Post-Doctoral Research Associate

Department: Center for Cell Dynamics, Friday Harbor Laboratories
Date Available: August 1, 2008. Next recruiting effort for this position may begin in late Spring, 2008.
Open until filled.
Location: Friday Harbor Laboratories (FHL) on San Juan Island, WA

We seek an entry-level post-doctoral associate to join a close-knit research group at the Center for Cell Dynamics, an NIGMS-funded National Center for Systems Biology that promotes the fusion of experimental cell & developmental biology with computational modeling. The Center, located at the University of Washington’s Friday Harbor Laboratories (FHL) on San Juan Island, WA, consists of 20+ full-time scientists including resident and visiting faculty, post-doctoral fellows, and research and support staff. The Center hosts a seminar series, yearly courses, workshops, and other activities. The CCD occupies a 4400 ft.$^2$ building, Lab X, that houses state-of-the-art microscopy and general laboratory equipment resources.

The next great challenge of biology is to figure out how the molecular parts, identified by molecular geneticists and biochemists at an ever-faster rate, conspire together to make functional cellular machines. Our approach is to reconstitute life-like behaviors in silico by adding known facts, chemistry or mechanics, to detailed computer simulations, until functional behavior emerges from their sum (see, for example, von Dassow, Meir, Munro and Odell (2000) Nature 406: 188-192). Our computer models are deeply founded on experimental knowledge and we tightly integrate computer programming with descriptive and experimental bench biology. We seek not only to put the parts together into explanations of whole machines, but also to use the in silico reconstitution to figure out how to complete the empirical explanations when the “parts list” is as yet inadequate. If a computer model exhibits life-like behaviors, we perturb it to generate testable predictions about the real living thing; if it fails, then clearly there’s a missing piece or a mistake, and analysis of the model is used to suggest experiments that might reveal what is lacking from the empirical picture. Realistic computer models can also reveal the design principles according to which evolution has invented molecular machines, and what features of those machines confer robustness, adaptability, evolvability or stability.

We aim to cross-train Center postdoctoral fellows. Our mandate is to support recent PhDs in genetics, cell or developmental biology, in applied mathematics, in relevant engineering science, or in computer science and complement their prior training by giving them the opportunity to develop research skills they don’t yet have. Biology PhD’s will acquire working competence in mathematics and computer programming as they continue experimental investigations of the biological phenomena they wish to model. Math/comp-sci/engineering postdocs will develop experimental research projects while they use their quantitative skills to create and explore models of the biological phenomena. Our center is purposely situated away from the main University of Washington Seattle campus to maximize cross-disciplinary interaction and to facilitate concentration on the hard but exciting work of this emerging field.
Specific research aims. We seek applicants who are interested in expansion and consolidation of five research projects already underway by Center scientists, including development of generally-applicable mathematical formulations and computer methods for coping with molecular biological complexity. These projects concern genetic networks or molecular modules at work to cause: 1) developmental patterning, 2) actin-based propulsion, 3) polarized cell crawling, 4) cytoskeletal reorganizations that cause cytokinesis and related contractile events, and 5) cell rearrangements during morphogenesis. Our group works with \textit{C. elegans, Drosophila}, and a variety of marine invertebrate embryos available from the waters around San Juan Island.

Requirements: The successful candidate will have a Ph.D. and a record of innovative research in one or more of the following areas: genetics, cell or developmental biology, applied mathematics, computer science, or relevant engineering science, and a serious commitment to develop and pursue research fusing experimental cell or developmental biology with computational modeling.

Salary: Based on the annually revised NRSA post-doctoral salary table (plus view), with increases each year.

How To Apply: Interested candidates should submit an application including a cover letter, detailed CV, statement of interests and career goals, three letters of recommendation, and reprints or other documents demonstrating qualifications to:

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To learn more about the Center and its missions visit \url{http://www.celldynamics.org/}. For more information about the University of Washington's Friday Harbor Laboratories on San Juan Island, see \url{http://depts.washington.edu/fhl/}. 