Brad Davidson
Box 351800
Department of Zoology
University of Washington
Seattle WA 98195
phone: (206) 543-7029
fax: (206) 543-3041
e-mail: bjd@u.washington.edu

Current Research Interest:

For my thesis work, I am exploring urochordate metamorphosis. Urochordates occupy a critical evolutionary position as non-vertebrate chordates. Therefore the study of urochordate metamorphosis may provide insights into the origins of both chordates and vertebrates. I am employing a number of molecular techniques to gain further insight into urochordate metamorphic signaling. I have carried out a series of subtractive hybridizations aimed at probing the expression of genes immediately prior to and after metamorphosis.
This has led to the isolation of a number of interesting transcripts which match identified genes such as Notch, Complement Factor B, Cornichon, Coronin and alpha-NAC. These genes have well described roles in cell signaling, the immune response, and transcriptional activity. By characterizing the expression and function of these genes in urochordate metamorphosis we are beginning to gain valuable insight into the role of these genes in urochordates as well as the evolution of developmental pathways within the chordates.

Education:

1995 - 2002? Ph.D. Program; Dept. of Zoology, University of Washington, Seattle, Wa.
1991 B.A. in Biology, Swarthmore College, Swarthmore, PA

Honors and Awards:

2000 -2001 NSF PRIME Fellowship (Partnerships for Research in Inquiry-based math, science, and engineering)
1996- 2000 National Research Service Award predoctoral traineeship (NIH)
1998 Company of Biologists Travel Fellowship for research conducted at the Station Biologique, Roscoff, France
1998 Huckabay Fellowship for Development of Innovative Curriculum

Publications

Davidson, B. and Swalla, B.J. (2001) Isolation of genes involved in ascidian metamorphosis: EGF signaling and metamorphic competence, *Genes Development and Evolution* (in Press)

Hodin, J., Hoffman, J., Miner, B. and Davidson, B.J. (2000). Thyroxine and the evolution of lecithotrophic development in echinoids. *Proceedings of the Tenth International Echinoderm Conference* (in press).

Abstracts of Talks Given at Professional Meetings:

Davidson, B., Swalla, B.J. and Moody, W. (2000) "The Role of Thyroid Hormones in Urochordate Metamorphosis" Oral Presentation - Northwest Regional Developmental Biology Conference; Friday Harbor Laboratories; Friday Harbor, WA; March 9-11

Davidson, B.J., Moody, W., and Swalla, B.J. (2000) "Urochordate Cornichon Homologue may play a role in Metamorphic Signalling" Develop. Biol. 222:

238 #96. 2001 **Tunicate Out of Body Experiences: Extra-Somatic Cell Migration and Other**

Abstracts of Posters Given at Professional Meetings:

Insights and Observations on Urochordate Metamorphosis, SICB Conference, Chicago, Ill.

2000 Urochordate *cornichon* Homologue May Play a Role in Metamorphic EGF Signaling, Society for Developmental Biology Conference, Boulder Co.

2000 Investigations into Urochordate Metamorphosis and Post-larval Development Northwest Regional Developmental Biology Conference, Friday Harbor, WA

1999 Thyroid Hormones and Urochordate Metamorphosis, Northwest Regional Developmental Biology Conference, Friday Harbor, WA

1999 Investigations into the Role of Nuclear Receptors in Urochordate Metamorphosis, Graduate Student Symposium, Univ. of WA.

1998 Explorations of Metamorphosis in the Urochordate Boltenia villosa, Graduate Student Symposium, Univ. of WA.

1996 Patch Clamp Investigations of Non-Muscle Cell Types in the Larvae of Boltenia villosa Graduate Student Symposium, Univ. of WA.

Teaching Experiences:

Graduate School

2000 Designer and co-instructor of inquiry based course on Marine Diversity and Conservation, UW Bothell

2000 Comparative Invertebrate Embryology Lab, UW Friday Harbor Labs (TA)

1999 Invertebrate Diversity Lab (TA),

1998 Co-Lecturer for "Animal Diversity" course at Univ. of Washington

1997 Created and taught lab section for Animal Diversity course

1996 Animal Physiology, Investigative Lab (TA)

1996 Introductory Biology, Traditional Lab (TA)

Pre-Graduate School

1991-1992 High School Biology Teacher, Storm King School, Storm King, NY.

1990-1991 Lab Assistant for Neurobiology course, Swarthmore College

Spring 1989 Environmental Education Instructor, Horizons for Youth, Sharon, Mass.

Volunteer

1997-8 Scientist Mentor for Bryant Elementary School Science Fair Projects

1998-9 Assistant Diver / Instructor in various Elementary School Field Trips

Participation in Academic Service

2000 Graduate Student Rep. - Strategic Planning Committee, Dept. of Zoology

1999 Member of Steering Committee involved in applying for PRIME funding

1998 / 2000 Organized Developmental Biology Journal Club, Zoology Dept.

Field Station Experience

2000 (summer) Research on ascidian metamorphosis at Friday Harbor Labs

1998 Research project with Prof. Billie Swalla on muscle development in *Molgula occulta*, Station Biologique, Roscoff, France

1997 Attended course on Invertebrate Embryology, Friday Harbor Labs, Friday Harbor, WA.

1996 Research project with Prof. Dennis Willows on T-PEP expression in *Tritonia* larvae, Friday Harbor Labs, Friday Harbor, Wa.

Research Techniques

Molecular Biology: Trained in RT-PCR, degenerate PCR, RNA isolation, Subtractive Hybridization, Library Screening.

Microscopy: Skilled in the use of Fluorescent, Confocal, and Transmission Electron Microscopes
Embryonic Culture: Skilled in the Identification and Culture of Diverse Invertebrate Organisms
Electrophysiology: Trained in techniques of Patch Clamp recording, including whole cell, perforated patch, single channel inside/out patch, and cell attached methods

Teaching Statement:

I have a longstanding passion for teaching which has strongly influenced my graduate career. Before entering graduate school I taught biology at a private high school, an experience which solidified my desire to teach and to refine my skills as an educator. In my second year of graduate work, I took part in a seminar focused on innovative teaching methods. This course helped me to access other teaching opportunities including designing and co-teaching an inquiry based lecture for a 200 level zoology course. Additionally I have received a Huckabay fellowship in 1998 which enabled me to design and teach an innovative course on Marine Diversity and Conservation at UW. Bothell. This year I have received a NSF PRIME fellowship which will support me while I work to develop and implement inquiry based science education in a local middle school classroom. I will also be conducting research on middle school science education.