

The Division of
Biological Sciences
Graduate Programs

About Us

Our graduate students and postdoctoral trainees play a pivotal role in the research and education missions of the Biological Sciences Division (BSD). We are immensely proud of our long history of trainee research excellence and of the notable achievements of our alumni. Our trainees benefit from immersion within one of the world's great research universities, but of equal importance, our faculty benefit from the opportunity to collaborate with young scientists who bring to our institution the brightest of minds, unbridled enthusiasm, and a panoply of fresh ideas. The University of Chicago famously embraces the life of the mind; through graduate student and postdoctoral training we celebrate the transformative power of ideas and the opportunity to make a difference.



Victoria E. Prince, PhD
Dean and Director
Office of Graduate and Postdoctoral Affairs



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Hyde Park and Chicago

Hyde Park & Chicago

Growing, changing, ever-evolving, yet deeply rooted in tradition, our neighborhood is alive with history. **Hyde Park** is home to lifelong residents, diverse ideas, beautiful vistas, and thriving culture, not to mention affordable **housing** and great **amenities and attractions**.

On the shores of Lake Michigan in the heart of the Midwest, Chicago is home to world-championship sports teams, an internationally acclaimed symphony orchestra and opera, renowned architecture and much more. Visitors to Chicago experience a virtual explosion of cultural activity, civic pride and multicultural expression.

From stunning architecture and world-famous museums to lakefront parks and vibrant ethnic neighborhoods, Chicago offers an endless variety of places to explore and things to do. There are museums of every kind; avant-garde art galleries; dance, theater, and music venues; plus ethnic and cultural riches in food, music, and shopping. The new Millennium Park, Northerly Island, and Navy Pier provide added attractions for the lakefront, with restaurants, concert venues, theatres, art exhibits, world-class museums, shopping and other amusements within walking distance of downtown and public transportation.

Chicago is one of the world's most important financial and trading centers and is home to major high-tech industries, replacing the old livestock and heavy steel industries of generations ago. Yet despite being one of the largest cities in the United States, Chicago retains its charm because it is still a city of diverse neighborhoods, from the color of the New Year festival in Chinatown to the taquerias of the Pilsen neighborhood and the tandooris of Devon Avenue.

Learn about Chicago and all its great neighborhoods, including Hyde Park, with a variety of mobile apps at [Explore Chicago](#).



The University

Located in the community of Hyde Park on Chicago's South Side, just 15 minutes from the city center, the University of Chicago is uniquely positioned to contribute to and draw from the strength and diversity of this world-class metropolis. We have also made an indelible mark on the world at large.

Students

5,692 undergraduate students
9,502 graduate, professional, and other students

Faculty

2,190 faculty
89 Nobel Prize winners, including 7 current faculty

Alumni

More than 177,000 alumni worldwide

Research

\$450 million in sponsored research awards
More than 3,300 patents filed since 1987
Manager of Argonne National Laboratory and
Fermi National Accelerator Laboratory (in partnership);
also affiliated with the Marine Biological Laboratory

Arts & Culture

Professional museums, theater, concerts, and lectures
A multitude of student-run organizations and events

Campus

215 acres in Chicago's Hyde Park neighborhood on Lake Michigan. It was designated a botanic garden in 1997, with a blend of traditional English Gothic and award-winning modern buildings designed by renowned architects

Undergraduate College

Offering 50 majors and 29 minors

Four Graduate Divisions

Biological Sciences
Humanities
Physical Sciences
Social Sciences

Six Graduate Professional Schools

Divinity School
Chicago Booth School of Business
Law School
Pritzker School of Medicine
Harris School of Public Policy Studies
School of Social Service Administration

Continuing Education

Graham School of Continuing Liberal and Professional Studies offering degree, certificate, and open enrollment programs



Faculty

The 881 faculty members in the Biological Sciences Division form the clusters of degree-granting basic science units, the clinical departments and committees, the Howard Hughes Medical Institute, the University of Chicago Medicine Comprehensive Cancer Center, and several specialized research centers. These faculty are involved in all aspects of biological research and teaching. Currently, around 175 faculty serve as advisers to PhD students.

Many of the faculty have been distinguished by their selection for advisory or editorial positions by national and international scientific organizations, including the National Institutes of Health, the National Science Foundation, the American Cancer Society, and the Leukemia Research Foundation. Forty-two of UChicago's faculty are members of the National Academy of Sciences, several are Fellows of the American Academy of Arts and Sciences, and eight faculty members have received the National Medal of Science.



UNIVERSITY POLICIES



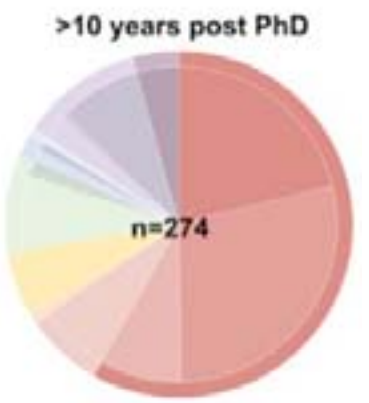
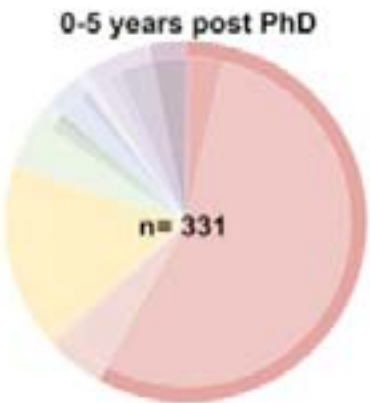
The Student Body

Students in the PhD programs of the basic sciences number over 400 and come from all parts of the country and five continents. The diverse student body includes groups of people traditionally underrepresented in science.

The average time to completion of the PhD degree in the graduate programs is 5.5 years. Because of the traditions of the University of Chicago and the close relationship between the graduate program disciplines and the medical sciences, twenty percent of the graduate students obtain both the PhD and the MD degrees.

Many of the graduates of the programs pursue academic research careers. A recent trend has begun to also demonstrate that a substantial number choose other careers that make good use of their science training in areas including biotechnology, the pharmaceutical industry, business and technology commercialization, policy, science communication, research administration, and law. Statistics on career placement of BSD alumni are provided on the right.

Career Categories (IDP)	Broad Career Area
Principal investigator in a research-intensive institution	Academic Research
Combined research and teaching careers	
Research staff in a research-intensive institution	
Research in industry	Industry: Pharma/Biotech
Scientific/medical testing	Technology Commercialization
Drug/device approval and production	
Entrepreneurship	Entrepreneurship
Clinical practice	Medicine & Healthcare
Business of Science	Business of Science
Sales and marketing of science-related products	
Support of science-related products	
Intellectual property and Tech transfer	Law, Policy/Regulatory
Public health related careers	
Science Policy	
Science writing	Science Communication
Science education for non-scientists	Teaching
Science education for K-12 schools	
Teaching-intensive careers in academia	
Clinical research management	Research Administration
Research Administration	



UNIVERSITY POLICIES



Diversity and Inclusion

UChicago is a multicultural, international community of more than 15,000 students and 20,000 faculty and staff, each supporting the university's mission of inquiry and academic excellence. **Diversity** is central to our mission of discovery as it drives ideas, builds careers, and enriches communities. Having the greatest number of representatives from the most diverse pool of thinkers poses the most likely opportunity to address a problem from all its perspectives. The Biological Sciences Division is committed to attracting, mentoring, and promoting a diverse community of scholars in an environment conducive to excellence for students from all backgrounds.

The University strives to be supportive of the academic, personal, and work-related needs of each individual. UChicago is committed to facilitating the full participation of students with a disability in the life of the University. **Student Disability Services** works to provide resources, support, and accommodations for all students with disabilities and to remove physical and attitudinal barriers, which may prevent their full participation in the University community.

The Graduate Minority Committee, with thirty-four faculty members, administrators, and students, works to enhance diversity in the BSD. The GMC promotes social, cultural, and scientific interactions, as well as awareness of minority issues. It also provides administrative student support, educational and mentorship programs, and networking opportunities. Finally, the GMC endeavors to ensure and increase the availability of funds for minority programs.

The student-led **Multicultural Graduate Community** (MGC) seeks to empower individuals to promote the engagement and success of underrepresented communities in the sciences. By providing academic and personal support networks, resources for professional development, and student mentorship, the MGC embraces diversity and helps foster a united community capable of addressing the needs of underserved and underrepresented minority groups.

UChicago also hosts a chapter of **SACNAS**, the Society for Advancement of Hispanics/Chicanos and Native Americans in Science, a national organization committed to advancing the achievement of underrepresented STEM students by building opportunities, diversifying the field, and developing future leaders. SACNAS is inclusive of all ethnicities, cultures, and scientific disciplines, and is deeply committed to the highest standards of excellence in science and education.



UNIVERSITY POLICIES



Current Students



When deliberating between the University of Chicago and several other graduate programs for my degree in Evolutionary Biology, I thought a lot about what I wanted out of my degree program. I wanted a strong focus on research, an excited and innovative cohort of students, and faculty support to take my work in new directions. Chicago offered up these qualities and more. I wanted a program that would help shape me into a professional in my field and, now in my fifth year, I can look back and see that my time at the University of Chicago has prepared me incredibly well for my next career steps. Beyond the academy, the University is located in a wonderful, lively city that allows each of us to find our own place. By coming to UChicago, you can choose to be a graduate student who happens to live in Chicago, a Chicagoan enrolled in graduate school, or a little of both! I've found my place at UC - both in my lab and out in the city - and I'm very thankful for my time here!

Courtney Stepien, Committee on Evolutionary Biology

Initially I applied to the University of Chicago for graduate school because of the diverse and stellar scientific research. I came to the University of Chicago because I connected with several professors during my interview and I enjoyed interacting with them on a personal level. Since I have been at the University, I have had a chance to explore Chicago and see for myself how amazing this city is. I love the opportunity to live in such a culturally diverse city that always has new and exciting possibilities. Here in graduate school, I have connected with several students and have a network of people who are supportive and helpful. As much as I have learned from my faculty and mentors, I have learned equally as much from my graduate peers. I think having a supportive and safe environment while constantly being challenged academically is the perfect combination for graduate school, and I encourage all graduate students to find that environment like I did. If I had to go back in time, I would not change a thing!

Colles Price, Cancer Biology



I chose to come to UChicago, because there were so many great options in faculty. I had no clue what I wanted to study, and only a nebulous idea of what type of research I would like to pursue. Thanks to the many wonderful talks and presentations arranged for us in the first year, I was able to get a sense of what I wanted to study, and got into rotations pretty quickly. My other major reason for coming to UChicago is closeness to my family and friends. Having grown up in the Chicago suburbs, I always thought some day after college I would live in the city, and now here I am. With the great food, great people, and great (advertised) activities and events, there is so much to see and do in the precious free time we have. I recommend getting to know your favorite take out and delivery places fast, because some nights it's just easier than cooking.

Jeff Steimle, Development, Regeneration and Stem Cell Biology



UNIVERSITY POLICIES



Career Advising, Resources and Workshops

Graduate Student Affairs has a dedicated **career adviser** for BSD graduate students and postdoctoral researchers. Graduate students may schedule one-on-one appointments to discuss various aspects of career development, including career exploration, application documents, interview practice, and connections with alumni and potential employers.

myCHOICE (Chicago Options in Career Empowerment) is a new BSD program dedicated to preparing students and postdocs for their future careers. The myCHOICE seminar series is designed to expose trainees to the full range of careers available to PhDs in biological sciences and to provide professional development opportunities. Following exposure, myCHOICE provides educational opportunities and ultimately experience. A central element of myCHOICE is interactions with mentors within and beyond the institution.

Graduate Student Affairs also offers additional programs and events for graduate students and postdocs that facilitate professional development and the exploration of a variety of industries and career paths.



UNIVERSITY POLICIES





myCHOICE

Chicago Options In Career Empowerment:

A program for doctoral and post-doctoral trainees

What is myCHOICE ?

The goal of myCHOICE is to educate and prepare University of Chicago trainees with biological science degrees for their ideal career path. The program has three levels with increasing involvement in career training and is supported by a diverse group of mentors.

Level 1: Exposure

A weekly, hour-long seminar series exposes trainees to diverse career options and professional development skills.

Level 2: Education

Offered on nights and weekends, 10-15 hour mini-courses provide more substantial information on particular career tracks.

Level 3: Experience

The most involved level of myCHOICE, experience includes internships with partner organizations or taking full courses through other University of Chicago schools.

Discover **your career** in:

Academic Research

Industry: Pharma/
Biotech

Technology
Commercialization

Entrepreneurship

Medicine & Healthcare

Business of Science

Law:
Policy/Regulatory

Science
Communication

Teaching

Research
Administration

Dean's Council

Dean's Council is a graduate student-oriented organization run by student representatives from each graduate program in the BSD. DC has two main purposes:

- To organize and fund social and academic events for BSD grad students
- To advocate for BSD grad students to the BSD administration.

Social events occur throughout the year and include such activities as movie nights, discounted tickets to sporting and cultural events around Chicago and pub nights on campus. DC also sponsors travel awards for students attending academic conferences.

In addition to deciding how funds should be distributed for events sponsored at the Dean's Council level, members are accorded discretionary funds that may be used for events on a programmatic level (for example, a Thanksgiving party for the Immunology program). Suggestions for events should come from both the Dean's Council member and the students he or she represents. Students should feel free to contact their DC representative if they have questions, concerns or suggestions. Ideas and feedback are always welcome!



Facilities and Resources

The buildings that house the departments and committees of the Biological Sciences Division are grouped toward the western edge of campus, which can be explored virtually at [UChicago maps](#). With researchers working in practically every area of biological investigation, UChicago hosts extensive facilities equipped with the most advanced resources.

Faculty members in the Molecular Biosciences generally have their laboratories in either the Cummings Life Sciences Building or the Gordon Center for Integrative Science (GCIS), while the Biomedical Sciences faculty are often found in the Knapp Center for Biomedical Discovery (KCBD). Neuroscience is concentrated in the Surgery Brain Research Institute (SBRI) and adjoining Abbott Hall, at the northeast end of the Hospital buildings. Hull Court, a leafy quadrangle adjoining the main University quad, houses the buildings of the Darwinian Sciences. The John Crerar Library, which stands next to Cummings in the science quadrangle, is the University's main science library and provides 24-hour access to graduate and medical students.



The Dorothy and Gaylord Donnelly Biological Sciences Learning Center (BSLC), which adjoins the Jules F. Knapp Medical Research Building on 57th Street, is an unparalleled modern teaching and research facility. All undergraduate, graduate and medical student biology classes are held in the Learning Center, which features interactive, computer-assisted teaching in the multimedia-ready classrooms and laboratories. The Knapp building also houses research labs in areas of immunology, human genetics, neurobiology, and molecular oncology.

The Gordon Center (GCIS) is designed to enhance collaboration among biological and physical scientists working in fields ranging from condensed-matter physics to synthetic chemistry and complex theory. It houses the Institute for Biophysical Dynamics, the Howard Hughes Medical Institute (HHMI), the James Franck Institute, and the Department of Chemistry. The building is the cornerstone of the science quadrangle.

HHMI is a scientific and philanthropic organization with laboratories located in academic medical centers, universities, and other research institutions throughout the United States, including the University of Chicago. HHMI faculty at the university are conducting research in the areas of cell biology and regulation, genetics, immunology, neuroscience, and structural biology.

Researchers in the Knapp Center (KCBD) translate the fundamental scientific discoveries made by the scientists in the GCIS into better care for patients, including those at Comer Children's Hospital. KCBD is home to the Kovler Diabetes Center, the Comprehensive Cancer Center, the Ludwig Center at the University of Chicago for Metastasis Research, the Institute for Genomics and Systems Biology, researchers from the Departments of Pediatrics and Medicine, and several divisional core facilities.

The **BSD's core computational, imaging, molecular, and cellular facilities** include state of the art **genomic capabilities** with next generation sequencing, constantly updated **integrated microscopy**, and the **transgenic mouse and embryonic stem cell facility**. The **Microwestern Array Core Facility** (MWAC) provides a versatile protein research platform for investigators, facilitating cancer biology, cardiology, and immunology research. The broad and interdisciplinary programs of the BSD provide additional core resources and enhance vital collegial interactions.



The Marine Biological Laboratory (MBL)



The **Marine Biological Laboratory** (MBL) in Woods Hole, Massachusetts is a premier international destination for research, education, and training in biology, biomedicine, and environmental science. MBL is now formally affiliated with UChicago through deep financial, organizational and faculty ties. The MBL-UChicago **affiliation** enhances both institutions' missions of leadership and innovation in scientific research and education.

The MBL has approximately 300 year-round employees, about half of whom are scientists and science support staff. The staff is joined each year by more than 300 visiting scientists, summer staff, and research associates from hundreds of institutions around the world, as well as a large number of faculty and students participating in MBL courses.

Among the scientists with a significant affiliation with the MBL, there are 55 Nobel Prize winners, 124 Howard Hughes Medical Institute affiliated scientists; 229 Members of the National Academy of Sciences; and 198 Members of the American Academy of Arts and Sciences.

The MBL currently has five year-round research centers focused on areas including ecosystems science and global climate change, microbial evolution, cell biology, neurobiology, and regenerative biology. Excitement regarding valuable innovation surrounds research in scientific imaging, computational biology, and the vast array of marine organisms available for study through MBL. UChicago graduate students are invited to apply for grants to conduct research at MBL.



Argonne National Laboratory and The Institute for Molecular Engineering (IME)

The University of Chicago manages **Argonne National Laboratory** in Lemont, Illinois, a huge multidisciplinary science and engineering research center, where “dream teams” of world-class researchers work alongside experts from industry, academia, and other government laboratories to address vital scientific questions. The University of Chicago has served as prime contractor of Argonne since the lab’s founding in 1946 as an outgrowth of the Manhattan Project and the University’s Metallurgical Laboratory. Surrounded by the highest concentration of top-tier research organizations in the world, Argonne leverages its Chicagoland location to lead discovery in a wide range of core scientific capabilities, from high-energy physics and materials science to structural biology and advanced computer science. **The Howard T. Ricketts Laboratory**, located on the Argonne Campus, provides state of the art Level 3 biocontainment facilities for conducting laboratory and animal research on biodefense-related and emerging infectious diseases. A free shuttle bus makes round trips every weekday between Argonne National Laboratory and the University of Chicago to promote collaboration.



In partnership with Argonne National Laboratory, the University of Chicago established the **Institute for Molecular Engineering** in 2011. Assembling a team of world-class researchers across a broad range of science and engineering disciplines, IME aims to translate discoveries in basic physics, chemistry, and biology into new tools to address important societal problems. By bringing together multiple disciplines, IME is well-equipped to develop breakthrough technologies. In cooperation with the BSD, for example, the IME is exploring the mechanisms that control the movement of biological fluids through tissue and the immune responses to tumor invasion—research that could lead to the development of synthetic vaccines against cancer and viral threats.

Graduate Programs

We offer a total of twenty PhD granting programs. The majority of graduate programs in the Biological Sciences Divisions (BSD) are organized in four broader umbrella groups called clusters: **Biomedical Sciences**, **Darwinian Sciences**, **Molecular Biosciences**, and **Neuroscience**. The programs within each cluster have overlapping course work and share additional training activities.

The following unclustered graduate programs offer unique experimental approaches and stand alone: **Biology at Janelia Farm**, **Biophysical Sciences** (PSD), the **Interdisciplinary Scientist Training Program MD/MSTP**, **Medical Physics**, and **Health Studies**. There are also other **dual MD/PhD training programs**, as well as a **Translational PhD/MS program**.

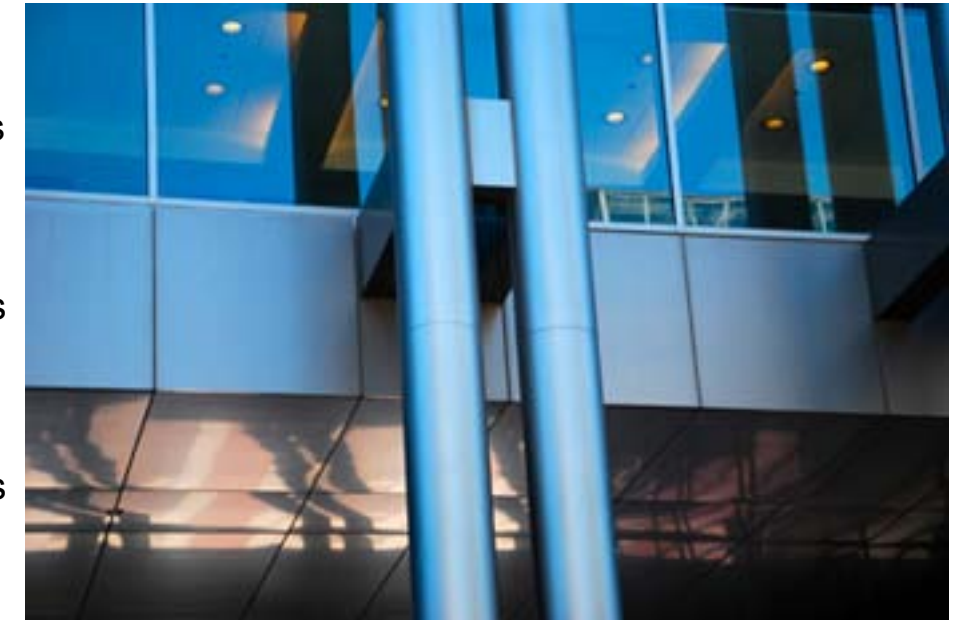


Biomedical Sciences Cluster

The **Biomedical Sciences Cluster** at the University of Chicago consists of five graduate programs: Cancer Biology, Immunology, Microbiology, Molecular Metabolism and Nutrition, and the Department of Pathology Molecular Pathogenesis and Molecular Medicine Graduate Program. The thematic curricular focus of the Biomedical Sciences Cluster is the basic scientific study of human biology and related disease processes. Each program in Biomedical Sciences is a distinct, degree-granting unit in the Biological Sciences Division. The Cluster system enables these programs to integrate faculty, coursework, research programs, training programs, and seminars/symposia for a truly multidisciplinary training experience. The result for graduate students is an integrated and flexible course of study, with options to work with over 170 full time faculty. For both pre and postdoctoral trainees and faculty, the interdisciplinary nature of the Biomedical Science Cluster provides extensive opportunities for interaction and collaboration.

Prospective students should apply directly to one of the five graduate programs within the Biomedical Sciences. It is in the best interest of applicants to apply to programs in rank order based on interest (highest to lowest). Applicants need not identify four individual programs, however the option is available if a student is undecided on his or her area of specialization. It is perfectly acceptable to apply to only one program.

Students are admitted to the Cluster into one of the five programs, but have the option of changing programs during the first year. Students combine study in core basic science areas with specialized study in programmatic core areas within their area of particular research interest. All students in the Biomedical Sciences Cluster must attend the All Stars seminar series which takes place during their first year throughout the Autumn and Winter quarters. This seminar series provides an opportunity for new students to learn about the research taking place in Cluster faculty laboratories. The goals of the Cluster curriculum are to ensure that students are adequately grounded in the basic sciences, exposed to the latest research and methodologies in their particular area of research interest, and allowed maximum flexibility in pursuit of their particular research interests.



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- [Cancer Biology](#)
- [Immunology](#)
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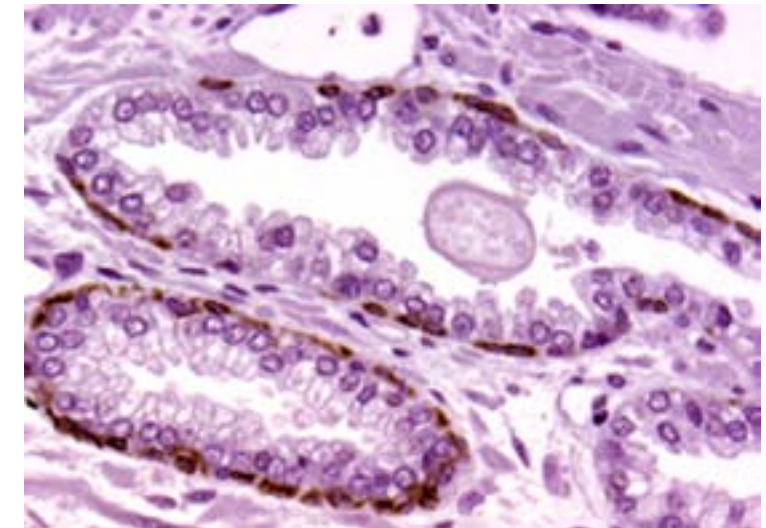


The Committee on Cancer Biology

The Committee on Cancer Biology provides multidisciplinary and integrated training in the basic biological sciences related to cancer research and prepares students to conduct research by offering a **core curriculum** that focuses on multiple aspects of cancer biology, including the genesis, progression, treatment, and prevention of cancer. The program provides doctoral students with the most up-to-date knowledge and research training in the molecular and cellular aspects of cancer biology. The goal is to prepare students for research careers in academia or industry, although many other outcomes and combinations are possible, including a career as a physician scientist or in areas such as patent law or science policy.

The CCB is committed to fostering interactions among graduate students, postdoctoral fellows, and faculty, and has been successful in all aspects of its commitment during the ten years since the graduate program began. It continues to attract, enroll, and train graduate students through its core curriculum and associated seminars, journal clubs, group research meetings, and symposia.

The broad range of interests and expertise of the faculty members of the CCB enables students to concentrate specifically in one of several areas of cancer biology, such as apoptosis, cancer cytogenetics, cell cycle, chromosome damage/repair, drug resistance, metastatic progression, signal transduction, or tumor biology. The approximately sixty-five faculty members of the CCB have primary appointments in almost every department within the BSD, including the Ben May Department for Cancer Research, Biochemistry and Molecular Biology, Health Studies, Human Genetics, Medicine, Molecular Genetics and Cell Biology, Neurobiology, Obstetrics and Gynecology, Organismal Biology and Anatomy, Pathology, Pediatrics, Pharmacology, Radiation Oncology, Radiology, and Surgery.



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Immunology

The Committee on Immunology provides multidisciplinary training in all aspects of Immunology. The Committee is dedicated to the open exchange of ideas among scholars of all fields, a commitment enhanced by an organizational structure that completely integrates the basic biological sciences with the clinical sciences. This multidisciplinary and integrated approach corresponds well with the reality of the new biology, where molecular and structural techniques are applied widely and with great success in the effort to develop new immunological approaches to the diagnosis and treatment of various immune diseases and cancer. The Immunology program has won training grant support from the NIH continuously for over thirty years.

Immunology students follow a **core curriculum** and take several advanced graduate level courses in specialized areas. As part of the Biomedical Sciences Cluster, Immunology students have the resources and flexibility to design particular courses of study to suit their ultimate research goals. They also have extensive opportunities for interaction with the other three clusters within the Biological Sciences Division.



Alexander Chervonsky, MD, Ph.D.
Chairman

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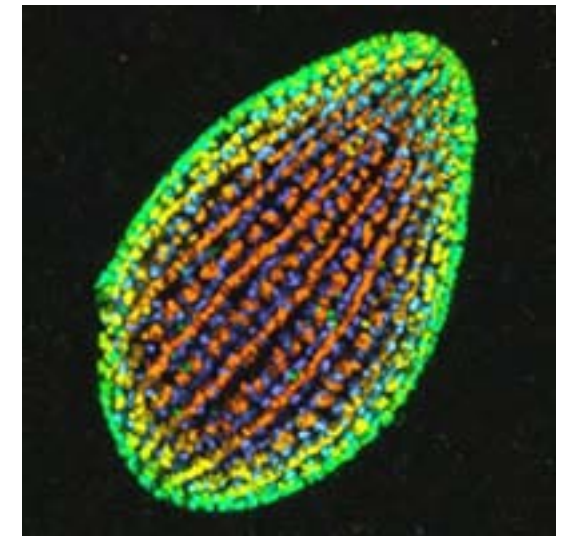
The Committee on Microbiology

Microbiology examines microbial life forms, their physiological properties and structures, as well as their ability to cause human, animal, or plant diseases. Microbiology is responsible for doubling human life expectancy in the past fifty years through achievements in anti-microbial therapy, vaccine development, and the enforcement of antiseptic and hygienic principles. It has also led to the prevention of plant disease, which has increased crop yields and food supplies for people around the world. Microbiology has also enhanced our understanding of the principles of heredity and molecular biology through the study of bacteria and bacteriophages.

Future research in microbiology will need to identify new anti-bacterial therapies by exploiting knowledge of genes that are required for pathogenesis, but not for replication outside the host. Microbiology researchers will work to identify anti-viral therapies and vaccination strategies that combat some of the most dangerous and abundant infectious diseases. Microbiology will also need to provide the research and therapeutic tools required to cure human inheritable diseases by supplying techniques for genetic exchange.

Modern microbiology is flourishing at the University of Chicago with students and post-graduate scientists from around the world who continue to push the frontiers of microbiological sciences through excellent educational programs and a challenging **curriculum**. The basis of graduate training in microbiology is the performance of original laboratory research. Required classes are designed to teach students the available experimental tools and to define the experimental frontier in a field. Upper-level graduate classes examine the most current scientific literature or the development of original research problems. Interdisciplinary study is encouraged.

The Committee on Microbiology is expanding with new faculty and research space. It is an energized, cutting-edge enterprise and a fun place to do science.



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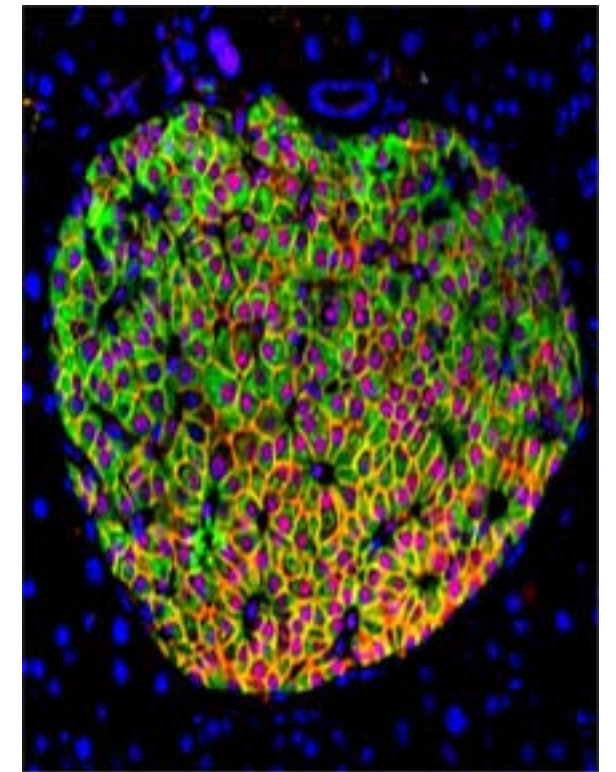
Molecular Metabolism and Nutrition

The Committee on Molecular Metabolism and Nutrition (CMMN) is a dynamic research unit offering interdisciplinary training in the molecular basis of biological processes as they relate to metabolic homeostasis, nutritional status, and human disease. Faculty members, who include both basic scientists and clinical researchers, have primary appointments in a variety of departments and join the Committee for the express purpose of interacting, training, teaching and mentoring graduate students.

Faculty research expertise covers the study of metabolism from various angles, relying on clinical research, as well as biochemical, physiological, cell and/or molecular biological approaches. A mixture of nationally recognized senior faculty and talented and active junior faculty provide a stimulating and supportive environment designed to guide graduate students through course work and research training.

Students train in the labs of faculty members associated with a variety of clinical sections and basic science departments. Through the CMMN **curriculum**, they acquire sound basic training in biochemistry accompanied by constant exposure to the impact of metabolism on human health and well being. Student thesis projects can comprise basic, clinical and/or translational research. The flexibility and diversity of options for graduate training coupled with the strong attention paid to the timely progression of each graduate student are the principal strengths of the Committee.

State of the art equipment, resources, and expertise are all readily available for a graduate student in CMMN. The Committee works closely with the federally sponsored Diabetes Adipocytes Research and Training Center, Digestive Disease Research Core Center, the Training Program in Digestive Diseases and Nutrition, and the Clinical Research Center, sponsored by a Clinical and Translational Science Award from the NIH, to offer a broad array of choices for research topics. There is also a very close affiliation of the CMMN with the newly established Kovler Diabetes Center (that has an NIH funded Diabetes Research and Training Center (DRTC) associated with it).



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Molecular Pathogenesis and Molecular Medicine

The Department of Pathology Molecular Pathogenesis and Molecular Medicine Program (MPMM) offers advanced study and research in experimental pathobiology, broadly defined but with particular emphasis in immunobiology, molecular oncology, vascular pathophysiology, and gut epithelial biology. The committee encourages scholarship and achievement and offers flexibility in its program to permit each student to pursue the most effective course of study and research.

The MPMM faculty come from basic science, translational, genetics, and clinical traditions. This enables the prompt transfer of fundamental discoveries to practical application in the understanding and treatment of such widespread and important diseases as atherosclerosis, asthma, diabetes, Crohn's disease, and autism. Furthermore, commonalities of scientific foundations and experimental approaches in the study of diverse questions in these organ systems leads to remarkable cross-fertilization and synergy among faculty and trainees.

The MPMM **curriculum** provides instruction in the areas of biochemistry, defense reactions, cancer biology, immunology, cellular and molecular pathology, and cell, molecular, and genetic biology that are generally completed within the first two years of study. Each student must select a faculty sponsor who is willing to supervise his or her thesis research. These faculty members may be chosen from the various departments in the Biological Sciences Division, provided the research program is deemed suitable by the departmental graduate student advisory committee.



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Darwinian Sciences Cluster

Three inter-connected academic units make up the **Darwinian Sciences Cluster**: the Department of Ecology and Evolution (E&E), the Committee on Evolutionary Biology (CEB), and the Integrative Biology Program in the Department of Organismal Biology and Anatomy (OBA).

These PhD programs combine to provide students with exceptional educational opportunities in ecological, evolutionary, and integrative biology. Students and faculty conduct research at a wide variety of museums and field sites worldwide. Students are encouraged to train broadly by interacting with faculty both within and outside the Darwinian Cluster, including close collaborations with colleagues at other local institutions, such as **Argonne National Laboratory**, **Brookfield Zoo**, **Chicago Botanic Garden**, **Field Museum**, **Lincoln Park Zoo**, **Morton Arboretum**, and **Shedd Aquarium**. In addition, CEB and E&E are members of the **Organization for Tropical Studies** and its field sites, research stations, and specialized courses in Costa Rica are available to students in the Darwinian Sciences. The Department of Ecology and Evolution has its own facility, the **Warren Woods Ecological Field Station**, on forty acres in southwest Michigan to facilitate long term research projects as well as curricular field work.

Graduate admissions is coordinated not only through admissions committees in each program within the Darwinian Sciences Graduate Cluster, but also with other related departments and committees on campus.



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Programmatic Core Links

- [Ecology and Evolution](#)
- [Evolutionary Biology](#)
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Ecology and Evolution

The Department of Ecology and Evolution (E&E) offers exceptional training for students pursuing a PhD. The world-renowned faculty, access to resources at multiple institutions, and an intellectually invigorating environment work together to foster the development of innovative and independent scientists. Researchers apply empirical to theoretical approaches across a wide variety of taxa: algae, microbes, plants and animals. Although our focus is on the importance of basic science, we also work to see the sound application of our research in the areas of genetically modified organisms, resource management, climate change, and the genetics of disease.

E&E students accomplish a lot: they perform research all around the world, publish in top-tier journals, are awarded prestigious fellowships and grants, and pursue rewarding and interesting careers in and out of academia. All students have in common a set of research questions that examine ecological and evolutionary processes that underlie patterns of life on earth.

Graduate student research is supplemented with a diverse offering of **courses** and seminars. In addition to two key journal clubs that have strong student participation, students administer their own Friday afternoon seminar series. Faculty and student interactions are facilitated through these journal clubs and seminars, as well as through our annual Retreat. All of these venues allow students to demonstrate intellectual development and independence. E&E currently holds two training grants from the Department of Education that support students in Evolutionary Genomics and Quantitative Ecology.

Students have access on campus to state-of-the-art laboratory facilities, such as DNA sequencing and functional genomics centers, the greenhouses, GRID computing resources, and microscopy cores. Students and faculty in E&E also interact broadly across campus with members of Statistics, the Geophysical Sciences, and other units within the Biological Sciences Division. Affiliations with Argonne National Lab and The Field Museum allow access to collections and facilities at these institutions. Field-oriented biologists take advantage of surrounding reserves and restoration areas, as well as numerous distant locales where faculty members have established research programs. The department has developed its own facility, **Warren Woods Ecological Field Station**, on forty acres in southwest Michigan to facilitate long term research projects as well as field work within the curriculum. The newly constructed field station is an extremely energy efficient "Passive House," making it the first Passive House-certified laboratory in North America and only the fifth worldwide.



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The Committee on Evolutionary Biology

The Committee on Evolutionary Biology (CEB) was established in 1968. Since then, CEB has provided a means for PhD students to pursue interdisciplinary research that does not readily fall within a single department's purview. CEB students have access to field sites, equipment, laboratories, research funds for pilot work, and an exceptional range of scientific and technical expertise. It has produced over 125 graduates who are now working around the world in universities, museums, zoos, and governmental and non-governmental agencies.

CEB presently includes more than sixty faculty members representing all four graduate divisions (Biological Sciences, Physical Sciences, Social Sciences, and Humanities), as well as institutions outside the University (Argonne National Laboratory, Brookfield Zoo, Chicago Botanic Garden, The Field Museum, Lincoln Park Zoo, and Morton Arboretum). This diverse faculty conducts research on most major groups of organisms, and in most ecosystems, using a broad and innovative range of methods and theoretical approaches. Faculty and students in the program are engaged in interdisciplinary studies at time scales that range from single generations to the entire history of life, and at organizational scales from molecular to global.

CEB students design individualized research programs in consultation with a dissertation supervisor and a committee drawn primarily from the CEB faculty. Faculty members of other institutions may be asked to serve on dissertation committees as needed. This diversity of input encourages students to strive for the highest level of interdisciplinary training relating to the research project.

Graduate admissions are coordinated with the Departments of Organismal Biology and Anatomy (OBA) and Ecology and Evolution (E&E), the other members of the Darwinian Sciences "Graduate Cluster," and with other departments and committees on campus. Students admitted into CEB usually draw more heavily on faculty from multiple departments or on faculty from more than one institution, but students in all programs are encouraged to train broadly by interacting with faculty both within and outside the cluster.



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Integrative Biology

The **Department of Organismal Biology and Anatomy** (OBA) is home to faculty and students with wide ranging interests in biological structure, function, development and evolution at the level of the organism. Integrative by nature, diverse in its methods, organismal biology is the most exciting and powerful lens through which to advance understanding and education about organismal development, behavior and evolution. Departmental faculty perform research on a wide variety of topics that generally fit under the categories of evolution and development, behavioral neurobiology, comparative biomechanics, and vertebrate paleontology.

OBA's graduate program in **Integrative Biology** trains students to pose strongly interdisciplinary research questions across fields in biology and among levels of biological organization. The educational curriculum enables students to build a strong foundation in integrative biology and students take a variety of core and elective courses in which they are introduced to faculty research and to different approaches to integrative research in organismal biology. A special feature of the graduate program is exploring common themes and points of interaction between areas of inquiry, so students are encouraged to develop a research focus and PhD project that encompass the full range of topics related to their principal interests. Students have the opportunity to utilize the diversity of expertise at the University and affiliated institutions, including the Field Museum of Natural History and Argonne National Laboratory.

There are numerous weekly seminar series that tackle diverse aspects of integrative biology. Core facilities across campus are available for use including a new confocal digital imaging facility in the Anatomy building. Students in the program are often supported by training grants from the NIH and NSF in the areas of developmental biology, genetics, and biomechanics.



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Molecular Biosciences Cluster

Graduate students in Molecular Biosciences receive integrated, cross-disciplinary training in the molecular aspects of biology. The programs embrace a wide range of interests and offer great flexibility in options for study and research while still ensuring rigorous training in areas central to each discipline.

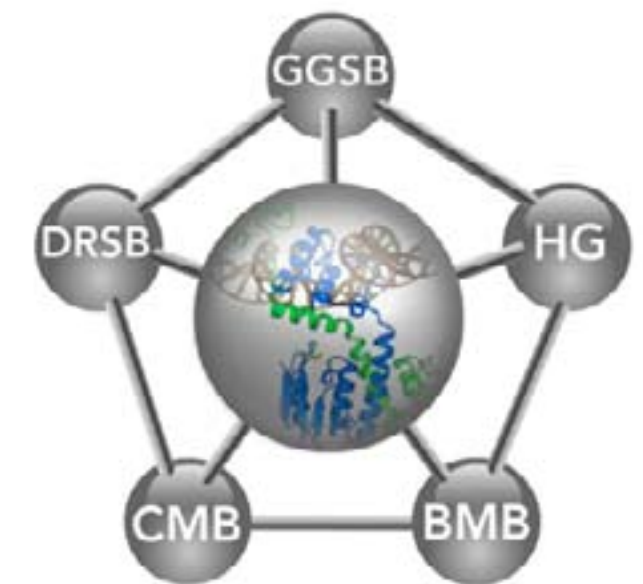
Students matriculate into one of five degree-granting programs. With program approval, they may change their affiliation during their first year. The five programs are:

- **Biochemistry and Molecular Biophysics**
- **Cell & Molecular Biology**
- **Development, Regeneration & Stem Cell Biology**
- **Genetics, Genomics & Systems Biology**
- **Human Genetics**

These programs share a **core curriculum** of courses in cell biology, genetics, and molecular biology on which students in all five programs base their study. The requirements for each program vary slightly. Each student designs an individual program of coursework in consultation with his or her academic advisor. Students may select courses during the first two quarters of residence that facilitate transition between programs.

More than 100 faculty research labs comprise an innovative and dynamic research environment in the Molecular Biosciences Cluster. The depth and breadth of the cluster's resources assure students' access to the wide range of instruments used in modern biological research. There are core facilities for DNA sequencing, peptide analysis, electron microscopy, computer analysis, and animal research. Shared research facilities are readily available for computer graphics, protein and nucleic acid chemistry, fluorescence-activated cell sorting, confocal microscopy, x-ray crystallography, and nuclear magnetic resonance. Adjoining research space houses internationally acclaimed labs in the areas of physics, chemistry, evolution and medicine, thereby providing the real possibility of transformative, interdisciplinary collaborations.

Cluster-wide seminars, colloquia, journal and data clubs, and an annual retreat provide numerous opportunities for hearing about the latest research, for students to present their own work, and for developing broad interactions and collaborations among students and faculty.



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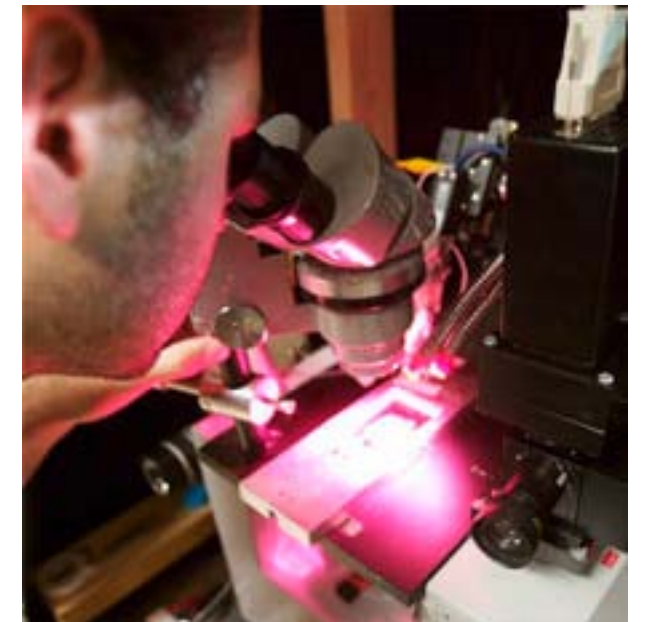


Biochemistry and Molecular Biophysics

The Department of Biochemistry and Molecular Biology studies how biomolecules operate and interact to drive the complex and diverse behaviors of living systems. Research encompasses all areas of modern biochemistry, including structural biology, biophysics, and biomolecular engineering and design.

The department is distinguished by its intellectual rigor and collaborative style. Interdisciplinary interactions are further facilitated by its presence in the **Gordon Center for Integrative Sciences**, which brings together a large and diverse group of biological and physical scientists to pursue common research goals. Members of the department ask broad and multifaceted questions, and as a result, trainees are well equipped for future academic and industrial careers in biochemistry and biophysics.

Along with coursework, students perform at least two lab rotations before identifying the lab in which they will pursue their doctoral research. These rotations familiarize students with what it is like to actually work in the labs they are interested in and to help them make an informed decision about which lab they would like to join.



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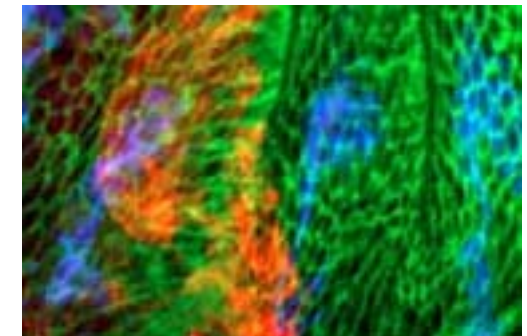
Cell & Molecular Biology

The goal of the doctoral program in Cell and Molecular Biology is to foster graduate students in advanced scholarship and research at the frontiers of cell biology, genetics, and molecular biology. Through **coursework** and **research**, students are introduced to a broad spectrum of experimental rationales and technical approaches, and typically learn several in depth.

The CMB program is administered by the Department of Molecular Genetics and Cell Biology and draws its internationally distinguished faculty from that department as well as from others. At a broad level, the faculty seek to reveal the fundamental molecular mechanisms underlying biological phenomena that function at the cellular scale. Faculty investigate problems across a wide spectrum of biology: areas of research include the cellular and molecular aspects of chromosome recombination and transmission; the molecular basis for the mechanism and regulation of gene expression; the biogenesis of cellular organelles; the assembly and organization of cellular structures; the coordination, regulation, and four dimensional orchestration of the cell division cycle; the molecular and cellular mechanisms of metazoan development; mechanisms of cell-cell interactions in development and disease; and how cells sense and respond to signals.

In their training, CMB students learn how to identify critical areas of research, how to frame experimental questions and how to choose the appropriate model organisms, tools, and techniques to answer their scientific questions in the most effective way. The model organisms in which students may acquire training include eukaryotic and prokaryotic viruses, diverse bacteria including cyanobacteria, Tetrahymena, the yeast *S. cerevisiae*, and *S. pombe*, Chlamydomonas, Drosophila, Caenorhabditis, Arabidopsis and other plant species, mice, and humans. Students will also achieve expertise in a range of skills, such as genetic analysis by transgenics, reverse genetics, and genomic analysis; molecular analysis of genes and gene products by biochemical and structural approaches; and cellular analysis by advanced microscopy, including atomic force microscopy, EM tomography, and dynamic imaging in vivo.

Students trained in the CMB program are highly competitive for top postdoctoral positions, and go on to influential careers in academic, biomedical, and industrial research as well as in teaching, law, business and government.



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The Committee on Development, Regeneration & Stem Cell Biology

The Committee on Development, Regeneration, and Stem Cell Biology (DRSB) takes an interdisciplinary approach to understanding the fundamental question of how a single cell, the fertilized egg, ultimately produces a complex fully patterned adult organism, and how the form of the organism is maintained during adult life through tissue renewal and repair.

More than thirty-five faculty from both basic science and clinical departments in the Division of Biological Sciences belong to DRSB. In their research, the faculty uses traditional model species including nematode worms, fruit-flies, Arabidopsis, zebrafish, amphibians, chick and mouse as well as nontraditional systems such as lampreys and cephalopods. Areas of research focus include stem cell biology, regeneration, developmental genetics, the cellular basis of development, developmental neurobiology, “evo-devo,” and the relationship between development and disease.

Students in DRSB share a common interest in understanding the remarkable processes that underlie development. The first year of study builds a foundation of **course work** in genetics, cell biology, and molecular biology, and provides courses covering all aspects of developmental biology. Course work is complemented by lab rotations designed to expose trainees to the breadth of approaches represented in the program, and to help them choose the right lab for their dissertation project.

Throughout their time in the program, DRSB students broaden their education by participating in retreats, seminars, and journal clubs, as well as regional and national scientific meetings and workshops. The Committee offers a high quality professional training experience with effective mentorship to ensure that DRSB graduate students fulfill their potential, and are well-prepared to make important contributions to developmental biology research and education.



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The Committee on Genetics, Genomics & Systems Biology

The Committee on Genetics, Genomics & Systems Biology (GGSB) is an interdisciplinary PhD granting program that brings together more than seventy biologists from over a dozen academic departments to train students to utilize sophisticated genetic analysis in their own research programs. Formerly known as the Committee on Genetics, the GGSB is a partner of the **Institute for Genomics and Systems Biology (IGSB)**.

GGSB students are trained in an intellectually stimulating, collegial, and supportive environment for careers as independent scientists in basic and applied biomedical research and education. The **curriculum** is tailored to meet the needs of students interested in receiving training in advanced rationales and methods of genetic analysis, as well as in learning to combine genetic-based strategies with other interdisciplinary approaches to investigate key clinical and basic science problems.

GGSB faculty members employ a wide range of genetic strategies to address important biological problems in diverse genetically tractable systems including, viruses, bacteria, blue-green algae, Arabidopsis, yeast, Tetrahymena, nematodes, Drosophila, mice, humans, and worms.

The presence of both basic and clinical sciences in the BSD enhances the Committee's broad interdisciplinary approach to teaching and research. The GGSB **program** combines a foundation in modern genetic analysis with training in current methods for formulating and addressing biological questions in the context of complex systems. Such systems are studied in physiological, developmental, and evolutionary contexts.



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Human Genetics

The Department of Human Genetics is the home within the BSD for the study of basic principles of genetics and genomics as applied to human disease. PhD candidates in Human Genetics are provided through the **curriculum** with **courses** and broad training in experimental genetics and genomics, statistical and population genetics, bioinformatics, and clinical genetics.

A common theme throughout the Committee's research is the application of basic genetic principles and strategies to the study of disease mechanism, disease susceptibility, and the genetic architecture of complex traits. Human Genetics faculty bridge the gap between basic and clinical research to train students for careers in academia, industry, and medicine.

Faculty members conduct research in a wide variety of areas of human genetics including:

- Complex Human Diseases and Phenotypes
- Population and Evolutionary Genetics
- Genomics of Gene Expression
- Animal Models of Human Diseases
- Systems Biology
- Epigenetics and Stem Cell Genetics
- Neurogenetics/Psychiatric Genetics
- Pharmacogenetics

Faculty and students conduct a broad range of basic and translational research in both wet and computational dry labs. Many PhD students combine wet and dry lab work in their thesis research. All students are encouraged to take advantage of interactive and collaborative relationships at the departmental, divisional, and university-wide levels.

Before joining a lab and developing their own research proposal, students attend bi-weekly seminars where divisional faculty present their research programs. Students also undertake two or three laboratory rotations to become acquainted with the full spectrum of research and trainers available to them.



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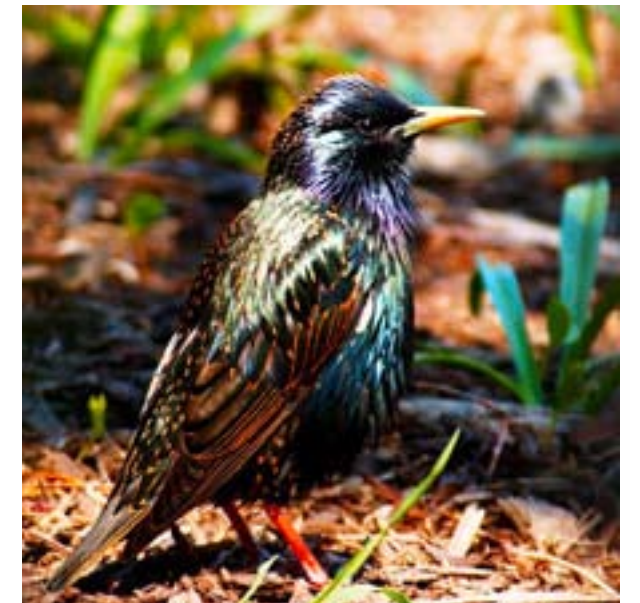
Neuroscience

Neuroscience is one of the most exciting and fastest growing research fields. Examining the development and function of nervous systems not only holds the key to better understanding the interaction of animals and human beings with their environments, but will also allow the development of therapeutic strategies for the treatment of neurological, behavioral, and psychiatric disorders. At the University of Chicago, there are three closely interacting, interdepartmental graduate programs in **Neuroscience** that study nervous systems, brain function, and behavior: Computational Neuroscience, Neurobiology, and Integrative Neuroscience. Combined, these three programs form the Neuroscience Cluster, which comprises over 80 faculty members from both basic research and clinical departments.

Computational Neuroscience focuses on mathematical modeling of neural systems and emphasizes physical science-motivated approaches to understanding the brain.

The **Neurobiology** program studies the nervous system, including the genetic and molecular basis of the development of the nervous system, the activity of channels and transporters, synaptic transmission and neuronal signaling, properties of sensory systems, neuronal activity which generates behavior, and the theoretical basis of information processing.

Integrative Neuroscience, a track of study in the Department of Psychology (Social Sciences Division), focuses on neural systems that mediate complex behaviors.



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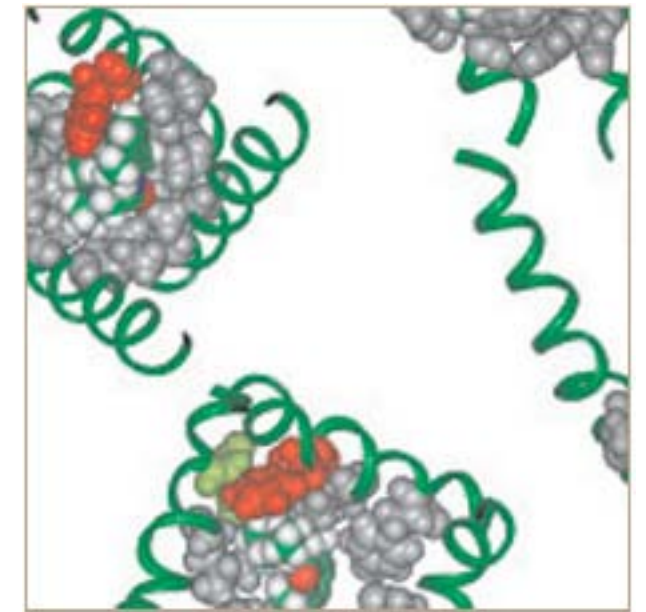


Computational Neuroscience

The University of Chicago has a long tradition of innovative research in the neurosciences. K. C. Cole developed the voltage clamp here, Stephen Polyak and C. J. Herrick did pioneering work on the anatomy of the retina and brain, and Jack Cowan and Hugh Wilson were among the first to develop mathematical analyses of the dynamics of cortical neurons using non-linear dynamics. This tradition is continued in the Committee on Computational Neuroscience, which provides an interdepartmental and interdivisional focus for multidisciplinary training in neuroscience. Computational neuroscience is a relatively new area of inquiry that is concerned with how components of animal and human nervous systems interact to produce behaviors. It relies on quantitative and modeling methods to understand the function of the nervous system, natural behaviors and cognitive processes, and to design human-made devices that duplicate behaviors.

Students in Computational Neuroscience take the nine required courses in the Computational Neuroscience curriculum, complete two laboratory rotations, and enroll for at least nine quarters of research. The required courses are typically taken in the first two years and arranged into three themes. The neuroscience theme presents the basic concepts and phenomena in neuroscience. The mathematics theme presents the quantitative techniques required for a modern analysis of the nervous system and behavior. The computational neuroscience theme illustrates how quantitative methodologies are used to understand neurons and behavior.

The **curriculum** and **course work** in computational neuroscience prepare students for research in neurobiology, psychology, or in the mathematical or engineering sciences. Graduates from this program move to traditional academic careers, careers in biomedical research or engineering, or opportunities in the corporate world.



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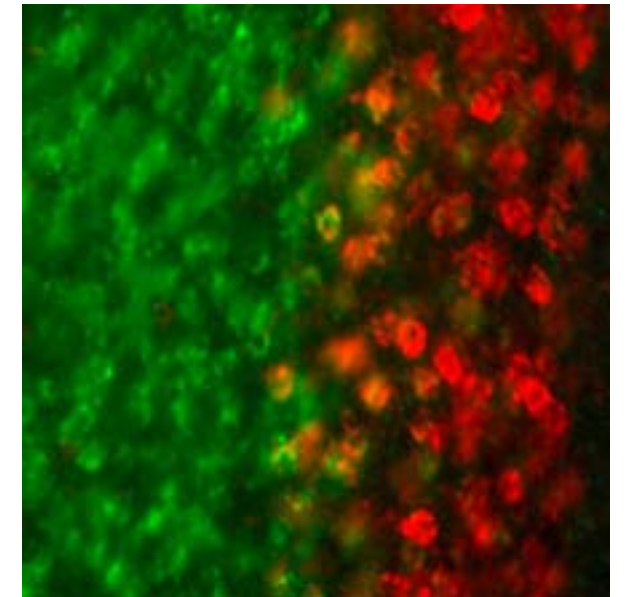
Neurobiology

There has never been a more exciting time to study neurobiology. Novel molecular, cellular, systems-level, and computational techniques are used to explore the functions of the brain to an extent that was unforeseen only a short time ago.

The Graduate Program in Neurobiology, with more than sixty faculty members using state-of-the-art techniques is a large, interdisciplinary program where all students receive concentrated attention from faculty who serve as mentors, advisory committee members, and course instructors. Research strengths include molecular neurobiology, cellular neurophysiology, developmental neurobiology, systems neuroscience and computational neurobiology.

Each student takes a core **curriculum** of four **courses**, and three electives. The student's faculty advisory committee is responsible for ensuring that students have taken courses appropriate for their research interests and may suggest additional course work in other fields such as cell physiology, molecular genetics, or mathematics.

During the first year, students rotate through different laboratories while they take course work. No set number of rotations is required, but students are expected to be associated with a laboratory at all times. At the end of the first year, an advisory committee which will supervise the progress of the student is formed. In subsequent years, as a student's interests change, the composition of the advisory committee may be modified.



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Biology at Janelia Farm

The **Howard Hughes Medical Institute Janelia Farm Research Campus** in Ashburn, Virginia is a leading biomedical research center where outstanding scientists from diverse disciplines use emerging and innovative technologies to pursue biology's most challenging problems. Committed and gifted graduate students are invited to apply to a fully-funded, collaborative PhD program with the University of Chicago.

The **unique PhD program** pairs exceptionally motivated students with mentors who encourage a certain amount of independence. Each class of PhD candidates is small, as are Janelia's laboratories. Students, therefore, quickly become fully integrated in the lab and have exceptional opportunities for day-to-day contact with their lab heads and other colleagues. Graduate students at Janelia have been co-authors on manuscripts published in leading journals.

Janelia Farm research goals include the identification of general principles guiding how information is processed by neuronal circuits, the development of new imaging technologies, and computational methods for image data analysis. Researchers work together in "self-assembling" multidisciplinary teams to solve challenging biological problems that are difficult to address in existing research settings.

Students have two supervisors, one at Janelia Farm, and one at the University. During their first year, students will reside at Chicago to take required courses and complete lab rotations. In their second year through to their defense, students reside at Janelia, conducting their thesis research. Degrees will be granted by the University of Chicago.



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Biophysical Sciences

The University of Chicago offers a fundamentally interdisciplinary PhD program in Biophysical Sciences, designed for students with expertise in the physical sciences (Chemistry, Physics, Mathematics, Computer Science, and Engineering), who are drawn to investigate complex questions in biological systems.

The program curriculum, taught by faculty from across our scientific community, furthers scholarship in the physical sciences while developing the knowledge base required to conduct research in biology.

One of the unique advantages of the program in Biophysical Sciences is the year-long laboratory course, “Synthesis and Modification.” In this intense 20 hour a week course, students explore a series of important current instruments and techniques while carrying out the systematic characterization of several genes and their expressed proteins. The genes are chosen by the students from the long list of “uncharacterized ORFs” (open reading frames) that have been predicted by genome sequencing projects, but have never been examined further.

Thesis research is conducted under the supervision of two mentors who bring different intellectual and physical tools to bear on a student-designed joint project. Program mentors are drawn from at least a dozen physical, biological, and clinical departments. The depth and breadth of the faculty’s experience and interests provide extraordinary flexibility to thesis research possibilities.

The Biophysical Sciences Program combines the fields of Synthetic Biology & Bioengineering, Computational/Theoretical Biophysics, Systems Biology & Cell Regulation, Chemical Biology, Molecular & Cellular Dynamics and Structural Biology, on top of a strong foundation of Chemistry, Physics, Biochemistry, and Cell Biology. Students in the program study the dynamics and structure of life from quantum and statistical mechanics, through the resolution of light, and up to the form and function of the cell as the basic biological unit.



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Interdisciplinary Scientist Training Program - MD/MSTP

The goal of the Interdisciplinary Scientist Training Program is to train the next generation of physician-scientist leaders. Our program is designed to provide all ISTP students with rigorous scientific training that prepares them to excel in their fields of interest, while providing the flexibility to forge new connections between traditional scientific areas.

Five weeks prior to the Pritzker start date, incoming ISTP students begin an MSTP-only anatomy course, and finish the course with their medical school colleagues in August. During the Autumn, Winter, and Spring Quarters, ISTP students take graduate school courses in addition to their medical school courses. Typically, a total of three to five graduate school courses will be finished by the end of the first year. Members of the ISTP Curriculum Committee will meet individually with each student every quarter before registration for the coming quarter. During these meetings, the committee will work with the students to determine which courses will best ensure that they are adequately prepared to embark on their graduate work when they join a lab.

Participants are also required to develop thesis projects focused on human biology or disease processes, and remain intellectually engaged with translational research topics through various conferences, seminars, and workshops.

All first year ISTP students participate in the Topics Journal Club course. This course provides an in-depth primary-literature based examination of basic science courses taken as part of the Pritzker Initiative Curriculum. It allows students not only to develop an appreciation for the primary literature and learn to critically evaluate articles, but also to learn more about experimental design and how to evaluate and present an overview of a field, as well as to become proficient in overall presentation skills.

ISTP encourages students to choose an area of “specialization.” **Specializations** require that students participate in programmatic activities such as Research-in-Progress, Journal Club, Retreats (if available), seminar series, etc. All students must present their research yearly in a program-approved venues. Students who choose not to do a prescribed Specialization may design their own programs with the approval of the ISTP Curriculum Committee.

At the University of Chicago, ISTP students have the flexibility to choose to break from medical school to pursue their graduate research after either the first year of medical school or the Spring Quarter of their second year of medical school. Most students take three to four years to complete their PhD research and successfully defend their dissertations prior to returning to medical school.

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Medical Physics

Medical physics applies the principles of the physical sciences to biomedical problems. The activities of medical physicists cover a broad spectrum that ranges from the study of basic biomedical processes to the diagnosis and treatment of disease, and thus, the training **curriculum** of a medical physicist must be broad. To participate fruitfully in this interdisciplinary profession, a medical physicist must be thoroughly competent in the physical and mathematical sciences related to imaging physics and radiation physics, must understand biological principles, and must be able to communicate with physicians.

The Committee on Medical Physics offers a program to provide aspiring medical physicists with the knowledge that they will need in their future profession. Our program leads mainly to the Doctor of Philosophy degree with emphasis on research that provides preparation for careers in academia, industry, and/or in clinical support roles.

The Medical Physics program is recognized internationally for its research excellence. Many of the investigators are leaders in their respective specialties. Also, because the program is located in the **Medical Center of the University**, there are strong interactions between the clinical and research staff. Faculty with a primary interest in diagnostic imaging hold appointments in the Department of Radiology, whereas faculty with a primary interest in the physics of radiation therapy hold appointments in the Department of Radiation and Cellular Oncology.



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Health Studies

The PhD program in the Department of Health Studies offers advanced courses of study in biostatistics, epidemiology, and health services research, supported by a core methodological curriculum in population-based research on human health. Students completing the program are prepared to design and conduct methodological and substantive research on fundamental questions about human health and biomedical science from a population perspective. They are also prepared to collaborate with colleagues from different disciplines to carry out such research.

The program is organized around a common quantitative core curriculum designed to prepare students methodologically for more in-depth study in their chosen field and for dissertation research. Beyond the core curriculum, each student chooses a major disciplinary area of concentration, takes a sequence of advanced courses in that area, and prepares a dissertation of independent, original, and rigorous research in that area. Opportunities for such concentrated study are available in the three broad areas represented by the Health Studies faculty: biostatistics, epidemiology and health services research.

In addition to the concentration, each student chooses a minor program of study in another area either represented by Department faculty or offered elsewhere at the University. The combination of the major concentration and minor program is intended to provide a curriculum with both disciplinary depth and an interdisciplinary perspective on problems in population health and biomedical science.

The Health Studies PhD program is also designed to accommodate students seeking a joint MD/PhD degree at the University of Chicago. Program requirements are modified so as to dovetail with coursework and clinical activities taken as part of the MD program. Specifically, core course requirements remain the same as those for non-MD students. However, major concentration course requirements are reduced, as there is expected synergy with medical school courses. Additionally, the minor program is waived, essentially being replaced by the student's preparation in clinical medicine. For the typical student, three to four years of residency in the PhD portion of the MD/PhD program are expected in addition to the four years of medical school.



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Dual Degree MD-PhD Programs

The University of Chicago has a long standing tradition of encouraging students to combine independent research and the study of medicine by obtaining the MD and PhD degrees concurrently. Graduates of combined programs are found in a variety of settings including teaching and research hospitals, universities, research institutions, biotechnology or pharmaceutical companies and more.

MSTP & GDTP

The Pritzker School of Medicine is home to two highly competitive NIH funded joint doctoral programs, the **Medical Scientist Training Program (MSTP)** and the **Growth and Development Training Program (GDTP)**. MSTP is designed for students who seek broad careers in biomedical related research and wish to apply both clinical and research expertise to solve the most pressing problems in medical science. The GDTP is available to current medical students who decide to obtain a doctoral degree after matriculating to the Pritzker School of Medicine.

MD/PhD - Division of Biological Sciences

Medical students may also apply to the nineteen PhD programs in the division to obtain a PhD independent of the above dual degree programs. Admission will be based on the graduate program application including letters of recommendation, GRE scores, and a personal statement describing an interest in scientific research. All applicants admitted to a PhD program are offered a full fellowship that includes tuition, fees, and a competitive stipend.



Admissions Links

- [Application Information](#)
- [Financial Support](#)
- [Frequently Asked Questions](#)

Programmatic Core Links

- [MD-PhD Programs](#)
- [Translational Training Programs](#)



Translational Training Program

The new **Howard Hughes Medical Institute** (HHMI) - University of Chicago PhD/MS Translational Training Program (TTP) is designed to engage students in both basic biological and clinical research, and to bridge the gap between highly specialized research and human disease processes in the context of a formal PhD program. Graduates will receive a PhD in their chosen discipline and an MS in Translational Sciences.

In addition to gaining a strong understanding in modern research methodology, trainees will simultaneously be trained in team science and exposed to clinical problems that present them with opportunities to establish their credentials as biomedical researchers.

While following an **HHMI-MIG Curriculum**, participants are also required to develop thesis projects focused on human biology or disease processes, and remain intellectually engaged with translational research topics through various conferences and seminars.

Each trainee will have two mentors; one from his or her primary department and one with a clinical background.

The Translational Training Program courses, lectures, and workshops offer exposure to a wide array of clinical situations that would not be experienced in a regular basic science program; the requirement of having a thesis supervisor with a clinical background assures a medical focus in the research project.

Program participants receive a supplement to the current stipend levels, as well as funds toward laboratory expenses (core facilities charges, statistical analysis, etc.), consumables and conference attendance.

First-year doctoral students in the **Biomedical Sciences** and **Neuroscience** are eligible to apply.



Admissions Links

- [Application Process](#)
- [Financial Support](#)

Programmatic Core Links

- [MD-PhD Programs](#)
- [Translational Training Programs](#)



Application Procedures

We require all applicants to apply online through the website of the Office of Graduate and Postdoctoral Affairs, Biological Sciences Division, at <http://gradprogram.bsd.uchicago.edu>

Useful links:

- [Requirements for Admission](#)
- [Application Process](#)
- [Financial Information](#)
- [Application FAQs](#)
- [Admission Schedule](#)
- [Test of English Proficiency](#)

To contact graduate admissions
Email: bsd.ogpa@lists.uchicago.edu
or telephone: [773] 834-2105

The mailing address is
Office of Graduate Graduate and Postdoctoral Affairs
Biological Sciences Division
The University of Chicago
924 East 57th Street, Suite 104-C
Chicago, IL 60637-5416



Degree Requirements

Students within individual degree programs are expected to satisfy the curriculum, preliminary examination, qualifying examination, and dissertation requirements of their particular program. These requirements are available from the individual programs.

Residence

For degree track students, the University has established a residency system where registration and tuition are determined not by the individual course load, but rather by the students' residency classification. Most graduate students within a doctoral track register under the following residence progression:

First Four Years of Graduate Study: Scholastic Residence

From Fifth Year Onwards: Advanced Residence

Students who have reached the advanced residence portion of their degree progress may also request a shift to Pro Forma status, if their research requires that they be out of residence at the University. University academic policies and requirements are detailed in the **student manual**.

Teaching Requirement

It is a Divisional requirement for all PhD students to teach twice for credit in pre-approved teaching assistant positions in the Biological Sciences. The requirement must be fulfilled before the PhD degree can be awarded. Those students who are apprehensive about their first experience of teaching may take a training course, which is currently offered each year during the Fall Quarter. Other helpful materials can be found listed under **Teaching Opportunities**.

Course in Scientific Ethics

All students are required to take a course in Scientific Integrity and the Ethical Conduct of Research in the Spring Quarter of their first year of study. A second training course in Ethics and the Responsible Conduct of Research is required after year four. This training is arranged by the graduate program and focused on specific examples relevant to the program's area of research.



University Policies

Non-Discrimination

In keeping with its long-standing traditions and policies, the University of Chicago, in admissions, employment, and access to programs, considers students on the basis of individual merit without regard to race, color, religion, sex, sexual orientation, national or ethnic origin, age, disability, or other factors irrelevant to participation in the programs of the University. The **Affirmative Action Officer** is the University's official responsible for coordinating its adherence to this policy and the related Federal and State Laws and regulations (including Section 504 of the Rehabilitation Act of 1973, as amended).

Sexual Harassment

The University of Chicago is committed to maintaining an academic environment in which its members can freely work together, both in and out of the classroom, to further education and research. The University cannot thrive unless each member is accepted as an autonomous individual and is treated civilly, without regard to his or her sex or any other factor irrelevant to participation in the life of the University. Every member of the University community must recognize that sexual harassment compromises the integrity of the University, its tradition of intellectual freedom, and the trust placed in its members. It is the intention of the University to take all necessary actions to prevent, correct, and, where indicated, discipline sexual harassment.

Sexual advances, requests for sexual favors, or sexually directed remarks constitute harassment when either:

1. submission to such conduct is used or threatened to be used as the basis for academic or employment decisions; or
2. such conduct directed against an individual persists despite its rejection.

Sexual harassment by any member of the University community is prohibited. This prohibition includes peer harassment among students, staff or faculty. Sexual harassment by a faculty member, instructor or teaching assistant of a student over whom he or she has authority, or by supervisors of a staff member, is particularly serious. Such conduct may easily create an intimidating, hostile, or offensive environment and will not be tolerated.

Campus Security

The University annually issues and distributes a publication on security called Common Sense. This publication contains information about the University security policies and resources, procedures and facilities for reporting crimes and emergencies, suggestions to assist individuals in preventing crimes, and statistics about crimes on campus the preceding three years. The University also annually distributes its Drug and Alcohol policy to all students and employees. If you would like to obtain a copy of either of these publications, please contact the **Office of Graduate and Postdoctoral Affairs**.

