

Intertidal Tidings

Newsletter for the Friday Harbor Laboratories • University of Washington • Autumn 2006 • Volume 11

The Center for Cell Dynamics at Friday Harbor Labs

The Center for Cell Dynamics (CCD) at Friday Harbor Laboratories is a National Center for Systems Biology sponsored by the National Institute of General Medical Sciences (NIGMS), a division of the National Institute of Health (NIH). As such, the CCD is the first of seven national centers for excellence established by NIGMS to pursue a specific scientific initiative. Funded by a five year, \$10.7 million dollar grant, the CCD began its initial five-year term at FHL in autumn 2002. With the completion of its new laboratory in April 2004, it was up and running with a full compliment of research scientists, administrative, and computer support personnel. The Center is led by CCD Director, Dr. Garrett Odell.



The big question being explored at the CCD is: How do complex life-like behaviors emerge from the dynamic interactions of simple molecular parts? The challenge modern biologists face today is to figure out how the molecular parts, identified by geneticists and biochemists, conspire to make functional cellular machines. The big problem is how to bridge the parts list (which increasingly includes sophisticated information about structure, regulation, and interactions) and the phenomenology of cellular function. How is it that cell signals and transcriptional regulators create patterns in organisms? How is it that the biochemistry of cytoskeletal polymers and the proteins that interact with them, accounts for protrusions, furrows, flows and so on? In short: How do molecules animate living cells?

The Center's mandate is to cross-train scientists in bench biology and mathematics/computational modeling techniques. CCD's approach is to reconstitute life-like behaviors in silico by adding known facts, chemistry, and mechanics to detailed computer simulations until functional behavior emerges from their sum. The Center integrates simulations with descriptive and experimental bench science to test the extent those systems-level properties are manifest in reality.

CCD researchers make use of the diversity of local marine invertebrates and the ease of maintaining developing embryos in their research. The CCD fosters collaborative interactions by hosting visiting faculty and pre- and post-doctoral research associates. In addition, the CCD sponsors/teaches a yearly undergraduate research apprenticeship course at Friday Harbor Laboratories. The CCD is currently submitting an application for a five-year renewal.



For a detailed description of the research and educational activities going on at the CCD please visit the Center for Cell Dynamics website at www.celldynamics.org.

Adopt a Student Program ...

Adopt-a-Student Program is a Winner!

Our new Adopt-a-Student program matches students in need of financial assistance with donors who appreciate the opportunity for a personal relationship with a student. Forty-one fortunate students from all over the world benefited from this first year's effort. A donation of \$3000 supports one student completely or, depending on need, it may support more than one student.

Sponsors have the opportunity, if they wish, to get to know their adopted students through lunches and other social events. They can learn about the students' research at FHL and understand how the unique FHL experience affects their learning and future aspirations.

The program is a win for students and a win for sponsors.

Comments from students and sponsors:

"Your financial support made it possible for me to study at the UW Friday Harbor Labs this summer. My course in larval biology was a wonderful experience, both in learning and overall and I wanted to thank you. Friday Harbor is a special place and I'm grateful for the time I spent there."



"I am a Ph.D. student from the Netherlands who had the great opportunity to participate in the five week Estuarine and Coastal Fluid Dynamics summer course at FHL thanks to your Adopt-a-Student support!

I would like to share with you that I had an unforgettable and valuable time at the

Friday Harbor Labs! I am a Major in Math and am currently doing a Ph.D. in Estuarine Physics (theoretically), so these five weeks were my very first experience with "real" estuaries.

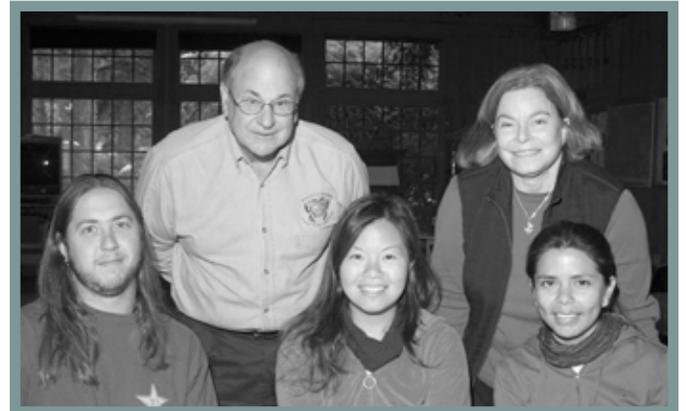
I am very grateful to you for enabling me to have this experience! Thank you!"



"This past summer I had the pleasure of being a host to two students in our new Adopt-a-Student program. During the first session I had a foreign student who is studying to be a dentist. She wants to incorporate her studies at FHL with her ongoing subjects at the UW. I was delighted when she brought her mother, sister, and another lab student out to my home. It was most heartwarming to see how appreciative the whole family was of our program.



In the second session my student had a very busy schedule with frequent trips that took him off San Juan Island. Therefore we were only able to meet for lunch. During this visit I learned how much FHL means to someone from the east coast. Both of these students expressed genuine enthusiasm for our program and appreciation that makes me look forward to repeating this experience next summer."
(Susan Swindells)



"We had three adopted students during the summer and enjoyed getting to know them and hearing each of their very different backgrounds and goals. We were able to appreciate their strong motivation and highly specific global research interests. It was also interesting to observe their research experiments in progress and to be apprised of the results at the end."
(Barbara and George Von Gehr)

I've adopted three students and have enjoyed visiting with them. They are our future. We've had dinners together, tours of the islands and many good visits. I've found our conversations stimulating and interesting. I think about them and sincerely wish them well. This program is positive for both the student and the sponsor. (Chita Miller)

For more information about the Adopt-a-Student program, contact Bob Schwartzberg at rsberg@u.washington.edu or by phone at 360-378-2165 (ext. 2).

FHL Happenings

Marine Life Endowment

by Dennis Willows

FHL has been very fortunate indeed for the steady support of the University of Washington for over a century. However, support to universities nationally is in decline, and training activities like the FHL summer field courses are extremely vulnerable. Universities tend to offer courses that are likely to attract funding from foundations and other special interests, over others that are more basic. Many basic foundational field courses at other institutions serving the national need for world class people in biology and medicine, have disappeared. This raises the urgent question about what will happen to FHL courses long term.

I asked many senior FHL alums to evaluate the impact of FHL courses in invertebrates, algae and comparative invertebrate embryology on their science and their lives. The responses (about 50) are remarkable (<http://depts.washington.edu/fhl/MLE.htm>). The people themselves and their professional lives were even more striking... their scientific work and administrative leadership to a large extent define the modern fields of biology and medicine. Many commented on the direct linkage of their FHL course experience to their professional lives. Please do see the above website, as it is a powerful statement, and represents an aggregate evaluation of several decades of FHL people.

In response, Elizabeth Gladfelter (Betsy authored a book about this phenomenon called *Agassiz' Legacy*, Oxford University Press, 2002.) and I are working to be sure that these courses continue, not just with a stable future, but also with world class quality. This does not come cheap. We friends and alums can and will take care of the FHL foundational courses. I say this with full confidence based on commitments already made. In less than 9 months, alums and friends have committed over 70% of the \$4.5M goal! Now let's get this done.

I ask you to join with us to assure the quality of these courses for the indefinite future. It is painless, and will help generations of students as well as the biological and medical sciences. **Please include the FHL Marine Life Endowment in your Will or make some other kind of long-term commitment that suits you.** Tell us about it so we can include your bequest in our planning. Bob Schwartzberg (rsberg@u.washington.edu) can assist you to do this professionally, and may even be able to arrange a plan that holds some major advantages for you during your lifetime. Thank you very much.

(<http://depts.washington.edu/fhl/MLE.htm>)

People...

- The UW Alumni magazine, Columns, did a feature article on Friday Harbor Laboratories. UW undergraduate, **Hee Sun Kim**, was highlighted in the article. Kim spoke about her 10 weeks in FHL's award-winning Research Apprentice Program noting, "The experience helped us think like a scientist."
- FHL Development Advisory Board (DAB) member, **Dr. William H. Calvin** received the Walter P. Kistler Book Award from the Foundation for the Future for his book *A Brain for All Seasons* at a ceremony held in the Suzzallo Library.
- **Dr. Garrett M. Odell**, UW Professor of Biology and Director of the Center for Cell Dynamics at FHL was a featured speaker at the UW Science Forum. Gary's topic was "For Making Genetic Networks Operate Robustly, Unintelligent Non-design Suffices."
- **Cody Dunagin**, received the award for Best Student Presentation at the National Shellfish Association meeting for his paper that was based on his work in the Fish 492 course at Friday Harbor Labs.
- Cousteau Kids Magazine did a full page "Career in Focus" feature on **Dr. Emily Carrington**, Associate Professor of Biology at FHL. Emily discussed what a marine biologist does, her reasons for becoming a marine biologist and some details about her research on the mechanical design of organisms on the rocky shore.
- The annual FHL Beach Walk was held on the beach at the home of FHL DAB member **Susan Swindells**. This year's Beach Walk was the best attended ever with 80 people participating in walks through the intertidal as well as a special nature walk conducted by **Dr. Eugene Kozloff**.
- The 6th Annual Jazz at the Labs evening to raise money for the FHL K-12 Science Outreach Program featured **Dr. Chris Amemiya's Jazz Coalescence**. Chris, when not moonlighting as a jazz musician, is also a member of the Molecular Genetics Department at the Benaroya Research Institute at Virginia Mason Hospital, a UW Professor in the Biology Department and a FHL Whiteley Scholar. Chris and his band entertained a sell out crowd and enabled FHL raise over \$11,000 for this program in the San Juan Island schools.
- The FHL pilot program '**Host a Student**' program was a great success and will become a regular program year round for FHL students. This program pairs a student scientist at FHL with a host family that provides an opportunity to get to know what life is like on San Juan Island, as well as, to see such sights as Roche Harbor, American and British Camps, the whale watch park at Lyme Kiln, and the host families' favorite places. At the same time, the host family learns about the student scientist's work, research and future plans as well as how they spend their time at Friday Harbor Labs.

More People ...

FHL Research Apprentice Named Rhodes Scholar

The newest UW Rhodes Scholar is an 18-year-old math whiz and an FHL Alum. She plays ultimate frisbee, dabbles in creative writing and started at the UW when she was only 14. **Eliana Hechter** is one of 32 Americans chosen for the prestigious Rhodes Scholarship this past year.

A math major, Eliana was a research assistant at the UW Friday Harbor Laboratories (FHL) Center for Cell Dynamics and a TA for an advanced calculus class. Eliana was also a student in the FHL Research Apprenticeship Program.

Eliana is the 35th UW student to be named a Rhodes Scholar since the first scholarship was awarded to a Washington graduate in 1904. She was chosen from 903 applicants representing 333 colleges and universities.

Eliana entered the University of Oxford in England in October 2006, where she plans to pursue a doctorate in mathematics.

Mary Rice Feted

This past August, over 60 people turned out for a surprise 80th birthday celebration for **Dr. Mary Rice**. In 1966, Mary received her Ph.D. in Zoology from the University of Washington at Friday Harbor Laboratories. She carried out most of her dissertational research at FHL under Dr. Robert Fernald. During her career, Mary was the advisor to 27 post-doctoral fellows and 20 graduate fellows. She retired in 2002 as Director of the Smithsonian Marine Station at Fort Pierce, and remains active as Emeritus Research Scientist there while continuing her research during the summers at FHL. Many students who have completed their Ph.D.'s at FHL have continued their research in post-doc positions with Mary at the Smithsonian Marine Station.

90th Birthday Celebration



Dr. Arthur Whiteley, Professor Emeritus, UW Dept. of Biology, celebrated his 90th birthday December 17th, 2006. A celebration was held at the FHL Dining Hall, December 9th.

Gifts in honor of Arthur can be made to the FHL Marine Life Endowment.

(Call 360-378-2165, ext. 2, for further details.)

The Whiteley Center

The Helen Riaboff Whiteley Center at Friday Harbor Labs provides a refuge for established scholars, not only scientists but scholars in the humanities, arts, music, and just about every field from anthropology to zoology. Scholars may study, write, create, and interact with collaborators in a peaceful and quiet environment. They can work in quiet isolation if they choose or they can take advantage of opportunities to mingle with other Whiteley Center scholars or students and marine scientist at FHL.

Over the past twelve months, the Whiteley Center hosted 111 Whiteley Scholars, some for multiple visits. Some examples of the broad topics of work conducted by these scholars include:

Dr. Penny Chisholm, MIT, biology of marine phytoplankton

Dr. Mark Denny, Stanford, wave forces and dislodgment of intertidal organisms

Dr. Julie Stein, Director UW Burke Museum, archaeology of San Juan Island Historical Park

Dr. Marsh Youngbluth, Harbor Branch Oceanographic Inst., trophic roles of deep water gelatinous zooplankton

Dr. William Calvin, UW, human evolution over the past 2.5 million years

Claudia Mauro, book editing for Whit Press, a nonprofit publishing organization

Rod Dresser and Huntington Witherill, art photography workshop

Dr. Woody Sullivan, UW, Cosmic Noise: A History of Early Radio Astronomy

Dr. Nalini Nadkarni, Evergreen State College, ecosystem ecology of tropical and temperate forest canopies

Dr. Gretchen Lambert, Cal. State University Fullerton, invasive Ascidians of the Pacific NW and Guam

Dr. Mimi Koehl, Univ. of California Berkeley, and Michael Hadfield, U. of Hawaii, behavior of larvae in flow on coral reefs

Dr. Maria Byrne, University of Sydney, AU., evolution of Australian sea-stars (presented annual Illg Lecture)

Dr. George Gilchrist, College of William and Mary, symposium volume on evolvability and adaptation during ecological invasions

Dr. Nancy Farwell, UW, community building among multiethnic residents of public housing in Seattle

Dr. Patricia Campbell, UW, musical development of children

Save the Date

Friday Harbor Laboratories presents
The 7th Annual

Jazz at the Labs
at Friday Harbor Laboratories

Saturday, June 9, 2007

Featuring Dennis Willows and
"The San Juan Jazz Quartet + 1"
and returning by request
Chris Amemiya and Seattle's
Fabulous Jazz Group "Jazz Coalescence"

**Jazz at the Labs supports the
Friday Harbor Laboratories
K-12 science programs in the San Juan Schools**

For information call Bob Schwartzberg
360-378-2165, ext.2

Scholarship / Fellowship Funds

Ellie Dorsey Memorial Fund:

Generates an annual gift presented to a student in memory of Ellie Dorsey.

Patricia Dudley Endowment

Supports the study of systematics and structure of organisms and marine ecology.

Fernald Fellowship Endowment:

Supports graduate students for studies of marine invertebrate development.

FHL Discretionary Fund for Excellence:

Provides funds for student aid and encourages diverse initiatives that benefit FHL.

FHL Research and Graduate Fellowship Endowment:

Supports graduate students and post-docs for marine science studies.

Anne Hof Blinks Fellowship Endowment:

Supports students of diverse backgrounds in marine science studies.

Illg Distinguished Lectureship Endowment:

Brings specialists to present lectures on invertebrate biology and to meet FHL students and researchers.

Kohn Fellowship Endowment:

Supports graduate study of invertebrate biology research and course work.

Marine Life Endowment:

Preserves FHL courses in invertebrates, algae and comparative invertebrate embryology

Marine Science Fund:

A current use fund to provide student aid for courses the following year.

Larry McEdward Memorial Fund:

Provides annual support for a graduate student in memory of Larry McEdward.

Mellon Mentor Endowment for Excellence in Research Training:

Provides faculty salary in support of internship in marine science, matched 1:1 by the Mellon Foundation.

Reed Undergraduate Endowment:

Scholarships to undergraduates for study of marine sciences.

Stephen & Ruth Wainwright Fellowship Endowment:

Fellowships for graduate students studying form and function of organisms.

Dennis Willows Director's Endowment:

Provides future FHL directors with discretionary funds for unbudgeted needs including student assistance.

The Pension Protection Act of 2006: Charitable Gifts from Individual Retirement Accounts

On August 17, 2006, President Bush signed into law the Pension Protection Act of 2006 which includes provisions permitting some taxpayers to make gifts to charity from their individual retirement accounts without adverse tax consequences. Under the old rules, any lifetime distribution of funds from one's IRA was included in one's gross income and therefore taxable. The new law provides an exclusion from gross income of otherwise taxable distributions of up to \$100,000 per donor per year from traditional IRAs and Roth IRAs made during 2006 and 2007 by plan owners who are at least 70½ on the date of the gift to charity.

In a nutshell:

- Donors must be 70½ on the date of the gift
- Funds must be transferred directly to the UW from an IRA or Roth IRA
- Up to \$100,000 per donor may be contributed in 2006 and 2007

How the new law works:

Pat, who is 80, has \$450,000 in her IRA and wants to give \$75,000 to the University of Washington Friday Harbor Laboratories this year. Under the new law she can transfer that amount directly to the UWFHL from her IRA. Though she cannot claim an income tax deduction for this gift, she will not be taxed on the \$75,000 withdrawn and so will suffer no adverse tax consequences by supporting the Friday Harbor Laboratories with a gift from her IRA.

2007 FHL Courses

Spring Quarter 2007 (March 26 - June 2)

The ZooBot Quarter:

- Marine Zoology
- Marine Botany
- Marine Benthic Ecology (Research Apprenticeship)

Other Research Apprenticeships:

- Evolution of Developmental Mechanisms in Marine Arthropods
- Ecology and Development of the Visual System in Marine Fishes

Summer Term A 2007 (June 11-July 14):

- Marine Invertebrate Zoology
- Comparative Embryology of Marine Invertebrates
- Fish Swimming
- Neuroethology: The Neural Basis of Natural Behavior Using an Invertebrate System

- Blinks Marine Science Research Internships (Term A & B)

Summer Term B 2007 (July 16 - Aug.18):

- Marine and Coastal Conservation Science
- Marine Bioacoustics
- Marine Algae
- Larval Biology

Autumn Quarter 2007 (Sept. 24 - Dec. 8):

- Pelagic Ecosystem Function in the San Juan Archipelago
- Animal Behavior, Communication in Sediments and Hydraulic Activities
- Marine Subtidal Ecology
- Gene Network Dynamics and Cellular Behavior

Application and information available at:
<http://depts.washington.edu/fhl/>

Did You Know....

In October, 2006, a new report by a committee advising Congress and the Department of Education revealed that during the current decade, up to 2½ million qualified students, stricken by the costs of higher education, either will be forced to drop out or won't enroll at all.

You can do something about this by making a contribution to Friday Harbor Labs to support deserving students who, without your help, might not otherwise be able to attend.

FHL Contributors ...

We want to thank our many contributors for their kind and generous support of students and programs at FHL. Their interest in, and concerns for marine science are greatly appreciated.

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Lydia Zepeda

Gifts received as of October 2006.

You can make a difference... only if you have a will!

It's been estimated that nearly 2/3 of Americans do not have a will... and many of those that do have a will have not updated it in the past five years.

If you do not have a will, the government may decide who gets your money, property and other assets. It may, depending on circumstances, also decide who raises your kids, cares for your elderly parents, takes care of your pets, decides how much tax your estate pays and it won't make gifts to charities and nonprofits like Friday Harbor Laboratories.

If you have a will, even if you are not wealthy, you can make a gift to the University of Washington, Friday Harbor Laboratories that will have significant impact. A bequest to Friday Harbor Laboratories can be part of your legacy and support students, faculty, programs, a professor – whatever is most important to you. You can donate specific property, a fixed sum, or a portion of your estate, and receive an estate tax deduction for your bequest.

If you wish to make a bequest, please discuss it carefully with your attorney. Our suggested bequest language is: I give, devise, and bequeath to the Board of Regents of the University of Washington, Seattle, Washington, (specific amount, percentage of estate, or property description) for Friday Harbor Laboratories.

As the old saying goes ... "Where there's a Will, there's a way."

For more information, contact:

**Office of Gift Planning, Phone: 206-685-1001 or toll-free at 1-800-284-3679, Email: giftplan@u.washington.edu
Web site: <http://supportuw.washington.edu/giftplanning>**

From the Director's Office...

This month (December) marks my 15th month as director of FHL. During this period we enjoyed probably the busiest year ever at FHL. It has been a pleasure to experience the exceptional students and faculty at FHL, and to work with our very talented and energetic staff on a multitude of projects. Another happy discovery was the constant activity of our Development Advisory Board, their involvement in finding support for FHL students, and planning for the future of this very special place.

Over the past year, faculty at FHL taught a record seven research apprenticeships, and we have the same number planned for next year. The research apprenticeship program is a truly unique experiment, integrating research and education and providing advanced undergraduates and recent graduates with an intense and relevant field or laboratory research experience. Apprenticeships are now providing some of the best available data on oceanographic conditions in the San Juans region, the effect of marine preserves, and important information on behavior, ecology, and evolution of our diverse fauna and flora.

Other courses at FHL also did well last year, with the largest applicant pool in recent lab history. Summer quarter was particularly busy, with a constant buzz of activity from courses and visiting researchers. Housing was full all summer, and lab space was very well used – we were still able to accommodate almost all researchers requesting space for the summer, with some shifting around of time slots. This spring, we will try a new design for the “ZooBot” courses, keeping the traditional Marine Zoology and Marine Botany courses, and adding a mini-apprenticeship in Benthic Marine Ecology to give these students more of a chance to experience field and lab research. The research component has always been part of the ZooBot experience, but now students will get formal credit for it that shows up on their transcript.

Researchers and students at FHL have also been very active in community outreach, an activity that has become integral to the mission of FHL. Our K-12 Program, with two half time staff and several faculty taking part, is doing wonders for local kids. Even the ZooBot undergraduates took part in this program last spring, sharing their new-found knowledge of field sites with several classes. We continue to work closely with the San Juan County Marine Resources Committee to enhance stewardship efforts in the

region, and to provide the type of data needed for this committee, and state agencies, to make decisions regarding marine resources. By replacing Dennis Willows on the MRC this year, I became involved in this process immediately. FHL also established a close working agreement with the San Juan Nature Institute to create an outreach center at FHL, which will continue to provide high quality lectures for the community, workshops and short courses for local adults, and enhancement of K-12 education in the county.



Research activities at FHL continue to change in positive ways. The Center for Cell Dynamics has provided an active year-round research facility (Lab 10) with state-of-the-art computer and microscopy resources. Having this group on campus has certainly made the winters more like the rest of the year. New directions in ecological research are also evident with renovation of the flow lab (Lab 7), addition of a new online weather station (see http://depts.washington.edu/fhl/fhl_wx.html) coupled with studies of how intertidal plants and animals may be adapting to climate change.

This summer, my lab group spent two months installing permanent markers in subtidal habitats just north of the FHL campus, then spent the fall quarter quantifying organism abundance at those 50 sites. We are also installing permanent current meters, wave and tide gauges, and temperature recorders at that site. I hope this will be the start of long-term research to examine changes in the subtidal plants and animals resident in our Marine Reserve areas (we manage five marine reserves, and two terrestrial ones). The long-term physical and biological data collected at these sites should provide the background for experimental and process-oriented research in the future. Not only will we finally know exactly what we have in our reserve areas, but we will also know how those communities are responding to climate change and to human modification of the system.

This has been a year of exciting events, changes, and new directions - and we have more great things planned for the future. I can say unequivocally that I am looking forward to the next year at FHL, and many more after that.



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