Science

American Society of Plant Biologists

Sigma Xi