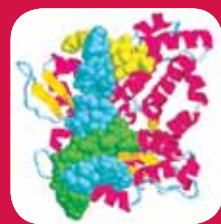


Stanford University



Graduate Studies in the Biosciences

<http://biosciences.stanford.edu/>

Graduate Studies in the Biosciences at Stanford University

The Biosciences programs at Stanford provide an outstanding opportunity for education and research with more than 350 faculty members as well as with other outstanding graduate students, postdoctoral fellows, and undergraduates. The opportunity to affiliate with any Biosciences faculty member for dissertation research is uniquely balanced by the Home Program structure, in which each student joins a closely knit group of faculty and students in one of the 13 Biosciences programs spanning the Schools of Medicine and Humanities & Sciences. Information about the research interests of the Biosciences faculty can be found on the Biosciences web site at <http://biosciences.stanford.edu/> and in the Community Academic Profiles at <http://med.stanford.edu/profiles>. For further details about any of the Home Programs, please contact the person listed in this brochure.

The graduate programs in Bioengineering and in Stem Cell Biology and Regenerative Medicine are also described in this brochure, although they are administered separately. Additional information about these programs can be found at <http://med.stanford.edu/phd/>.

The Home Programs

The goal of the Home Programs is to allow each graduate student to receive his/her training within a relatively small and cohesive group of faculty, students, and postdoctoral fellows who share common scientific interests and intellectual approaches. This avoids the anonymity that large and diffuse global admissions and training programs can create. Each student is admitted to a particular Home Program, which then provides the primary base for training during the first year. Nevertheless, many students are interested in the research of faculty across a range of disciplines, spanning multiple departments and programs, and student interests often evolve during the first year in response to their experiences in formal courses and seminars, lab rotations, and informal interactions with faculty and students in different programs. The Biosciences programs at Stanford encourages students to explore research opportunities, do rotations, and eventually decide on dissertation research in any of the 13 Home Programs.

During the first year at Stanford, Biosciences graduate students carry out laboratory research rotations in several laboratories to help them learn about different areas and styles of research and ultimately make informed laboratory choices for dissertation research. Students may do rotations entirely within the original Home Program or may take advantage of the wide range of opportunities at Stanford: a student may work in any Biosciences laboratory, subject only to space constraints and consent of the faculty member. Each student's first rotation during Autumn Quarter is usually in one of the laboratories of the Home Program. During this time, students also settle into graduate life, take formal coursework (based on their interests, backgrounds, and Home Program), and attend faculty research presentations,

seminars by local and visiting speakers, journal clubs, research retreats, and symposia both within and outside the Home Program. Based on these experiences, input from the Home Program's graduate advisors, and discussions with other faculty and current students, the student meets with faculty of interest to arrange subsequent laboratory rotations. Typically, more than half of first-year students do at least one rotation with faculty outside their Home Program. This flexible system for rotation selection not only provides students with exposure to a range of laboratories for potential dissertation research but also broadens their knowledge of the many ongoing projects and resources available at Stanford. Indeed, it is common in later years to obtain help from, or even engage in collaboration with, a former rotation laboratory.

The choice of laboratory for dissertation research is typically made at the end of the second or third quarter in residence but is sometimes postponed to allow an additional lab rotation. Emphasis is on allowing each student, in consultation with his/her academic advisors, to feel comfortable that an appropriate choice has been made. The choice is a joint decision between the student and the prospective faculty thesis advisor. When this advisor is outside the student's original Home Program, the student can transfer into a new Home Program with which the thesis advisor is affiliated or stay within his/her original Home Program. This decision is made jointly by the student, the thesis advisor, and the graduate advisors in the respective Home Programs, with optimization of the student's training as the primary consideration.





Biosciences at Stanford and Beyond

The Biosciences programs offer each student a wide range of choices, while also ensuring that s/he is integrated into a cohesive academic community both immediately upon entering the graduate program and at each stage thereafter. The increasingly clear interrelationships among areas of biology and the biomedical sciences that were previously viewed as distinct make it all the more important for students to do research in an interactive and cooperative research environment. Cross-disciplinary research and training has always been a great strength of the Biosciences programs at Stanford. All of the science and engineering departments are located in close proximity to one another on a single campus, fostering interactions and collaborations not just between groups formally in the biosciences, but also often extending to chemistry, physics, psychology, computer sciences, and chemical, electrical, material, and civil engineering. Beyond the Stanford campus, the San Francisco Bay Area has an extraordinarily broad and deep range of biological, biomedical, and other scientific and technical knowledge and expertise. The rich scientific environment fosters regular meetings of special interest groups that include scientists both from Stanford and from UC San Francisco, UC Berkeley, UC Santa Cruz, and other nearby institutions along with the major biotechnology, pharmaceutical, and technology companies of Silicon Valley.

Stanford's traditional freedom of inquiry and entrepreneurial spirit, coupled with the freedom provided by the Biosciences programs for students to explore and move among diverse academic fields and programs, provide an unsurpassed opportunity to obtain the best possible graduate education.

Life at Stanford

Many graduate students choose to live on campus in student housing. Others live just a bicycle ride away in the neighboring towns, which boast local theater companies, independent movie houses, bookstores, shops, and a wide variety of ethnic restaurants. Less than an hour away, San Francisco, Berkeley, and San Jose offer an extraordinary array of cultural, intellectual, and social opportunities.

Of the 8,180 acres that comprise the Stanford campus, some 5,200 acres are in academic use; the remainder stretch westward into the foothills of the Santa Cruz Mountains. Half an hour to the west are the beaches of the Pacific Ocean; a few hours to the east are the Sierras, with extraordinary opportunities for hiking, camping, skiing, and other outdoor activities. Monterey Bay and Big Sur, less than two hours to the south, are favorite weekend retreats, as is the lush, wine-making region of Napa Valley, just two hours to the north. These attractions, the exceptionally pleasant climate, and the exceptionally stimulating academic environment draw people to Stanford from all over the world. More information about all aspects of campus life can be found at http://med.stanford.edu/student_life/.

Applying to the Biosciences Programs

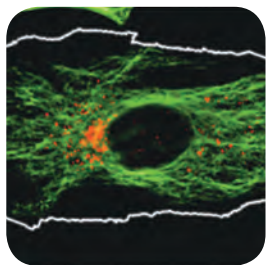
The Biosciences programs at Stanford allow an applicant to apply to up to three Home Programs with a single application. Admission to one program allows subsequent access to any of the 13 Home Programs in the Biosciences. Please visit the Biosciences web site at <http://biosciences.stanford.edu/> for information about the application process and deadline, required supporting documents, and other important admissions information.

Biosciences Ph.D. Admissions
Stanford University
1265 Welch Road, MSOB X2C34
Stanford, CA 94305-5421
(650) 723-2460
(650) 725-3867 (fax)
biosci@stanford.edu
<http://biosciences.stanford.edu>

Diversity at Stanford University

Stanford University and the Biosciences programs believe that a student body that is both highly qualified and diverse in terms of gender, race, ethnicity, cultural and socioeconomic background, and work and life experiences is essential to an optimal educational process and to building a more just and healthy society. Thus, Stanford actively pursues diversity in all its Schools and Programs and at all levels of higher education. The Biosciences programs are committed to training students from diverse backgrounds for careers in the biological and biomedical sciences, and the promotion of diversity in education through outreach and mentorship programs is a key facet of the strategic plans of both the School of Medicine and the School of Humanities & Sciences. For more information about Stanford Biosciences' efforts and initiatives focused on enhancing diversity in graduate education, please visit <http://med.stanford.edu/phd/diversity/>.

Biochemistry

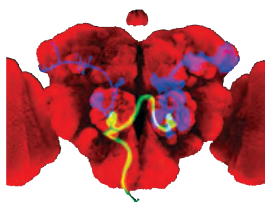


The Biochemistry program trains students to elucidate the molecular basis of biological processes. We seek to develop leaders and innovators in fundamental molecular research and biotechnology. We teach students to identify important but poorly understood biological problems and processes and equip them with experimental and analytical skills and the confidence to address them, including when necessary development of enabling molecular technologies to allow new levels of exploration. After research rotations and foundational coursework tailored to each student's background and interests, intensive thesis research is carried out in a collaborative environment in which space and equipment are shared by all research groups. This sharing promotes interactions and exchanges of methods and ideas that facilitate interdisciplinary training and spawn new research directions, which have included molecular biology, functional genomics, and single molecule revolutions, as well as many fundamental breakthroughs in biochemistry, cellular, molecular, and developmental biology.

For more information:

Joella Ackerman
Department of Biochemistry
Beckman Center, B400
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(650) 725-9058
(650) 723-6783 (fax)
joella.ackerman@stanford.edu
<http://biochem.stanford.edu/>

Biology



The mission of the Department of Biology is to mentor and educate students at the undergraduate, graduate, and post-doctoral levels. Scientific interactions between research groups are fostered through an annual retreat, a weekly seminar series, and weekly research presentations. To accommodate the broad range of student interests, three distinct academic tracks are offered for graduate study:

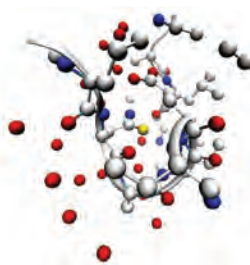
- Cell, Molecular, Developmental, and Plant Biology: protein folding and turnover, nuclear transport, regulation of the cell cycle and cytoskeleton, intracellular signaling, development and function of the nervous system, plant-microbe interactions, and plant development
- Integrative, Organismal, and Marine Biology: thermoregulation, sensory transduction, development, behavior
- Ecology, Evolution and Population Biology: ecology, biodiversity, adaptation, evolution, conservation biology

Research sites include Hopkins Marine Station, Jasper Ridge Biological Preserve, and the Carnegie Institution of Washington's Departments of Plant Biology and Global Ecology.

For more information:

Student Services
Department of Biology
Gilbert Building, Room 108
371 Serra Mall
Stanford, CA 94305-5020
(650) 723-1826
(650) 723-6132 (fax)
biologyadmissions@stanford.edu
<http://biology.stanford.edu>

Biomedical Informatics

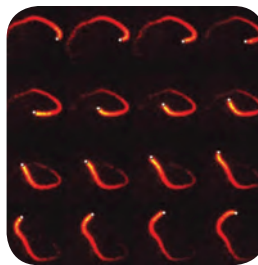


The mission of the Biomedical Informatics (BMI) training program is to provide graduate training in the application of information technologies to problems in biomedical research. The focus of the training is on the creation, validation and application of novel methods for capturing, representing, storing, retrieving, visualizing and analyzing biomedical data and knowledge. The BMI program, founded in 1982, broadly encompasses the areas of bioinformatics, translational informatics and clinical informatics. Trainees learn to work and communicate effectively at the intersection of contributing disciplines, including biology, medicine, computer science, statistics and the decision sciences. Stanford provides an extraordinary environment to pursue interdisciplinary education in the development of novel informatics methodologies with applications spanning the full range of biomedicine. The faculty in biomedical informatics is drawn from the schools of medicine, engineering and humanities & sciences. The rigorous core curriculum introduces students to computational representations and algorithms relevant to problems in modern biomedical research. Students also receive solid training in computer science, mathematics, statistics and engineering to complement their research.

For more information:

Biomedical Informatics
1265 Welch Road
MSOB X215
Stanford, CA 94305-5479
(650) 723-1398
(650) 725-7944 (fax)
bmi-contact@lists.stanford.edu
<http://bmi.stanford.edu>

Biophysics

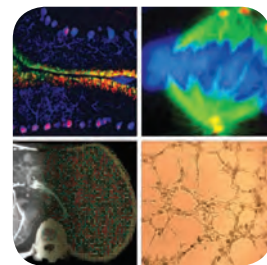


Faculty in the Biophysics program share a common interest in understanding the physical principles that underlie biological phenomena. Research in the program involves two overlapping branches of biophysics: the application of physical and chemical principles and methods to solving biological problems, and the development of new methods. Research areas include the molecular basis of macromolecular function including structural biology, single molecule analysis, and computational biology; the quantitative relationships between molecular properties and higher-level cell and tissue properties; and emerging areas of quantitative cell and organ biology. Methodologies include imaging at all biological scales: single-molecule analysis; x-ray diffraction, electron microscopy, NMR, and other spectroscopic methods for determining three-dimensional structure; and cellular and tissue-level MRI. The training program includes graduate-level coursework in physical and biological sciences, participation in seminar series, and, most importantly, independent research.

For more information:

Kathleen Guan
Biophysics Program
Fairchild Building, D118
Stanford, CA 94305-5126
(650) 723-7576
(650) 723-8464 (fax)
biophysics@med.stanford.edu
<http://med.stanford.edu/biophysics>

Cancer Biology

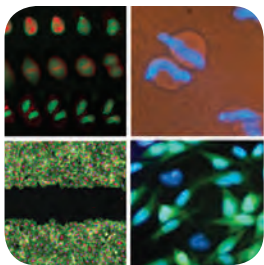


As one of the oldest interdisciplinary graduate training programs in the nation, the Stanford Cancer Biology program is dedicated to train a future generation of cancer researchers who can translate basic scientific findings into modern cancer diagnostics and treatments. Our program includes over 70 faculty members drawn from 25 different clinical and basic-science departments. Our students conduct research in basic, translational, and clinical aspects of cancer such as oncogenes and tumor suppressor genes, DNA damage and repair, angiogenesis, tumor hypoxia, tumor immunotherapy and vaccines, tumor profiling, and cancer stem cells. Coursework during the first year is designed to provide a broad understanding of the molecular, genetic, cell biological, and pathobiological aspects of cancer. Students also learn about the current state of clinical diagnosis and treatment of human cancers. Each student must conduct three rotations before selecting a thesis laboratory. A qualifying examination must be completed by the end of the second year.

For more information:

Grace Kolar
Program Administrator
Stanford Cancer Institute
265 Campus Drive, G2103F
Stanford, CA 94305-5456
(650) 723-6198
(650) 736-0607 (fax)
<http://cancerbio.stanford.edu/>

Chemical and Systems Biology



Understanding biology at the molecular and systems levels requires new approaches to biomedical research, including the integration of quantitative, chemical, and biological methods. The next generation of scientists must be capable of bridging these diverse disciplines. Stanford faculty who share this vision have created this training program as an inter-Departmental and inter-School initiative that provides graduate students with interdisciplinary research opportunities in the biological sciences.

Faculty, students, and postdocs in the Chemical and Systems Biology training program share an interest in the molecular aspects of cellular and organismal regulation, the quantitative analysis of cellular regulatory systems, and the development and application of comprehensive chemical and genetic tools for perturbing and probing regulatory networks. The program and its associated faculty are committed to leading Stanford's research efforts at the chemistry/biology interface.

For more information:

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CCSR Room 3155
Stanford, CA 94305-5174
(650) 725-5091
(650) 723-6834 (fax)
urbano@stanford.edu
<http://casb.stanford.edu>

Developmental Biology



Research in the Department of Developmental Biology is aimed at understanding how single cells develop into complex organisms. Within that context, many aspects of developmental and cell biology are explored, including cell communication, gene regulatory networks, and the genomic basis of evolution. The general goals include understanding how cells work together to build organisms and how the structure of organisms is controlled by the genome. Areas of interest include mysteries of embryonic growth, stem cells, signaling, gene regulation, organogenesis, evolution and the origin of new species, and microbial genetic circuitry. The field of developmental biology is fundamentally integrative. In trying to understand how cells coordinate their activities to form a working organism we employ genetics, genomics, imaging, biochemistry, transgenesis and advanced microscopy. Many research projects are related to mechanisms of disease, including cancer, diabetes, and neural degeneration.

For more information:

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(650) 725-7739 (fax)
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<http://devbio.stanford.edu>

Genetics

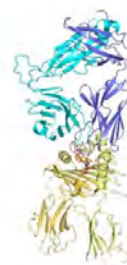


The Department of Genetics provides opportunities for Ph.D. study in a broad array of areas overlying a consistent intellectual framework. All major areas of modern genetics are represented in the Department, including identification and analysis of human disease genes; molecular evolution; host-pathogen/symbiont interactions; gene therapy; statistical genetics; application of model organisms to problems in biology, medicine, and environmental conservation; and computational and experimental approaches to genome biology. An underlying theme in our Department is that genetics is not merely a set of tools but a coherent and fruitful way of thinking about biology and medicine. To this end, we emphasize a spectrum of approaches based on molecules, organisms, populations, and genomes. We provide training through laboratory rotations, dissertation research, seminar series, and didactic and interactive coursework. The mission of the Department includes education and teaching as well as research; graduates from our program pursue careers in many different venues including research in academic or industrial settings, health care, health policy, and education.

For more information:

Graduate Program
Administrative Associate
Department of Genetics
300 Pasteur Drive
Lane Building Rm. 329
Stanford, CA 94305-5120
(650) 723-3335
(650) 725-7016 (fax)
genetics-info@genome.stanford.edu
<http://genetics.stanford.edu>

Immunology



The Interdepartmental Ph.D. Program in Immunology provides a state-of-the-art research environment in both basic and clinical immunology. In basic immunology, fundamental molecular and cellular processes are studied in the development, regulation, and functions of immune cells, including T- and B-lymphocytes, natural killer cells, and dendritic cells, and the specific tissues and organs that contribute to innate and adaptive host defenses. On the clinical side, immune system cells and factors that participate in the regulation of immunologic and non-immunologic processes with direct relevance to disease are studied. Translational research – including studies of the human immune system and diseases – are increasingly emphasized. The Immunology Ph.D. curriculum includes first-year coursework and rotations, seminars and a scientific retreat, and excellent opportunities for speaking, teaching, and research collaborations. Currently, 57 program faculty, 51 graduate students, and 100 postdoctoral fellows constitute an important component of Stanford Immunology.

For more information:

Maureen Panganiban
Immunology Program Administrator
1215 Welch Road
Modular B, Room 55
Stanford, CA 94305-5422
(650) 725-5076
(650) 725-2628 (fax)
mopan@stanford.edu
<http://immunol.stanford.edu>

Microbiology and Immunology

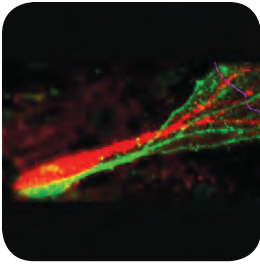


Faculty in the Department of Microbiology and Immunology study how hosts interact with microbes. They investigate how microbes cause disease and contribute to our well-being as well as how our immune system both protects us and causes us harm. They investigate both sides of the host-pathogen interaction and teach students the cross-disciplinary tools required to dissect such problems. Pathogens are used as probes of the host cell in addition to their use as tools to explore basic biological mechanisms. Regulation at the levels of transcription, translation, and metabolism is actively investigated in all systems. Faculty study viruses, bacteria, and protozoans in hosts ranging from flies to humans. Immunological effector arms under investigation include: cytotoxic T-cells, helper T-cells, gamma delta T-cells, B-cells, macrophages, and natural killer cells. The Department provides courses in microbial pathogenesis, advanced immunology, and technology. The seminar series features invited visitors, students, and postdocs, and the annual retreat includes presentations by students and postdocs from all research groups.

For more information:

Student Services
Department of Microbiology and Immunology
299 Campus Drive
Fairchild, D300
Stanford, CA 94305-5124
(650) 725-8541
(650) 721-1648 (fax)
micro_immuno@lists.stanford.edu
<http://microimmuno.stanford.edu>

Molecular and Cellular Physiology

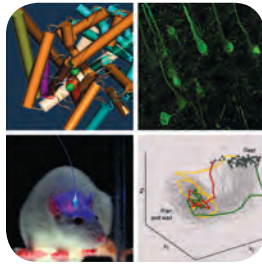


The faculty of the Department of Molecular and Cellular Physiology share a common interest in the molecular mechanisms of cell signaling and behavior. A central goal of physiology in the post-genomic era is to understand how thousands of encoded proteins serve to bring about the highly coordinated behavior of cells and tissues. Research in the department approaches this goal at many levels of organization, ranging from single molecules and individual cells to multi-cellular systems and the whole organism.

In addition to a major emphasis on laboratory research, the graduate training program offers graduate-level courses in cell biology and physiology, synaptic transmission, ion channels, transmembrane signal transduction, and advanced microscopy; seminars by outside speakers; research seminars by departmental faculty, graduate students, and postdocs; and an annual 3-day retreat with research presentations by all departmental laboratories.

For more information:
Schantae Wright
Department of Molecular and Cellular Physiology
Beckman Center, B100
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(650) 725-7554
(650) 725-8021 (fax)
schantae@stanford.edu
<http://mcp.stanford.edu>

Neurosciences



Study of the neurosciences involves many pressing biological questions: learning and memory, the molecular and cellular basis of intracellular and intercellular communication, how genes control development and behavior, how neuronal networks impact perception and consciousness, and the etiology and treatment of epilepsy, schizophrenia, and Alzheimer's disease. The Stanford neurosciences faculty is renowned for its leadership in molecular neurobiology, signal transduction, cellular and developmental neurobiology, electrophysiology, systems and sensory neurobiology, the neurological and behavioral sciences, and computational neuroscience. The Neurosciences Ph.D. Program is a cohesive interdisciplinary program, and formal coursework is designed to provide students with a solid foundation in several areas of neuroscience that can be built upon with more advanced courses. Requirements and training are tailored to the research interests of the student. Effective communication skills, grant writing, job hunting, and responsible conduct are also addressed during a weekly forum.

For more information:
Ross Colvin
Neurosciences Program
Administrator
1215 Welch Road
Modular B, Room 42
Stanford, CA 94305-5400
(650) 723-9855
(650) 721-6434 (fax)
larkspur@stanford.edu
http://neuroscience.stanford.edu/education/phd_program/

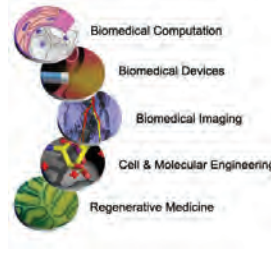
Structural Biology



Students in the Department of Structural Biology study a wide range of problems from a structural and mechanistic perspective. Research topics include the mechanisms of transcription and translation, chromatin structure, the mechanisms of antibiotic resistance, protein-RNA interactions, catalytic RNA, molecular chaperones, cell membrane recognition, cellular adhesion, evolution and mechanism of the immune response, and theoretical studies of protein structure and dynamics. A broad spectrum of biophysical techniques, including x-ray crystallography, NMR, electron microscopy, and computational methods is represented in the department. The graduate program strongly emphasizes research training. Students design their course programs, typically a combination of specialized courses and core advanced courses in structural biology, biochemistry, genetics, and cell biology, to meet their educational goals. Students participate in an annual retreat that features research presentations by all the groups in the department. In addition, students attend seminar programs sponsored by the various Biosciences programs.

For more information:
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(650) 723-7576
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structuralbio@med.stanford.edu
<http://structuralbio.stanford.edu>

Bioengineering

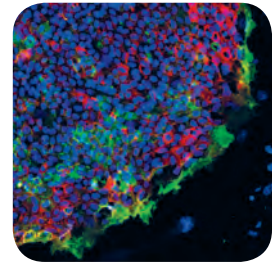


Independent of the 13 Biosciences Home Programs

The Department of Bioengineering is jointly supported by the Schools of Medicine and Engineering. The Department's mission is to create a fusion of engineering and the life sciences that promotes scientific discovery and the development of new biomedical technologies and therapies through research and education. The facilities and personnel of the Department of Bioengineering are housed in the James H. Clark Center, William F. Durand Building for Space Engineering and Science, William M. Keck Science Building, the Jerry Yang and Akiko Yamazaki Environment and Energy Building, and the Richard M. Lucas Center for Magnetic Resonance Spectroscopy and Imaging. Research and educational thrusts include biomedical computation, biomedical imaging, biomedical devices, regenerative medicine, and cell and molecular engineering. The clinical dimension of the department includes cardiovascular medicine, neuroscience, orthopedics, cancer care, and neurology.

For more information:
Olgalydia Urbano-Winegar
Student Services Manager
Department of Bioengineering
318 Campus Drive
Clark Center S166
Stanford, CA 94305-5444
(650) 723-8632
(650) 721-3088 (fax)
bioengineering@stanford.edu
<http://bioengineering.stanford.edu>

Stem Cell Biology & Regenerative Medicine



Independent of the 13 Biosciences Home Programs

The Stanford Stem Cell Biology and Regenerative Medicine (SCBRM) program is dedicated to doctoral education that translates basic science to clinical applications, typically referred to as Translational Science and of intense interest internationally in medical schools and universities. Stem Cell Biology and Regenerative Medicine is cross-disciplinary with advances linked to embryology, developmental and cell biology, neurosciences, cardiovascular biology, genetics, clinical medicine, bioengineering, engineering and computer sciences. Our core curriculum is combined with unique research and clinical/professional immersion rotations to provide opportunities for doctoral students to specialize in the broad subject of translational medicine and yet focus specifically on fundamentals of SCBRM. The curriculum combines education in genetics and developmental biology with an introductory laboratory-based stem cell course, an advanced course in stem cell biology and regenerative medicine, and a clinical rotation with alternative opportunities in law, business and/or engineering.

For more information:
Stem Cell Ph.D. Program
Office
Institute for Stem Cell Biology and Regenerative Medicine
265 Campus Dr., Rm. G3021
Stanford, CA 94305-5463
(650) 723-6716
(650) 736-2961 (fax)
stemcellphd@stanford.edu
<http://stemcell.stanford.edu/>