ERIC C. LIEBL

Biology Department, Denison University

Curriculum Vitae

196 Dorrence Road
Granville OH 43023
(740)587-1943

Department of Biology
Denison University
Granville, OH 43023
(740)587-6612
liebl@denison.edu

EDUCATION

Doctor of Philosophy (Ph.D.)
Molecular and Cell Biology, University of California-Berkeley, Berkeley, CA, 1991.
Dissertation: "Mutational Analysis of Transformation by pp60$^{v\text{-}src}$"

Bachelor of Science (B.S.)
Molecular Biology, University of Wisconsin-Madison, Madison, WI, 1985.
German, University of Wisconsin-Madison, Madison, WI, and Friedrich Wilhelm University, Bonn, Germany, 1985.

PROFESSIONAL EXPERIENCE

TEACHING

Professor, Denison University, Department of Biology. 9-2007 to present. Developed and taught original courses with laboratories: Biology 325, Genetics; Biology 324, Developmental Biology; Biology 401, Advanced Biochemistry; Biology 210, Unicellular Life; Honors 194, Biomedical Ethics; Biology 100 and First Year Studies-102, The Biology of Bioethics (for non-majors).

Associate Professor, Denison University, Department of Biology. 9-2000 to 9-2007.

Assistant Professor, Denison University, Department of Biology. 9-1994 to 9-2000.

Teaching Assistant, University of CA-Berkeley, Department of Molecular and Cell Biology. Molecular Biology 100, Introduction to Molecular Biology; led discussion sections, graded exams and papers.

RESEARCH

Denison University, Department of Biology. 1994 to present. Continuing research, involving advanced undergraduate students, using *Drosophila* genetics to uncover and characterize proteins that function in the proper development of the nervous system.

Postdoctoral Fellow, **Damon Runyon-Walter Winchell Cancer Research,** McArdle Laboratory for Cancer Research, University of Wisconsin-Madison. Professor F. Michael Hoffmann, supervisor; 1991 to 1994. Used *Drosophila* genetics and molecular biology to dissect signal transduction pathways regulated by the c-*abl* tyrosine kinase proto-oncogene.

Graduate Student, Department of Molecular and Cell Biology, University of California- Berkeley. Professor G. Steven Martin, supervisor; 1986-1991. Characterized host-range mutants of the v-*src* tyrosine kinase to identify signal transduction pathways influenced by this oncogene; engineered and characterized chimeric molecules between the v-*src* oncogene and various other genes to investigate the importance of the subcellular localization of the tyrosine kinase for transformation.

Research Assistant, Department of Oncology, University of Wisconsin-Madison. Professor G.C. Mueller, supervisor; 1985-1986. Identified and characterized a unique phospholipid produced after treatment with the protein kinase C agonist TPA.

SIGNIFICANT PROFESSIONAL SERVICE

Member of Denison's Institutional Review Board (human subjects' research) 8-2014 to 8-2017

Elected member of President's Advisory Board, Denison University, 9-2009 to 8-2012
Elected member of Finance Committee, Denison University, 9-2008 to 5-2011
Chair, Department of Biology, Denison University, 5-2002 to 6-2007
Neuroscience Concentration Coordinator, 5-2008 to 5-2010; 5-2012 to 5-2013
Battelle Memorial Institute Research awards point-person, 2004 - 2011
Ad Hoc Manuscript Reviewer, Oxford Press, Sinauer, *Genetics*, *Oncogene*
Grant Reviewer, National Science Foundation, Developmental Neurobiology, 2011, 2010, 2009, 2008, 2004, 2001
External Reviewer for departmental reviews, Denison University Psychology Department 2016, Denison University Math and Computer Science Department, 2012
External Reviewer for faculty promotions, Kalamazoo College, 2014; Occidental College, 2010; Pomona College, 2007; Kalamazoo College, 2001

HONORS and AWARDS

National Institutes of Health Academic Research Enhancement Award (AREA) Grant, "Understanding Trio and Abl in Drosophila Axon Guidance Through Genetic Modifiers" (PI; 1R15HD059924-01); $196,312; 8/2009 to 8/2012.
Denison University Research Foundation Award, "A Systematic Search for Genetic Interactions Affecting Nervous System Development Involving the Abl Kinase and the Trio Guanine-Nucleotide-Exchange Factor", $10,967, 2008-2009
Richard Lucier Endowed Professorship in recognition of outstanding teaching and scholarship. August 2007 – May 2013
Participant in the Faculty Summer Institute on the Ethical, Legal and Social Implications of the Human Genome Project sponsored by the Dartmouth College Institute for the Study of Applied and Professional Ethics. June, 2004 at Howard University, Washington D.C.
National Science Foundation Grant, "Investigation of the integrated roles of Abl, Trio, and Neurotactin in axon outgrowth" (co-PI; NSF 0344053); $240,000 total award; $65,039 to Denison; 2004-2007
National Science Foundation Grant, "Genetic and Cell Biological Characterization of Trio and Amalgam: Two New Enhancers of Abl" (co-PI; NSF 0990239); $341,752 total award; $218,716 to Denison; 2001-2004
Participant in the Midwest Faculty Conference titled "Genetic Research and Future of Medicine", sponsored by the University of Chicago, February, 2001
R. C. Good Fellowship, Denison University, 2001
Andrew W. Mellon Foundation, Collaboration with Technology Grant (PI); $21,216; 2000-2001
Faculty Professional Development Award, Denison University, 2000
Denison University Research Foundation Award, "Fine Mapping and Cloning of the Fruit Fly *M109* Gene", $3,534, 1999-2000
Faculty Professional Development Award, Denison University, 1999
Junior Faculty Fellowship, Denison University, 1998
National Institutes of Health Academic Research Enhancement Award (AREA) Grant, "Probing Drosophila Abelson Tyrosine Kinase with Genetics" (PI); $98,182; 1996-2000.
Faculty Professional Development Award, Denison University, 1995
Damon Runyon-Walter Winchell Cancer Research Postdoctoral Fellowship, 1991-1994
Outstanding Graduate Student Instructor, University of California, 1988
National Science Foundation Graduate Fellowship Honorable Mention, 1987
Regents Fellowship, University of California, 1986
Honors Degree in Molecular Biology, University of Wisconsin, 1985
Trewartha Honors Undergraduate Research Grant, University of Wisconsin, 1984

PUBLICATIONS Underline indicates Denison student

Brown, HE, Desai, T, Murphy, AJ, Pancholi, H, Schmidt, ZW, Swahn, H, Liebl EC (2017). The function of Drosophila larval class IV dendritic arborization sensory neurons in the larval-pupal transition is separable from their function in mechanical nociception responses. PLoS ONE **12**(9):e0184950. https://doi.org/10.1371/journal.pone.0184950

Dean, KE, Fields, A, Geer, MJ, King, EC, Lynch, BT, Manohar, RR, McCall, JR, Palozola, KC, Zhang, Y, Liebl, EC (2013). An Allele of Sequoia Dominantly Enhances a Trio Mutant Phenotype to Influence Drosophila Larval Behavior. PLoS ONE **8**(12): e84149. https://doi.org/10.1371/journal.pone.0084149

Smith, JA and Liebl, EC (2006). Identification of the Molecular Lesions in Alleles of the Drosophila Abelson Tyrosine Kinase. Drosophila Information Service **88** 20-23.

Forsthoefel, DJ, Liebl, EC, Kolodziej, PA, Seeger, MA (2005). The Abelson tyrosine kinase, the Trio GEF, and Enabled interact with the Netrin receptor Frazzled in *Drosophila*. Development **132** 1983-1994.

Liebl, EC, Rowe, RG, Forsthoefel, DJ, Stammler AL, Schmidt, ER, Turski, M, Seeger, MA. (2003) Interactions between the secreted protein Amalgam, Amalgam's transmembrane receptor Neurotactin and the Abelson tyrosine kinase affect axon pathfinding. Development **130** 3217-3226.

Liebl EC, DJ Forsthoefel, LS Franco, SH Sample, JE Hess, JA Cowger, MP Chandler, AM Shupert, Seeger, MA (2000) Dosage-sensitive, reciprocal genetic interactions between the *Ab*l tyrosine kinase and the putative GEF *trio* reveal *trio's* role in axon pathfinding. Neuron **26** 107-118.

Liebl EC (1999) Molecular Characterization of the Insertion Site in Eight P-Insertion Lines from the Kiss Collection. Drosophila Information Service **82** 79-81.

Liebl EC (1998) Testing for mutagens using fruit flies. The American Biology Teacher **60** 1-5.

Comer AR, EC Liebl and FM Hoffmann (1995) Can clues to the molecular defects in chronic myelogenous leukemia come from genetic studies on the Abelson tyrosine kinase in fruit flies? The Journal of Laboratory and Clinical Medicine **125** 686-691.

Gertler FB, AR Comer, JL Juang, SM Ahern, MJ Clark, EC Liebl and FM Hoffmann (1995). *enabled*, a dosage-sensitive suppresser of mutations in the Drosophila *Abl* tyrosine kinase, encodes an Abl substrate with SH3-domain binding properties. Genes and Development **9** 521-533.

Liebl EC and FM Hoffmann (1994). Growth factors and signal transduction in *Drosophila*. In: M. Nilsen-Hamilton, ed., Growth Factors and Signal Transduction in Development (ISBN 04-71-305391), p. 165-174. Wiley-Liss Inc., New York, NY.

Liebl EC, LJ England and GS Martin (1993). Reactivation of host-dependent *src* kinase activity by coexpression with a heterologous tyrosine kinase. Virology **195** 265-267.

Liebl EC, LJ England, JE DeClue and GS Martin (1992). Host range mutants of v-*src*: Alterations in kinase activity and substrate interactions. J. Virol. **66** 4315-4324.

Liebl EC and GS Martin (1992). Intracellular targeting of pp60^{src} expression: Localization to adhesion plaques is sufficient to transform chicken embryo fibroblasts. Oncogene **7** 2417-2428.

Young JC, EC Liebl and GS Martin (1988). A host-dependent temperature sensitive mutant of Rous sarcoma virus: Evidence for host factors affecting transformation. Virology **166** 561-572.

Pai JK, EC Liebl, CS Tettenborn, FI Ikegwuonu and GC Mueller (1987). 12-O-tetradecanoylphorbol-13-acetate activates the synthesis of phosphatidylethanol in animal cells exposed to ethanol. Carcinogenesis **8** 173-178.

PRESENTATIONS DELIVERED Underline indicates Denison student

Liebl EC, H. Brown, H. Pancholi. Drosophila sensory neurons and the larval forager to wanderer transition. Society for Integrative and Comparative Biology Meeting in Portland OR, 1-16.

Liebl EC. A dosage-sensitive genetic interaction between the Trio GEF and Sequoia transcription factor influences a Drosophila larval behavior. Given at the 73rd Annual Meeting of the Society for Developmental Biology, Seattle WA, 7-14

Liebl EC, K.E. Dean, A.R. Fields, M. J Geer, E.C. King, B. T. Lynch, K.C. Palozola, E.M. Steenkiste, Y. Zhang. Characterizing *M9.17,* a strong dominant enhancer of the *trio* mutant phenotype. Given at the 71st Annual Meeting of the Society for Developmental Biology, Montreal Canada, 7-12

Liebl EC, A.R. Fields, M. J Geer, L.J. Korbel, B. T. Lynch, K.C. Palozola. Characterizing *M9.17*, a strong dominant enhancer of the *trio* and *abl* mutant phenotypes. Given at the 53rd Annual Drosophila Research Conference, San Diego CA, 4-11

Liebl EC, M. J Geer, B. T. Lynch, K.C. Palozola. Characterizing dominant enhancers of a *trio* mutant phenotype. Given at the 52nd Annual Drosophila Research Conference, Washington DC, 4-10

Palozola KC, O. Uguru, K.E. Dean, R.R. Manohar, J.R. McCall, J.A. Smith and E.C. Liebl . Dissecting signal transduction networks involving the Abl tyrosine kinase and the Trio guanine nucleotide exchange factor. Given at the first annual McArdle Laboratory Research Symposium, Madison WI, 10-08.

Liebl EC. Dosage-sensitive genetic interaction affecting axon guidance. Given to the University of Toledo Biology Department, Toledo OH, 2-08.

Liebl EC, CL Baldyga, LL Bickle, A Bishop, KE Dean, M Kopeke, RR Manohar, JR McCall, J McCroskey, JA Smith, MA Seeger. A screen for dominant enhancers of a *trio* mutant phenotype. Given at the 48th Annual Drosophila Research Conference, Philadelphia, PA, 3-07

Liebl EC, CL Baldyga, LL Bickle, M Kopeke, RR Manohar, JR McCall, JA Smith, MA Seeger. A screen for dominant enhancers of a *trio* mutant phenotype. Given at the Cold Spring Harbor Meeting on Neurobiology of Drosophila, Cold Spring Harbor, NY, 9-05

Liebl, EC, RG Rowe, DJ Forsthoefel, AM Stammler, MA Seeger. Identification of *neurotactin* as a dominant enhancer of the Abelson tyrosine kinase mutant phenotype. Given at the 44th Annual Drosophila Research Conference, Chicago IL, 3-03

Liebl, EC. Amalgam functions as a dominant enhancer of the *Abl* mutant phenotype. Given as part of the Science Lecture Series at Ohio Wesleyan University, 11-03

Liebl, EC, ER Schmidt, DJ Forsthoefel, SC Howard, MA Seeger. Identification of *amalgam* as a dominant enhancer of the Abelson tyrosine kinase phenotype. Given at the 42nd Annual Drosophila Research Conference, Washington D.C., 3-01

Liebl EC. Gaining insights into axonal pathfinding: combining genetics and cell biology into an interesting amalgam. Given at the Kenyon College Biology Lecture Series, Gambier, OH, 1-01

Forsthoefel DJ, ER Schmidt, S Howard, MA Seeger, EC Liebl. Trio, a cytoplasmic GEF, and Amalgam, a secreted member of the immunoglobulin superfamily, exhibit dosage-sensitive genetic interactions with the Abelson tyrosine kinase and function in Drosophila axon guidance pathways. Given at the Axon Guidance & Neural Plasticity Meeting, Cold Spring Harbor, NY, 9-00

Liebl EC. Signal transduction in the developing CNS: Reciprocal genetic interactions between the Abl tyrosine kinase and a guanine-nucleotide-exchange factor. Given at the Ohio State Molecular, Cellular and Developmental Biology Seminar Series, The Ohio State University, Columbus, OH, 11-99

Korn JM and EC Liebl. Isolating Dominant Enhancers of the *two-thirds-trio* Mutant Phenotype. Given at the Genetics Society of America's Midwest Drosophila Conference, Allerton Park, IL, 1999

Schmidt ER, SC Howard, R Perala, EC Liebl. Fine Mapping of the *M109* Gene. Given at the Genetics Society of America's Midwest Drosophila Conference, Allerton Park, IL, 1999

Liebl EC, DJ Forsthoefel, SH Sample, LS Franco, JE Hess, MP Chandler, JA Cowger, AM Jackson, MA Seeger. Dosage-Sensitive Interactions Between *two-thirds-trio*, a Putative Guanine-Nucleotide-Exchange Factor, the *Abl* Tyrosine Kinase, *enabled* and *failed-axon-connections*. Given at the Cold Spring Harbor Meeting on Neurobiology of Drosophila, Cold Spring Harbor, NY, 1999

Liebl EC, SH Sample, LS Franco, JE Hess, JA Cowger, AM Jackson, DJ Forsthoefel, MA Seeger. Dosage-Sensitive, Reciprocal Genetic Interactions Between a Putative Guanine-Nucleotide-Exchange Factor and the *Abl* Tyrosine Kinase. Given at the Fifteenth Annual Meeting on Oncogenes and Tumor Supressors: Signal Transduction and Cell Cycle Regulation in Cancer, Fredrick MD, 1999

Liebl EC. These Nobels Were Dynamite: Using the Genius of Morgan, McClintock and Mullis to Clone a Gene. Given at the Biology Symposium, The College of Wooster, September, 1998

Liebl EC. The Last of the Positional Cloners. Given at the I-71 Cellular and Molecular Biologists at Predominantly Undergraduate Institutions Symposium, Kenyon College, July, 1998

Liebl EC, JE Hess, FM Hoffmann. Characterization of M89: A Gene Redundant to the *Abl* Tyrosine Kinase. Given at the Genetics Society of America's Midwest Drosophila Conference, Allerton Park, IL, 1997

Liebl EC and T Schuh. Using *Xenopus* and *Drosophila* in Your Developmental Biology Lab - A Practical Guide. Given at the 55th Annual Society for Developmental Biology Symposium, Nashville, TN, 1996

Liebl EC. Tubby Flies, CNS Axons and Leukemia: Using Genetics to Unravel a Biological Problem. Given to the Denison Scientific Association, Granville, OH, November, 1995

Gertler FB, AR Comer, J-L Juang, SM Ahern, MJ Clark, EC Liebl, FM Hoffmann. *enabled*, a Suppresser of Mutations in the Drosophila Abl Tyrosine Kinase, Encodes an Abl Substrate with SH3-domain Binding Properties Given at the 54th Annual Society for Developmental Biology Symposium, San Diego, CA, 1995

Liebl EC, FB Gertler, FM Hoffmann. Interactions with *dachs* May Link Abl Tyrosine Kinase-Mediated Signal Transduction with Cellular Adhesion. Given at the 53rd Annual Society for Developmental Biology Symposium, Madison, WI, 1994.

Liebl EC, FB Gertler, FM Hoffmann. Genetic Interactions with *dachs* May Serve to Link Abl Tyrosine Kinase-Mediated Signal Transduction with Cellular Adhesion. Given at the 35th Annual Drosphila Research Conference, Chicago, IL, 1994.

Liebl EC, FB Gertler, KK Hill, FM Hoffmann. Genetic Modifiers of the *abl* Mutant Phenotype. Given at the 9th Annual Meeting on Oncogenes, Fredrick, MD, 1993.

Liebl EC, KK Hill, FB Gertler, FM Hoffmann. Second Site Suppressors of the *abl* Mutant Phenotype. Given at the 34th Annual Drosophila Research Conference, San Diego, CA, 1993.

Liebl EC, KK Hill, FB Gertler, MJ Clark, M Visalli, FM Hoffmann. Identification of Second Site Modifiers of the *abl* Mutant Phenotype Given at the 33rd Annual Drosophila Research Conference, Philadelphia, PA, 1992.

Liebl EC, LJ England, GS Martin. Insertion/Deletion Mutagenesis of v-src: Effects on Intracellular Location and Protein-Tyrosine Phosphorylation" Given at the Sixth Annual Meeting on Oncogenes, Fredrick, MD, 1990.

Liebl EC, LJ England, JE DeClue, GS Martin. Intracellular Localization of v-*src*: Effects on Fibroblast Transformation. Given at the Fifth Annual Meeting on Oncogenes, Fredrick, MD, 1989.

Liebl EC and J Pai. Phorbol Esters Induce the Synthesis of Phosphatidyl Alchohols, a Unique Class of Phospholipids. Given at the McArdle Chemical Carcinogenesis Seminar, Madison, WI, 1986.

SENIOR THESIS ADVISED Asterisk denotes an honors / recognition thesis

Impact of Hippo on the Morphology of Class IV Dendritic Arborization Neurons in Drosophila*. Zachary Schmidt, 2018.

Nociception via Class IV Dendritic Arborization Neurons in Drosophila*. Allison Murphy, 2017.

OInvestigating Gene-specific Impacts on the Forager-to-Wanderer Transition in Drosophila melanogaster. Trishna Desai, 2017.

Investigating Dosage Sensitive Interactions Between *trio, trc* and *fry* in *Drosophila melanogaster.* Hannah Swahn, 2016.

PNS-specific Rescue of a Larval Behavioral Mutant Phenotype Using the GAL4-UAS System. Hannah Brown, 2015.

The Role of Biochemical Interactions Between the rhoGEF Trio and the Abl tyrosine kinase in Axon Guidance Pathways During CNS Development of Drosophila. Kelsey Elliott, 2015

Observing Larval Nervous System Structure in *Drosophila melanogaster* Mutants Using GFP Fluorescence*. Harshida Pancholi, 2015

Biochemical characterization of the Abl: Trio interaction. Kelsey Lecerf, 2013

Mapping trio dominant enhancers on the second chromosome of Drosophila melanogaster*. Thomas Graf, 2013

Biochemical characterization of the Abl: Trio interaction*. Bethany Klett, 2013

Characterization of the molecular interactions between the *sequoia* and *trio* genes*. Yan Zhang, 2012

Screening the second chromosome of Drosophila for dominant enhancers of the *trio* and *abl* mutant phenotypes*. Eric C. King, 2012

Generating null alleles of PR2, a non-transmembrane tyrosine kinase that bings GTP-Rac. Lindsey Korbel, 2011

Characterizing the Phenotype of Sequoia$^{M9.17}$ Heterozygous, Trio Homozygous Mutants in the *Drosophila* CNS*. April Fields, 2011

Molecular characterization of the 9.17 mutation in *D. melanogaster*: Identifying a dominant enhancer of *trio*. Bryan Lynch, 2010

A study of novel genes that engage in dosage-sensitive interactions with the Trio family of proteins in Drosophila. Marcus Geer, 2010

Mapping the *M49* mutation in the genome of *Drosophila melanogaster*. Oby Uguru, 2009

Locating dominant enhancers of the *trio* mutant phenotype in *Drosophila melanogaster*. Katherine C. Palozola, 2009

Localizing dominant enhancers of the *trio* mutant phenotype and structure/function assays of Neurotactin. Kathryn Elizabeth Dean, 2007*

Tyrosine phosphorylation of Trio by Abelson tyrosine kinase. Andrew Justin Bishop, 2007*

An investigation of axon pathfinding in the central nervous system of *Drosophila* through the molecular and genetic characterization of dominant enhancers of the *trio* mutant phenotype. Jenna Susanne McCroskey, 2007*

Investigating Neurotactin and localizing the dominant enhancers of the *trio* mutant phenotype. Rohan Raoul Manohar, 2006*

Study on Neurotactin and dominant enhancers of the *trio* mutant phenotype. Lindsay Lee Bickel, 2006*

Identification of protein:protein interactions of the intracellular domain of Neurotactin by biopanning of a phage display cDNA library. Timothy Ryan Heacock, 2004*

Axon pathfinding in the central nervous system of *D. melanogaster*: Determining enhancers of the *trio* mutant phenotype from a random mutagenesis screen. Morgan Rebecca Koepke, 2004*

Interactions with Nrt: A yeast two-hybrid assay. Brant Lloyd Eutzy, 2003*

amalgam and *neurotactin* are dosage-sensetive genetic modifiers of the *Abl* tyrosine kinase mutant phenotype. R. Grant Rowe, 2003*

The development of the central nervous system of *Drosophila melanogaster*: Potential interactions with Trio and Neurotactin. Kara Beth Markham, 2001*

Localization and characterization of the M109 mutation: A new allele of the Drosophila *amalgam* gene. Erica R. Schmidt, 2000*

Isolation of enhancers of the *trio* mutant phenotype. Jay Korn, 2000

Testing the effectiveness of two cryoprotectants (glycerol and ethylene glycol) and two freezing methods (dry ice block freezing and controlled rate freezing) in the cryopreservation of domestic felid spermatozoa. Katherine A. Beltaire, 1999*

M89: Transposon mutagenesis and recombination with *fax*. Lara S. Franco, 1999

Mycobacteriophage L5: Investigation of the integration complex and further characterization of the mIHF binding site. J. Michelle Kahlenberg, 1998*

Generation and characterization of gamma-ray generated M89 alleles. Matthew P. Chandler, 1998

Fine localization and characterization of the M89 gene in Drosophila melanogaster. Jon E. Hess, 1998*

Deficiency and meiotic recombinant mapping of the Drosophila Abl interacting gene M109. N. Reid Perala, 1998*

Genetic experiments exploring the *Abl*:*Disabled* genetic interaction. James Pavelka, 1997.

The search for a suppressor of the *enabled* mutant phenotype. Jason A. Hoppe, 1997.

The mapping and characterization of the M89 mutation in the genome of Drosophila melanogaster. Jennifer A. Cowger, 1997*

Using Drosophila genetics to study signal transduction by the Abl tyrosine kinase. Susan C. Howard, 1996*

The mapping and characterization of the M89 mutation in Drosophila. Angela M. Jackson, 1996*

Detection of a polymorphic microsatellite in the 21-hydroxylase gene region of the horse. Jennifer J. Carlisle, 1995*