Developmental Biology


A fundamental problem in biology is how the complex set of multicellular structures that characterize an adult animal is generated from the fertilized egg. Recent advances at the molecular level, particularly with respect to the genetic control of development, have been explosive. These advances represent the beginning of a major movement in the biological sciences toward the understanding of the molecular mechanisms underlying developmental decisions and the resulting morphogenetic processes. This new thrust in developmental biology derives from the extraordinary methodological advances of the past decade in molecular genetics, immunology, and biochemistry. However, it also derives from groundwork laid by the classical developmental studies, the rapid advances in cell biology and animal virology, and from models borrowed from prokaryotic systems. Increasingly, the work is directly related to human diseases, including oncogene function and inherited genetic disease.

The Department of Developmental Biology includes a critical mass of scientists who are leading the thrust in developmental biology and who can train new leaders in the attack on the fundamental problems of development. Laboratory labs work on a wide variety of organisms from microbes to worms, flies, and mice. The dramatic evolutionary conservation of genes that regulate development makes the comparative approach of the research particularly effective. Scientists in the department labs have a very high level of interaction and collaboration. The discipline of developmental biology draws on biochemistry, cell biology, genetics, molecular biology, and genomics. People in the department have a major interest in regenerative medicine and stem cell biology.

The department is located in the Beckman Center for Molecular and Genetic Medicine within the Stanford University Medical Center.

Master of Science in Developmental Biology

University requirements for the M.S. are described in the "Graduate Degrees (http://exploredegrees.stanford.edu/archive/2012-13/graduatedegrees)" section of this bulletin.

Students in the Ph.D. program in Developmental Biology may apply for an M.S. degree, assuming completion of their course requirements and preparation of a written proposal. The master’s degree awarded by the Department of Developmental Biology does not include the possibility of minors for graduate students enrolled in other departments or programs.

Students are required to take, and satisfactorily complete, at least three lecture courses offered by the department, including DBIO 210 Developmental Biology. In addition, students are required to take three courses outside the department. Students are also expected to attend Developmental Biology seminars and journal clubs. In addition, the candidate must complete a research paper proposing a specific experimental approach and background in an area of science relative to developmental biology.

Doctor of Philosophy in Developmental Biology

University requirements for the Ph.D. are described in the "Graduate Degrees (http://exploredegrees.stanford.edu/archive/2012-13/graduatedegrees)" section of this bulletin.

The graduate program in Developmental Biology leads to the Ph.D. degree. The department also participates in the Medical Scientists Training Program (MSTP) in which individuals are candidates for both the M.D. and Ph.D. degrees.

Students are required to complete at least six courses, including:

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<thead>
<tr>
<th>Course</th>
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<tr>
<td>DBIO 210</td>
<td>Developmental Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOS 200</td>
<td>The Nucleus</td>
<td>8</td>
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<tr>
<td>DBIO 215</td>
<td>Frontiers in Biological Research</td>
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An advanced molecular biology, biochemistry, or biophysics course

Students are expected to attend Developmental Biology seminars and journal clubs.

Completion of a qualifying examination is required for admission to Ph.D. candidacy. The examination consists of two parts. One proposal is on a subject different from the dissertation research and the other proposal is on the planned subject of the thesis. The final requirements of the program include presentation of a Ph.D. dissertation as the result of independent investigation and constituting a contribution to knowledge in the area of developmental biology. The student must pass the University oral examination, taken only after the student has substantially completed research. The examination is preceded by a public seminar in which the research is presented by the candidate. The oral examination is conducted by a dissertation reading committee.

Emeriti: (Professors) David S. Hogness, A. Dale Kaiser
Chair: William Talbot
Associate Chair: tba
Professors: Ben Barres, Philip Beachy, Gerald Crabtree, Margaret Fuller, Seung Kim, Stuart Kim, David Kingsley, Roeland Nusse, Matthew Scott, Lucy Shapiro, William Talbot, Anne Villeneuve, Irving Weissman
Assistant Professors: Maria Barna, Gill Bejerano, Joanna Wysocka
Associate Professor: James Chen
Professor (Teaching): Ellen Porzig
Professor (Research): Harley McAdams