BCM Baylor College of Medicine
HOUSTON, TEXAS
The Graduate School of Biomedical Sciences

discover
Virtually every method, model system, and research instrument can be found in the Texas Medical Center, and our graduate students can tap into this vast array of resources when working on their research.

...Your Access to Experts
We offer 14 programs that lead to a Ph.D., as well as an outstanding M.D./Ph.D. program. Find out more about each to determine which areas of research best match your investigative interests.

...The Launch Pad for Your Career
The Graduate School of Biomedical Sciences at BCM is a great place for those who want to be challenged intellectually and work collaboratively.

...A Great Place To Live
Houston has big-city benefits and a small-town feel, as well as a young, diverse population that has access to all kinds of perks.

...The Extras That Lead to Success
We offer a number of resources and support services that help students meet their research goals quickly and reach their maximum potential.

...The Advantages of BCM
There are unique benefits associated with earning your Ph.D. from a medical institution, and since BCM is among the best in the country, the advantages of training here are even greater.

...The Career Possibilities
One of the great things about earning a Ph.D. is that your skills can be applied in a variety of careers.

...Your Specific Path
14

We offer a number of resources and support services that help students meet their research goals quickly and reach their maximum potential.

12 Course of Study at BCM
17 Additional Educational Opportunities
19 Programs for Developing Scientists
20 Cost & Admission Information
23 Where Our Alumni Go from Here
There has never been a more exciting time for a career as a Ph.D., and some of the best scientific training available today is found at medical institutions like The Graduate School of Biomedical Sciences at Baylor College of Medicine (BCM) in Houston, which is among the top American graduate schools according to U.S. News & World Report.

One great thing about applying to a Ph.D. program is that you get to choose the area of study that really interests you. We have 14 graduate programs with outstanding faculty members who are conducting basic and clinical research that has the potential to improve human health. I am proud of the excellent faculty at BCM, among whom are members of the prestigious National Academy of Sciences, the National Academy of Sciences Institute of Medicine, and the Howard Hughes Medical Institute. Another indication of research quality is the level of funding received. Our faculty receive more than $400 million in total research support.

In addition to the cutting-edge science conducted here, there are many aspects of the school that blend to create an exciting research environment and good quality of life.

Our faculty are committed to mentoring the next generation of scientists. Our graduate students are among the brightest in the world, which is reflected by the fact that they are authors on about 40 percent of the papers published by our Graduate School faculty. And, our curriculum responds to the ever-changing advances in modern biomedical research.

BCM is located in the heart of the Texas Medical Center (TMC), where virtually every method, model system, and research instrument is available to students. The Texas Medical Center is located in one of the best parts of Houston, a multicultural city that offers a unique blend of big-city benefits and small-town community. Houston’s low cost-of-living means the competitive stipend we pay to all of our students during their entire graduate career is enough to cover their expenses.

I encourage you to learn more about our Graduate School by reading this brochure and consulting our website at www.bcm.edu/gradschool.

If you have questions, please call us at either 713-798-3312 or toll free at 888-550-9288, or email us at gradappboss@bcm.edu.
When you tell people you’re considering Baylor College of Medicine for graduate school, you may get some puzzled looks...did you decide to become a doctor instead of a scientist? This confusion is understandable, because many people only associate graduate schools with undergraduate colleges and universities. But, you’re smarter than the average person, and you know that some of the most exciting scientific training available today is found at places like The Graduate School of Biomedical Sciences (GSBS) at Baylor College of Medicine (BCM) in Houston.

Earning your Ph.D. from a medical institution also offers unique benefits, and, since BCM is among the best in the country, the advantages of training here are even greater.

UNLOCKING THE MYSTERIES OF HEALTH
The type of research being conducted at medical institutions is one important difference. Our world class faculty members are exploring questions that have the potential to impact human health. Graduate students can choose from 331 faculty members pursuing a wide range of exciting research projects in areas such as:

- Aging
- Cancer, cell cycle, and growth control
- Developmental biology
- Gene expression and regulation
- Gene therapy
- Genetics of inherited diseases
- Genomics and proteomics
- Immunology/Autoimmunity
- Microbiology and virology
- Protein structure and function
- Signal transduction
- Structural and computational biology

Just think, as a BCM graduate student, you could help unlock a mystery that leads to better treatments—or even cures—for future generations.

LEARNING FROM THE BEST
Obviously, the best learning experiences come from working with leading scientists, and you won’t find much better than the faculty at BCM. One important indicator of research quality is the amount of funding an institution receives. The primary source of federal funding for health-related research is the National Institutes of Health (NIH). In 2004, BCM faculty received close to $250 million from the NIH—only 10 institutions in the nation received more. When you include all sources of funding, BCM’s annual total research support tops $400 million.

TO TEACH OR NOT TO TEACH
Another difference for those attending BCM’s Graduate School of Biomedical Sciences is that student teaching is an option, not a requirement. This means students get the best of both worlds. Those who are interested in teaching can serve as teaching assistants for graduate student courses, but those who do not wish to teach can jump quickly into doing research instead.
RESEARCH-INTENSIVE ENVIRONMENT

Some institutions just tout the importance of research, but it’s an integral part of BCM. Need proof? The College has dedicated more than 800,000 square feet of its space for laboratory research. In keeping with its proven track record for growing its research infrastructure, BCM is starting construction in 2005 of a new eight-story building that offers an additional 122,000 square feet of research space. In addition, the College plans to begin constructing in the next few years a shared building with nearby Rice University that will provide another 200,000 square feet of research space for BCM faculty. According to the National Science Foundation (NSF), BCM spends more on research and development in the life sciences than any other research institution.

Housed within all this research space are exceptional centers and facilities, such as Baylor’s Human Genome Sequencing Center—one of only three sites that collaborated to complete the human genome sequence and a continuing leader in technology development and sequencing the genomes of other organisms, the Breast Center, the Cancer Center, the Center for Cell and Gene Therapy, the Huffington Center on Aging, the National Center for Macromolecular Imaging, the W.M. Keck Center for Computational Biology, and state-of-the-art microscopy, DNA sequencing, microarray, and protein sequencing facilities. BCM also has one the largest mouse facilities in the country and more mouse models for human disease than almost any place else.

FORWARD-THINKING INSTITUTION

The most dynamic health research environments of the future will be those that focus on translational research—moving discoveries from the lab to the patient. The interconnectedness of BCM’s graduate school faculty and physicians makes translational research a natural occurrence in labs and clinics throughout Baylor. However, this collaborative spirit extends well beyond the College to include joint projects with experts at other institutions, including many of the top-ranked hospitals in the Texas Medical Center and educational institutions like Rice University.

This synergy of collaboration produces an excitement that vibrates through new open concept laboratories that further promote interaction across disciplines. The innovative design of BCM’s new research facilities will foster even more opportunities for collaboration.

For details on individual faculty and their research programs, visit:

www.bcm.edu/gradschool/phd-programs.html
Getting a Ph.D. is a serious endeavor—one that will likely take five to six years of your life. So choosing the right grad school ranks right up there in the list of major decisions. Sure, you’re looking for a place that offers a great education, but—let’s face it—you’re going to be spending a lot of time there, so you also need an environment that fits your style of learning.

The Graduate School at Baylor College of Medicine is among the top 10 percent of American graduate schools according to U.S. News & World Report. But, we’re certain you’ll want to do a little more research before deciding if it is the right place to launch your career.

The formula for a great scientific education is pretty elementary: Exposure to faculty who are innovative thinkers, plus faculty who are committed to training the next generation of researchers, equals outstanding training.

INNOVATIVE THINKERS

Baylor College of Medicine is a magnet for faculty who are leaders in their fields, as well as rising stars.

- There are 331 GSBS faculty members who actively participate in 14 graduate programs that lead to a Ph.D.
- Among our faculty are members of the prestigious National Academy of Sciences, the National Academy of Sciences Institute of Medicine, and the Howard Hughes Medical Institute.
- Today, our faculty receive more than $400 million in total research support.
- BCM is ranked 11th among all U.S. medical schools for National Institutes of Health funding.
- Faculty frequently publish in high quality journals and are invited speakers at national and international meetings.
- Many of our faculty hold leadership positions in professional organizations, are members of grant review panels at the NIH and the NSF, and serve as editors for journals.
STUDENT DEMOGRAPHICS:
There are approximately 500 students. About 62% are U.S. residents and 38% are foreign nationals; 53% are men and 47% are women; and about 69% are White, 15% are Asian, 11% are Hispanic, and 6% are Black.

All of our graduate students RECEIVE A COMPETITIVE STIPEND for their entire course of study. When adjusted for cost-of-living, our stipend is equal to or better than most of the other leading graduate schools.

By the time students graduate, the vast MAJORITY ARE AUTHORS on multiple, original research publications in excellent journals. About 40% of the publications of our faculty have graduate students as authors, many as the first author.

COMMITMENT TO EDUCATION
BCM recognizes that training tomorrow's scientific leaders requires new approaches that respond to the rapid changes in biomedical research.

••• A curriculum committee, which includes student representation, evaluates and updates the curriculum on a regular basis
••• In the last 20 years, the number of Ph.D. programs has increased five-fold
••• The number of graduate students at GSBS has doubled in the last 20 years; there are currently 496 graduate students
••• The Graduate School core courses are taught by faculty who volunteer for those assignments because of their enthusiasm for and commitment to teaching
••• BCM sponsors a wide range of courses for faculty to improve teaching skills
••• Prestigious honors are given annually to recognize BCM’s best educators and researchers

Dig a little deeper into what's going on at BCM and you will quickly realize that there is no problem getting a great education here. But, will you have fun doing it? Make no mistake: the work is challenging and the expectations are high, but, unlike some schools, here you're not in it alone. There is a spirit of cooperation and support that translates into success.

BEYOND THE SCIENCE
The Graduate School of Biomedical Sciences at BCM is a great place for those who want to be challenged intellectually and work collaboratively. In addition to the cutting-edge science conducted here, there are many aspects of the school that blend to create an exciting environment and good quality of life for students.

••• Collaboration is a hallmark at BCM
••• Throughout the College there is a sense of excitement and an energized atmosphere
••• Diversity is found among the students, faculty, and the citizens of Houston
••• There is flexibility to meet individual needs and interests
••• Most students complete the required classroom courses in one year
••• Student teaching is an available option, not a requirement
••• Support is available to students during training and as they prepare for getting to the next step of their careers
••• Research opportunities are endless within the College and the Texas Medical Center, the largest incorporated medical center in the world
••• GSBS’s competitive stipend goes far given Houston’s low cost-of-living
••• Houston offers a unique blend of big-city benefits and small-town community

We're confident that the more you learn about us, the more you'll want to be a part of the exciting things happening here.
Discover A Great Place To Live

If the ability to rent a nice apartment—or even buy a home—as a graduate student appeals to you, then Houston is a good place for you. If enjoying the outdoors year-round and never having to shovel snow appeals to you, then Houston is a good place for you. If large communities of many different cultures appeals to you, then Houston is a good place for you. If good food—at affordable prices—appeals to you, then Houston is a good place for you. If you like to fish, attend plays/operas/ballets/musicals/symphonies/art exhibits, shop, cheer on professional or collegiate sports teams, or take short drives to the beach, then Houston is a good place for you.

The fact is, Houston is a good place for a wide variety of people, which is why it’s the fourth largest city in the U.S. While its size brings with it all the big-city benefits, such as professional sports teams and outstanding cultural events, smaller communities are scattered throughout Houston that create a small-town atmosphere within the big city. Many people discover that they can find almost everything they need and want within a short drive from where they live. This is true for most of our graduate students, who live in nice neighborhoods that are within a bike ride of Baylor or in one of the plentiful apartments or condominiums located near campus.
OUTDOOR RECREATION
• 314 parks
• 95 miles of nature or hike and bike trails
• More than 100 public and private golf courses
• Houston Zoo
• A quick drive takes you to: the Kemah boardwalk, Galveston beaches, Clear Lake, Lake Conroe, Lake Livingston, and three state parks

SPORTS
• Professional football, baseball, men’s and women’s basketball, and ice hockey teams
• Collegiate sports at several universities
• Recreational leagues for those who want to play

DINING & ENTERTAINMENT
• More than 11,000 restaurants that feature nearly every type of cuisine and price range
• Night life options abound in the revitalized downtown area, as well as many other parts of town
• Theater District: award-winning theater, ballet, opera, and symphony within a 17-block area
• Museum District: 16 museums and galleries within a concentrated area
• Shopping galore, including the Galleria, one of the largest indoor shopping complexes in the nation

FAMILY LIFE
• Job opportunities in a variety of industries
• Quality child care options are plentiful
• There are more than 20 local school districts, as well as many accredited private schools
• Lots of kid-friendly activities including the Houston Zoo, the Children’s Museum of Houston, Six Flags AstroWorld, and Space Center Houston

STUDENT HOUSING/TRANSPORTATION
• There are lots of affordable homes, apartments, townhouses, and condominiums for lease or purchase near the Texas Medical Center (TMC)
• Many of these living options are close to a light rail system that provides access to the TMC
• Travel on the light rail and bus system is free, because BCM provides passes to its students
• Parking is available—for a fee—in remote lots with shuttle service to TMC
• On-campus garages are available after-hours and on weekends at reduced rates

The Graduate School provides students with FREE PASSES for public bus and light rail transportation, which runs through the Medical Center to apartments, restaurants and clubs, museums, theaters, and professional sporting venues.

Houston has earned its reputation as an URBAN FOREST, thanks in large part to the city’s 314 developed parks and more than 200 open spaces totaling over 18,000 acres.

Houston has a YOUNG, MULTI-CULTURAL POPULATION: 71 percent of residents are under the age of 44 and more than 90 languages are spoken throughout the city.

Houston is a COASTAL CITY with some of the country’s most diverse saltwater fishing opportunities available in the nearby waters of the Gulf of Mexico.
Baylor College of Medicine is located in the heart of the Texas Medical Center (TMC), the largest incorporated medical center in the world. With more than 42 member institutions in 100 buildings on 800 acres, there’s no denying that TMC is big geographically, but what is really impressive is the number of big ideas being explored in laboratories and clinics throughout the Medical Center. Virtually every method, model system, and research instrument can be found here, and the collaborative spirit among TMC institutions means that graduate students can tap into this vast array of resources when working on their Ph.D. research.
By virtue of the name, you might think that the TMC is all about patient care. State-of-the-art medical care is certainly a core component of the Medical Center, but the place is also a research powerhouse and an educational giant. TMC institutions committed more than $3.5 billion—yes, billion with a b—to research in the last five years and there are more than 22,000 students and health-related trainees at 11 educational institutions:

- Baylor College of Medicine
- Michael E. DeBakey High School for Health Professions, part of Houston ISD
- Houston Community College System
- Prairie View A&M University
- Rice University
- Texas A&M University System
- Texas Southern University
- Texas Woman’s University
- University of Houston System
- The University of Texas Health Science Center at Houston
- The University of Texas M. D. Anderson Cancer Center

Despite its size, getting to the various TMC institutions usually only involves a short walk. There is a trolley bus system that runs throughout the Medical Center as well.

Bottom line: the Texas Medical Center is a unique environment that offers phenomenal opportunities for graduate student researchers.
Working with students, the GSBS faculty has developed a series of courses that meets the educational needs of specific graduate programs and provides a breadth of knowledge that allows students to incorporate ideas from different research areas—an increasingly critical skill as research becomes more interdisciplinary. These courses are taught by faculty who volunteer their time and therefore bring a high level of commitment to the education process. The courses are taught at the graduate level and cover fundamental aspects of modern biomedical research.

Although the majority of our students take most of these courses, individual programs tailor the curriculum to meet the unique requirements of their area of research and the specific needs of each student. More specialized required and elective courses are also offered by most departments and graduate programs. More details about the GSBS curriculum and these specialized courses can be found online at www.bcm.edu/gradschool/grad-curriculum.html.

We know students are anxious to start doing the research that interests them, so the core curriculum at The Graduate School of Biomedical Sciences at BCM is arranged so that you can be finished with all your classes in one year.
CHOOSING A FACULTY MENTOR
A critical component of each student’s first year at GSBS is rotating through a variety of laboratories in order to select the faculty mentor that is best for them. Students have the opportunity to spend eight weeks in three to five different laboratories before making this important decision. Each GSBS graduate program has many faculty members who are conducting fascinating research, so choosing between them will likely be the most difficult part of this process.

QUALIFYING EXAM
The next step toward a Ph.D. is completing a qualifying exam sometime during the second year. Each graduate program designs its own exam, but they all require the student to describe and defend a research proposal.

DISSERTATION RESEARCH
Your dissertation research is when you get to put all that book knowledge into practice in the lab. One of the great things about pursuing a Ph.D. is that you get to choose to explore an area of research that really interests you. To help you design and carry out your thesis project is your faculty mentor, who—along with your faculty advisory committee—is there to guide and support you throughout this important phase of training.

Each student completes a dissertation describing the results of their original research. Most students have multiple publications that constitute the core of their dissertation. These papers are frequently published in high-quality, peer-reviewed journals (see specific Graduate Program web sites for details). The dissertation defense involves a public seminar and oral defense to the faculty advisory committee.

YEAR 1
- Required and Elective Courses
- 3-5 Laboratory Rotations
- Choose Mentor

YEAR 2
- Develop Thesis Project with Mentor
- Begin Conducting Research
- Complete a Qualifying Exam
- Assemble Thesis Advisory Committee
- Advance to Candidacy

YEARS 2-GRADUATION
- Conduct Dissertation Research
- Meet with Faculty Mentor and Thesis Advisory Committee
- Attend Seminars, Department Conferences, National and International Meetings
- Publish Papers
- Write and Defend Ph.D. Thesis
DEPARTMENTAL PROGRAMS

These are graduate programs based in an independent BCM Academic Department.

BIOCHEMISTRY & MOLECULAR BIOLOGY

The Biochemistry & Molecular Biology program features cross-disciplinary approaches to research in biochemistry, cell biology, developmental biology, and structural biology.

IMMUNOLOGY

The Department of Immunology offers an outstanding graduate program with training in a wide range of basic and translational research. Faculty research encompasses cancer immunology and inflammatory mechanisms, gene therapy and genetic vaccines, immune-related diseases such as asthma and AIDS, lymphocyte activation; development of T and B lymphocytes and dendritic cells, and antigen presentation.

MOLECULAR AND HUMAN GENETICS

The Graduate Program in Molecular and Human Genetics provides training in classical and modern genetics of humans and model organisms, bioinformatics, and genomics. The broad research interests of the Department include the principles of DNA replication and repair, DNA recombination, cell division, aging, cancer, development, learning, memory and social behavior.

MOLECULAR AND CELLULAR BIOLOGY

The Department of Molecular and Cellular Biology is internationally acclaimed for its outstanding research and graduate program. Faculty research interests are diverse and include: aging, cancer biology (breast, prostate and skin), cell cycle regulation, chromatin and transcription factors, cellular signaling, developmental biology, diabetes and molecular metabolism, molecular biology of nuclear receptors and co-activators, molecular genetics and KO mice, gene therapy, molecular neurobiology, reproductive biology and stem cell biology.

NEUROSCIENCE

Graduate studies in Neuroscience provide training from leading investigators on how the molecular, cellular, and network properties of the brain give rise to processes such as attention, reasoning, memory, perception, and motor control in health and disease throughout the lifespan. Graduates are extremely competitive for obtaining prestigious positions at leading biomedical and liberal arts academic research institutions and in industry.

MOLECULAR PHYSIOLOGY & BIOPHYSICS

The Department of Molecular Physiology & Biophysics utilizes world-class technologies to understand disease mechanisms. The faculty members are very interactive with ongoing research in the areas of learning and memory, cell mobility, protein structure and function, Alzheimer’s disease, cancer, skeletal muscle diseases, Sandhoff’s disease, cyclic fibrosis, and cardiovascular disease.

MOLECULAR VIROLOGY & MICROBIOLOGY

The Ph.D. program in Molecular Virology & Microbiology offers comprehensive and multidisciplinary training in virology and microbiology, and their many health-related implications.

PHARMACOLOGY

The Department of Pharmacology’s faculty members are involved in a variety of research interests in pharmacology and molecular biology. Program graduates are equipped with the tools and knowledge required to attack the unsolved problems of drug actions, gene regulation, control of the cell cycle, and the development of new drugs and approaches to medical problems.

IMMUNOLOGY

The Department of Immunology offers an outstanding graduate program with training in a wide range of basic and translational research. Faculty research encompasses cancer immunology and inflammatory mechanisms, gene therapy and genetic vaccines, immune-related diseases such as asthma and AIDS, lymphocyte activation; development of T and B lymphocytes and dendritic cells, and antigen presentation.

MOLECULAR AND HUMAN GENETICS

The Graduate Program in Molecular and Human Genetics provides training in classical and modern genetics of humans and model organisms, bioinformatics, and genomics. The broad research interests of the Department include the principles of DNA replication and repair, DNA recombination, cell division, aging, cancer, development, learning, memory and social behavior.

MOLECULAR AND CELLULAR BIOLOGY

The Department of Molecular and Cellular Biology is internationally acclaimed for its outstanding research and graduate program. Faculty research interests are diverse and include: aging, cancer biology (breast, prostate and skin), cell cycle regulation, chromatin and transcription factors, cellular signaling, developmental biology, diabetes and molecular metabolism, molecular biology of nuclear receptors and co-activators, molecular genetics and KO mice, gene therapy, molecular neurobiology, reproductive biology and stem cell biology.

NEUROSCIENCE

Graduate studies in Neuroscience provide training from leading investigators on how the molecular, cellular, and network properties of the brain give rise to processes such as attention, reasoning, memory, perception, and motor control in health and disease throughout the lifespan. Graduates are extremely competitive for obtaining prestigious positions at leading biomedical and liberal arts academic research institutions and in industry.

MOLECULAR PHYSIOLOGY & BIOPHYSICS

The Department of Molecular Physiology & Biophysics utilizes world-class technologies to understand disease mechanisms. The faculty members are very interactive with ongoing research in the areas of learning and memory, cell mobility, protein structure and function, Alzheimer’s disease, cancer, skeletal muscle diseases, Sandhoff’s disease, cyclic fibrosis, and cardiovascular disease.

MOLECULAR VIROLOGY & MICROBIOLOGY

The Ph.D. program in Molecular Virology & Microbiology offers comprehensive and multidisciplinary training in virology and microbiology, and their many health-related implications.

PHARMACOLOGY

The Department of Pharmacology’s faculty members are involved in a variety of research interests in pharmacology and molecular biology. Program graduates are equipped with the tools and knowledge required to attack the unsolved problems of drug actions, gene regulation, control of the cell cycle, and the development of new drugs and approaches to medical problems.

IMMUNOLOGY

The Department of Immunology offers an outstanding graduate program with training in a wide range of basic and translational research. Faculty research encompasses cancer immunology and inflammatory mechanisms, gene therapy and genetic vaccines, immune-related diseases such as asthma and AIDS, lymphocyte activation; development of T and B lymphocytes and dendritic cells, and antigen presentation.

MOLECULAR AND HUMAN GENETICS

The Graduate Program in Molecular and Human Genetics provides training in classical and modern genetics of humans and model organisms, bioinformatics, and genomics. The broad research interests of the Department include the principles of DNA replication and repair, DNA recombination, cell division, aging, cancer, development, learning, memory and social behavior.

MOLECULAR AND CELLULAR BIOLOGY

The Department of Molecular and Cellular Biology is internationally acclaimed for its outstanding research and graduate program. Faculty research interests are diverse and include: aging, cancer biology (breast, prostate and skin), cell cycle regulation, chromatin and transcription factors, cellular signaling, developmental biology, diabetes and molecular metabolism, molecular biology of nuclear receptors and co-activators, molecular genetics and KO mice, gene therapy, molecular neurobiology, reproductive biology and stem cell biology.

NEUROSCIENCE

Graduate studies in Neuroscience provide training from leading investigators on how the molecular, cellular, and network properties of the brain give rise to processes such as attention, reasoning, memory, perception, and motor control in health and disease throughout the lifespan. Graduates are extremely competitive for obtaining prestigious positions at leading biomedical and liberal arts academic research institutions and in industry.

MOLECULAR PHYSIOLOGY & BIOPHYSICS

The Department of Molecular Physiology & Biophysics utilizes world-class technologies to understand disease mechanisms. The faculty members are very interactive with ongoing research in the areas of learning and memory, cell mobility, protein structure and function, Alzheimer’s disease, cancer, skeletal muscle diseases, Sandhoff’s disease, cyclic fibrosis, and cardiovascular disease.

MOLECULAR VIROLOGY & MICROBIOLOGY

The Ph.D. program in Molecular Virology & Microbiology offers comprehensive and multidisciplinary training in virology and microbiology, and their many health-related implications.

PHARMACOLOGY

The Department of Pharmacology’s faculty members are involved in a variety of research interests in pharmacology and molecular biology. Program graduates are equipped with the tools and knowledge required to attack the unsolved problems of drug actions, gene regulation, control of the cell cycle, and the development of new drugs and approaches to medical problems.

IMMUNOLOGY

The Department of Immunology offers an outstanding graduate program with training in a wide range of basic and translational research. Faculty research encompasses cancer immunology and inflammatory mechanisms, gene therapy and genetic vaccines, immune-related diseases such as asthma and AIDS, lymphocyte activation; development of T and B lymphocytes and dendritic cells, and antigen presentation.

MOLECULAR AND HUMAN GENETICS

The Graduate Program in Molecular and Human Genetics provides training in classical and modern genetics of humans and model organisms, bioinformatics, and genomics. The broad research interests of the Department include the principles of DNA replication and repair, DNA recombination, cell division, aging, cancer, development, learning, memory and social behavior.

MOLECULAR AND CELLULAR BIOLOGY

The Department of Molecular and Cellular Biology is internationally acclaimed for its outstanding research and graduate program. Faculty research interests are diverse and include: aging, cancer biology (breast, prostate and skin), cell cycle regulation, chromatin and transcription factors, cellular signaling, developmental biology, diabetes and molecular metabolism, molecular biology of nuclear receptors and co-activators, molecular genetics and KO mice, gene therapy, molecular neurobiology, reproductive biology and stem cell biology.

NEUROSCIENCE

Graduate studies in Neuroscience provide training from leading investigators on how the molecular, cellular, and network properties of the brain give rise to processes such as attention, reasoning, memory, perception, and motor control in health and disease throughout the lifespan. Graduates are extremely competitive for obtaining prestigious positions at leading biomedical and liberal arts academic research institutions and in industry.

MOLECULAR PHYSIOLOGY & BIOPHYSICS

The Department of Molecular Physiology & Biophysics utilizes world-class technologies to understand disease mechanisms. The faculty members are very interactive with ongoing research in the areas of learning and memory, cell mobility, protein structure and function, Alzheimer’s disease, cancer, skeletal muscle diseases, Sandhoff’s disease, cyclic fibrosis, and cardiovascular disease.
The Structural and Computational Biology & Molecular Biophysics Program is interdisciplinary and cross-institutional, enlisting faculty from six institutions in the Houston area. Research activities include quantitative and physical approaches to molecular and cell biology, biophysics, genomics, proteomics, neuroscience, neurobiology, molecular design, drug design, and medicine.

**Cell and Molecular Biology**

Cell and Molecular Biology is an interdepartmental and multidisciplinary program with more than 95 faculty members whose research interests include: disease mechanisms; gene regulation; developmental biology; signal transduction; structural & computational biology; aging; cancer; cell cycle & growth control; genomics & proteomics; microbiology; virology; and immunology. The program provides a flexible curriculum and fosters faculty-student interactions by means of individual counseling, small group courses, seminars, and a research symposium.

**Translational Biology & Molecular Medicine**

Translational Biology & Molecular Medicine is an interdepartmental program uniquely designed to provide outstanding training in biomedical research at the interface of the basic sciences and clinical medicine.

**Developmental Biology**

The Interinstitutional Program in Developmental Biology provides a wide spectrum of exciting research possibilities and a broad cross-disciplinary training in molecular biology, cell biology, biochemistry, genetics, and genomics. How a single cell develops into a complex organism is at the forefront of basic science research and is of direct and fundamental relevance to human development, disease, and stem cell therapy. Students typically graduate with an excellent publication record and go on to successful careers.

**Cardiovascular Sciences**

The Cardiovascular Sciences Graduate Program of the DeBakey Heart Center is an interdepartmental program offering an integrated study of the cardiovascular system. Research directions range from mechanisms and etiology of various cardiovascular diseases, atherosclerosis, congestive heart failure, ischemia and hypertension to an in-depth study of normal control mechanisms of cardiac, skeletal and smooth muscle at a variety of levels.

**Clinical Scientist Training Program**

The Clinical Scientist Training Program is committed to educating and training highly motivated individuals to become successful, independent clinical investigators and future leaders in academic medicine and biomedical research. It is designed primarily for junior faculty and senior sub-specialty fellows. You must have an appointment at BCM in order to be eligible to apply for this program.

**Combined Degree Programs**

These are graduate programs for BCM medical students, faculty, and fellows.

**Combined M.D./Ph.D. Program**

Combined M.D./Ph.D. degree training at BCM, located in the largest medical center in the world, gives future physician scientists the opportunity to learn and work in an environment conducive to tremendous growth and success that can lead to significant scientific contributions in future research endeavors and clinical practice.

**CLINICAL SCIENTIST TRAINING PROGRAM**

The Clinical Scientist Training Program is committed to educating and training highly motivated individuals to become successful, independent clinical investigators and future leaders in academic medicine and biomedical research. It is designed primarily for junior faculty and senior sub-specialty fellows. You must have an appointment at BCM in order to be eligible to apply for this program.
GETTING THE MOST OUT OF GRADUATE SCHOOL

•• “Thriving, Not Just Surviving, as a Scientist” workshops, including:
  - Goals for graduate school
  - Reading the scientific literature
  - Preparing for exams
  - Choosing an advisor
  - Preparing for the oral exam
  - Writing abstracts
  - Preparing slides and figures
  - Preparing posters
  - Preparing short talks
  - Preparing seminars
  - Manuscript writing
  - Thesis preparation
•• Advisor for international students
•• Advisor for under represented students
•• NIH Funded Initiative for Maximizing Student Diversity Program
•• Coordinator for students with disabilities

CAREER RESOURCES
•• Career Resource Center
•• Annual Career Day
•• Career Counseling
www.bcm.edu/gradschool/grad-careers.html

RESEARCH RESOURCES
•• Core Facilities at BCM
  www.bcm.edu/research/corelabs.cfm
  - Genetically Engineered Mouse Core
  - Microarray core
  - Microscopy core
  - Histology core
  - Tissue culture core
  - Proteomics core
  - Sequencing core
•• Computational biology core
•• Department Symposia and Seminars
•• Annual Graduate Student Symposium
•• Student Seminars
•• Journal Clubs
•• Education Resource Center at BCM
  http://ercweb.bcm.tmc.edu
•• Houston Academy of Medicine-Texas Medical Center Library, one of only eight Regional Medical Libraries in the nation, which provides free electronic access to most journals
  http://resource.library.tmc.edu

OTHER EXTRAS
•• Onsite athletic facility
•• Free public transportation passes
•• Onsite Starbucks Coffee Cafe
•• Graduate Student Lounge open 24/7 with a pool table, ping pong tables, TV, and stereo

Without a doubt, the dissertation research conducted by students is the most critical component of their training, and The Graduate School of Biomedical Sciences offers a number of resources to help students meet their research goals quickly and effectively. In addition, the GSBS understands that students may need additional support in order to reach their maximum potential.

www.bcm.edu/gradschool/grad-resources.html
TEACHING EXPERIENCE
Although teaching assistantships are not required of our graduate students, those who are interested in teaching can take advantage of opportunities to teach graduate courses at BCM.

INTERNSHIP PROGRAMS
To help our students explore different career paths, internship opportunities are available to provide practical experience in fields such as:

• intellectual property law
• biotechnology
• education

WORKING WITH YOUNG STUDENTS
Graduate students have opportunities to make a difference in the lives of young students through programs such as:

• Graduate Teaching Fellows in K-12 Education, which pairs graduate students with K-12 teachers to assist with biology needs for disadvantaged and underrepresented students
• Judging student science fair projects
• Mentoring undergraduates in the SMART Summer Research Program

COURSES AT OTHER INSTITUTIONS
In order to enhance our students’ classroom and laboratory experiences, BCM has established arrangements with several outstanding institutions that allow our full-time students to enroll—for full credit and with no tuition or registration fees—in courses that apply to their degree program at:

• Rice University
• The University of Texas Graduate School of Biomedical Sciences
• The University of Texas School of Public Health
• The University of Houston
• Texas A&M University
• The University of Texas Medical School at Houston

M.D./Ph.D. PROGRAM
Baylor College of Medicine is one of only 39 institutions awarded a competitive Medical Scientist Training Program grant supported by the National Institute of General Medical Sciences of the NIH. The program provides integrated scientific and medical training leading to the combined M.D./Ph.D. degree to highly motivated students with outstanding research and academic potential. The program’s goal is to prepare its graduates to function independently in both basic research and clinical investigation.

ADDITIONAL EDUCATIONAL OPPORTUNITIES
Enrolling at The Graduate School of Biomedical Sciences at BCM opens doors to a wealth of educational opportunities—both within the College and with other outstanding institutions—that allow our students to customize their training to fit their individual career goals.
Discover the Career Possibilities

Most people who pursue a Ph.D. degree enjoy a good mystery. They are people who are curious about the world and are driven to find answers to questions that intrigue them. Everyone likes to have answers, but what sets scientists apart is the appeal of the discovery process… finding the path to the answer is a lure in and of itself.

The Graduate School of Biomedical Sciences at BCM is designed to be an exciting training ground for those who are interested in honing their problem-solving skills. By working closely with faculty, students learn how to formulate scientific hypotheses, design and carry out experiments to test them, and then communicate these results to the scientific community.

One of the great things about earning a Ph.D. is that these skills can be applied in a variety of careers:

• conducting research in academic settings
• conducting research in pharmaceutical and biotechnology companies
• teaching
• using your expertise as a scientist in government agencies such as the Department of Energy, the Department of Defense, and the Environmental Protection Agency
• applying your scientific knowledge in fields such as intellectual/patent law, law enforcement, business, and journalism

GREAT PERKS
The wide range of career options is one of many perks available to those with a Ph.D. in the biomedical sciences. Perhaps most important is that the vast majority of Ph.D.s enjoy what they do. In fact, biologists are ranked as having the highest job satisfaction. Other benefits include working with other accomplished people in the scientific community, collaborating with others toward a common goal, and the opportunity to travel throughout the country and around the world. Many jobs also offer a work environment that appeals to many Ph.D.s: flexible hours, casual dress, and the ability to work independently.

CAREER ASSISTANCE
So how do you land these jobs? The Graduate School at BCM is here to help. We offer a Career Resource Center that helps educate students about the full range of career possibilities, provides career counseling, and maintains a job board and electronic mail listserve to notify students of employment opportunities. The Graduate School also sponsors a Career Day Symposium, where speakers from a wide variety of industries describe their career paths and current positions.
In addition to the outstanding educational opportunities for current graduate students, BCM offers exceptional learning experiences for those considering careers in research.

**HIGH SCHOOL PROGRAM**

**Summer Science for Seniors Program**
- 8-week summer program for rising high school seniors in the Houston area
- Participants are paid to conduct research in BCM laboratories and attend a series of college preparatory discussions including a college and scholarship workshop for students and their parents
- www.bcm.edu/smart/smart_pgs/s_cubed.htm

**UNDERGRADUATE PROGRAM**

**SMART Program (Summer Medical And Research Training)**
- 9-week summer research program for 80-100 college students from across the nation
- Participants receive a competitive salary to conduct research in BCM laboratories and attend daily seminars designed for undergraduates
- The program also offers a SMART GRE preparation course, career development activities, and personal career counseling
- During the program, students stay in dorms located at nearby Rice University
- Typically, 30 percent of participants are from underrepresented populations
- www.bcm.edu/smart

**POST-BACCALAUREATE PROGRAM**

**SMART PREP Scholars Program**
- Program to help underrepresented college graduates prepare for biomedical Ph.D. study
- Takes from 9 months to 2 years to complete the program, depending on each scholar’s individual development plan
- Participants are paid a competitive salary to work as technicians and conduct research at BCM
- The program offers a course in molecular and cellular biology, and workshops to prepare for the GRE and graduate school application process, as well as individual tutoring and individual counseling
- All applicants must be U.S. citizens or permanent residents of the U.S. and must have completed college within the last three years
- www.bcm.edu/diversityprograms/mrg_pgs/postbac.htm
It’s not often that a school’s costs are a perk for students, but that’s the case at BCM’s GSBS. First, our graduate students pay no tuition—this cost is paid for by The Graduate School. Instead of charging our graduate students for their training, we recognize their contributions to the College’s research efforts by paying them stipends.

Sure, most schools offer stipends, but what sets us apart is that all GSBS students receive a stipend that is competitive with graduate programs at the top 10 universities in the country, based on NIH funding, and they receive it during their entire course of study.

When you consider the low cost of living in Houston, the stipend goes a lot further here than most places. In 2005, the annual stipend was $23,000. The stipend is increased regularly, so check out www.bcm.edu/gradschool for the current funding level.

To sweeten the deal even more, a “Dean’s Award for Excellence” pays an additional $2,000 per year stipend to those students who choose to compete for and are successful in securing a predoctoral fellowship during their graduate training. Twenty-five of our students are currently receiving these supplements in honor of their research excellence.

Other freebies for BCM graduate students are personal health insurance—GSBS picks up the tab for your premium—and a free pass for public bus and light rail transportation.

So, GSBS offers an amazing education with a ton of support and the price is right... ready to sign up?
ADMISSIONS INFORMATION

Here again, GSBS is kind to your pocket book—there is no fee for applying. Just go to www.bcm.edu/gradschool/grad-application.html and complete the online application.

REQUIREMENTS & RECOMMENDATIONS

- You must either have, or be in the final stages of a program leading to, a bachelor’s degree or equivalent. GSBS has a diverse student body with backgrounds in biology, biochemistry, biomedical sciences, bioengineering, engineering, math or physics.
- There are no formal course requirements for admission, but the following classes provide a good background for graduate coursework:
  - Biology (with laboratory)
  - Chemistry
  - General Inorganic
  - Organic
  - Mathematics (Calculus preferred)
  - Physics (with laboratory)
- Most successful applicants have a GPA above 3.0 and GRE scores near the 70th percentile, and if required, either a TOEFL score better than 250 (equivalent to 600 on the older paper-based test) or an IELTS score better than band 6.
- Prior research experience, either in a summer program or part-time during school, is also important preparation for graduate school.
- Other requirements may be established by individual graduate programs. Applicants should consult their prospective programs for details.

SELECTION CRITERIA

It goes without saying that you have to be intelligent to earn a Ph.D., but if you think it all comes down to only your GPA and GRE scores, you’re wrong. At BCM, we understand that intelligence is reflected in ways beyond these two measures. To us, great students are much more than numbers—they are individuals with many facets. Therefore, the application provides opportunities for students to share information about themselves and their academic and research background, and every effort is made in the admissions process to assess all characteristics of each applicant.

Baylor College of Medicine believes that diversity within the student body enhances the educational environment for all; therefore, we welcome applicants with diverse backgrounds and experiences. We are committed to promoting equal opportunity for all who are interested in research careers, and several outstanding programs are in place to increase the number of scientists from underrepresented populations.

STATS ON RECENT ENTERING CLASSES

- Approximately 1,300 applied annually
- 100 first-year students enrolled
- One-half were women
- One-third graduated from foreign colleges
- Average GPA was 3.5
- Average GRE (analytical, quantitative, and verbal) was greater than the 70th percentile

APPLICATION & SUPPORTING MATERIALS

We think you’ll find that the application is straightforward, but it’s important to point out that we allow students to select two graduate programs for consideration. With so many top-notch faculty (many of whom are in more than one program) and interesting graduate programs from which to choose, we know selecting only one can be difficult. We encourage applicants to apply early and list two programs, because some stipends are paid from federal training grants that can only be used to support U.S. citizens or permanent residents and because programs can fill up quickly. Once your application is completely filled out and submitted, the review process will begin. If the first program you list is unable to accept your application, it will automatically be sent to the second for consideration. Acceptance into either choice means you have the opportunity to train at one of the finest research institutions in the country.

You will also be asked to write two short essays. One is a description of your research experience, which is a very important consideration in the admission process. The essay should describe your previous research experience, including details of the project, what you did, what you learned, and the significance of the work. If you do not have research experience, you can use this essay to explain why and focus on your desire to be a scientist and other characteristics that make you suitable for graduate school. The other essay is a personal statement that can include discussions of your interest in science and your motivation to pursue a career as a research scientist.

We also require three letters of recommendation. The most effective letters are from a research supervisor and other people who know you and your abilities well.

PERSONAL INTERVIEWS

Applicants who are invited for interviews have the opportunity to personally meet with GSBS faculty and students, see the campus and the facilities, and get a taste of the city of Houston—all at no cost to the student. The graduate program pays for transportation, food, and lodging.
IMPORTANT DATES

JANUARY 1
Application deadline; however, early application is encouraged since the review process begins in November/December. Late applications will be considered on a space-available basis.

FEB/MARCH
Interviews are held by individual programs

FEB/MARCH/APRIL
Admission offers are extended

APRIL 15
Final decision by students to accept an offer

FIRST MONDAY OF AUGUST
Classes begin

Admissions for other times during the year may be considered on a case-by-case basis.

APPLICATION MATERIALS

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SPECIFICATIONS</th>
<th>WHERE TO SEND</th>
</tr>
</thead>
<tbody>
<tr>
<td>A completed application form, including: grades, GRE test scores, a personal statement, and a description of research experience</td>
<td>No application fee</td>
<td><a href="http://www.bcm.edu/gradschool/">www.bcm.edu/gradschool/</a></td>
</tr>
<tr>
<td>Official transcript(s)</td>
<td>In envelopes sealed by the school</td>
<td>Mailed directly to The Graduate School</td>
</tr>
<tr>
<td>Official results from the Graduate Records Exam (GRE)</td>
<td>The GRE must have been taken within the last three years</td>
<td>Request that the Educational Testing Service send your GRE scores directly to The Graduate School, Baylor College of Medicine in Houston (#6052)</td>
</tr>
<tr>
<td>Advanced test not required, but may be recommended by specific programs.</td>
<td>Must have been taken within the last three years</td>
<td>Mailed from the testing service directly to The Graduate School, Baylor College of Medicine in Houston</td>
</tr>
<tr>
<td>The TOEFL or IELTS examination is required for students who do not have a degree from an English-speaking university.</td>
<td></td>
<td>Mailed directly from the recommender to The Graduate School</td>
</tr>
<tr>
<td>Three letters of recommendation</td>
<td>On letterhead in sealed envelopes</td>
<td></td>
</tr>
<tr>
<td>At least one from a previous or current mentor.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MAILING ADDRESS
The Graduate School of Biomedical Sciences
Baylor College of Medicine
One Baylor Plaza, Room N204
Houston, TX 77030-3411
Since The Graduate School of Biomedical Sciences at BCM was founded in 1947, it has conferred close to 1,100 Ph.D. degrees. Today, our alumni can be found all over the globe, where they are creating bodies of knowledge that would probably not exist if not for their intellect and efforts. Others chose less traditional career paths and are making contributions in a wide range of industries.

Of our recent graduates, about 15 percent were participants in the M.D./Ph.D. program and went on to finish their medical training. Among our other alumni, 80 percent moved on to post-doctoral fellowships at institutions across the country, and the other 20 percent chose to further their education or to enter the work force.
In the world of scientific exploration, there are many mysteries to unravel. What areas of research fascinate you?

The Graduate School of Biomedical Sciences at Baylor College of Medicine offers 14 programs that lead to a Ph.D., as well as a highly competitive M.D./Ph.D. program. Each of these paths has outstanding faculty to serve as expert guides for those interested in joining them on their particular quest for discovery.

The first step in your journey is to determine where you want to focus your investigative interests. Read on to get an overview of each program and where to find more details.
Our graduate program provides a wonderful opportunity to witness the development of scientific knowledge on many fronts, from protein function at an atomic level to systems biology. Our program is especially well suited to inquisitive students who are stimulated by intellectual diversity and who embrace cross-disciplinary approaches to research. Scientific interactions are promoted by regularly scheduled student seminars, research meetings, journal clubs, and a Department conference. A Departmental seminar is held weekly at which internationally known scientists present their research. The Department also sponsors a major seminar series that invites prominent scientists to discuss their research and the impact of science on society during the day-long Verna and Marrs McLean Lectures in Biochemistry. The research and educational activities of the Department are further enhanced by financial support provided by an endowment from the McLean Foundation. Thus, the physical, intellectual, and financial resources available in the Department for graduate education are enormous and serve to propel students to the forefront of scientific discovery.

The Verna and Marrs McLean Department of Biochemistry & Molecular Biology provides research training in biochemistry, cell biology, developmental biology, and structural biology. The diversity of research activities is an important feature of the Departmental environment and details about these activities can be found in the faculty research descriptions on our website.

Our graduate program provides a wonderful opportunity to witness the development of scientific knowledge on many fronts, from protein function at an atomic level to systems biology. Our program is especially well suited to inquisitive students who are stimulated by intellectual diversity and who embrace cross-disciplinary approaches to research. Scientific interactions are promoted by regularly scheduled student seminars, research meetings, journal clubs, and a Department conference. A Departmental seminar is held weekly at which internationally known scientists present their research. The Department also sponsors a major seminar series that invites prominent scientists to discuss their research and the impact of science on society during the day-long Verna and Marrs McLean Lectures in Biochemistry. The research and educational activities of the Department are further enhanced by financial support provided by an endowment from the McLean Foundation. Thus, the physical, intellectual, and financial resources available in the Department for graduate education are enormous and serve to propel students to the forefront of scientific discovery.

The Cardiovascular Sciences Graduate Program of the DeBakey Heart Center is an interdepartmental program leading to Ph.D. and M.D./Ph.D. degrees in the integrated study of the cardiovascular system. The goal of our program is to present students with opportunities to become knowledgeable in the range of fundamental expertise necessary to develop a well-focused study within the broad discipline of cardiovascular biology. Present research directions range from mechanisms and etiology of various cardiovascular diseases, atherosclerosis, congestive heart failure, ischemia and hypertension to an in-depth study of normal control mechanisms of cardiac, skeletal and smooth muscle at a variety of levels, from "genes to organisms." This progressive approach to the study of the cardiovascular system is supported by a training grant from the National Heart, Lung and Blood Institute of the National Institutes of Health.
The Interdepartmental Program in Cell and Molecular Biology (CMB) was initiated in 1988 in a grass roots effort by BCM faculty to establish a multidisciplinary, student-oriented and interdepartmental graduate program. Every outstanding graduate program incorporates the same three features: challenging coursework, great choices of thesis labs, and supervision and support throughout the students’ thesis research. We ensure that the CMB program excels in all three of these areas by emphasizing a flexible curriculum, diverse and outstanding research environment, and faculty-student interactions.

In addition to the comprehensive first-year Core Curriculum offered by the BCM Graduate School, CMB students can pursue their interests within our flexible required courses. With more than 95 investigators committed to mentoring the next generation of scientists, the CMB Program provides exposure to an astonishing diversity of philosophies and approaches to biological science. A unique aspect of CMB is the Directors’ Course, which is limited to the 10-13 first-year students, and is team-taught by Co-Directors and other CMB faculty. The goals of this very popular course are to develop the skills required to identify and address significant biological questions, and to critically describe and discuss scientific papers and proposals. Since its inception, the CMB program has been a collegial group of students and faculty who are excited about science and interested in sharing that excitement.

Clinical investigation is defined as hypothesis-driven, patient-oriented research on human subjects (or on material of human origin, such as tissues), in conjunction with laboratory measurements as appropriate, in clinical biology, natural history, prevention, screening, diagnosis, therapeutic interventions, clinical trials, epidemiology of disease, behavior, mechanism of disease, and the efficacy and effectiveness of health care delivery. Included in this definition is “translational” research, which bridges the application of information between the laboratory and new methods of diagnosis, treatment, and prevention. Excluded from the definition are in vitro studies that utilize human tissue but do not deal directly with patients.

Both the Ph.D. and M.S. programs are designed for individuals with a significant commitment to clinical research. The Ph.D. degree will take 4-5 years, and the M.S., 2-3 years. Participants will take three courses designed specifically for the program: Fundamentals of Clinical Investigation, Clinical Investigation for the Career Scientist, and a Seminar Series. They will also take electives that might include biostatistics, epidemiology, and other courses related to their research. In their first year, scholars will write an NIH K23 grant proposal, and these studies will then be written up as a thesis.
The major research interests are: neurobiology, cancer biology, cell death, neurodegenerative and other human diseases, stem cell biology, gene therapy, reproductive development, oogenesis, muscle, heart, kidney, bone, skin, limb, and eye development, cell lineage specification, X chromosome dosage compensation, and plant differentiation. Students typically graduate with an excellent publication record, as the average number of publications per graduate student is above 4.5, with an average of more than 2.5 first author papers. The average impact factor per graduate student publication is more than 10. The Program is interinstitutional and interdepartmental. Faculty are drawn from 11 departments and three institutions—Baylor College of Medicine, The University of Texas M.D. Anderson Cancer Center, and Rice University. Cooperative and collaborative interactions among program laboratories and institutions enable students to take full advantage of the facilities of the Texas Medical Center all within easy walking distance.

The field of Developmental Biology is integrative. In order to understand how a single cell develops into a complex organism, we use cell and molecular biology, genetics, biochemistry, imaging, and genomics. Studies of organisms—as diverse as social molds, worms, flies, frogs, chickens, fish, mice and humans—are conducted using a wide variety of approaches, instruments, and techniques of modern biological research. Members of the Program in Developmental Biology study basic biological mechanisms of direct and fundamental relevance to human development and disease. This allows us to unravel the principles and mechanisms that guide embryonic development, the differentiation of adult cell types, regeneration, and aging.

Required and elective courses, completed in the first year, offer students broad exposure to molecular biology, biochemistry, genetic engineering, genetic vaccines and gene therapy, cellular and clinical immunology. Our students also complete a specialized course, Introduction to Graduate Research, which emphasizes problem solving, critical thinking, oral and graphical data presentation, and grant writing. Students may rotate through as many as four laboratories in their first year to find the best project/mentor match.

Department of Immunology students graduate with at least one first authored publication in a peer-reviewed journal. To see a list of our students’ publications and postdoctoral locations, visit our website or request a Department of Immunology brochure from immuno@bcm.edu.

The development of vaccines saved millions of lives in the 20th century. Now, in the 21st century, the Department of Immunology is conducting cutting edge research on the eradication of cancers and inflammatory diseases. Improvements in gene therapy and genetic vaccines, the mechanics of immune mediated diseases such as asthma, autoimmunity, and AIDS, are a prime research focus. Basic research of lymphocyte and dendritic cell development and the signaling of immune responses translate into greater understanding of the immune system and lay the groundwork for the discovery of new therapies in the future.

Students typically graduate with an excellent publication record, as the average number of publications per graduate student is above 4.5, with an average of more than 2.5 first author papers. The average impact factor per graduate student publication is more than 10. The Program is interinstitutional and interdepartmental. Faculty are drawn from 11 departments and three institutions—Baylor College of Medicine, The University of Texas M.D. Anderson Cancer Center, and Rice University. Cooperative and collaborative interactions among program laboratories and institutions enable students to take full advantage of the facilities of the Texas Medical Center all within easy walking distance.

The major research interests are: neurobiology, cancer biology, cell death, neurodegenerative and other human diseases, stem cell biology, gene therapy, reproductive development, oogenesis, muscle, heart, kidney, bone, skin, limb, and eye development, cell lineage specification, X chromosome dosage compensation, and plant differentiation. Students typically graduate with an excellent publication record, as the average number of publications per graduate student is above 4.5, with an average of more than 2.5 first author papers. The average impact factor per graduate student publication is more than 10. The Program is interinstitutional and interdepartmental. Faculty are drawn from 11 departments and three institutions—Baylor College of Medicine, The University of Texas M.D. Anderson Cancer Center, and Rice University. Cooperative and collaborative interactions among program laboratories and institutions enable students to take full advantage of the facilities of the Texas Medical Center all within easy walking distance.

The field of Developmental Biology is integrative. In order to understand how a single cell develops into a complex organism, we use cell and molecular biology, genetics, biochemistry, imaging, and genomics. Studies of organisms—as diverse as social molds, worms, flies, frogs, chickens, fish, mice and humans—are conducted using a wide variety of approaches, instruments, and techniques of modern biological research. Members of the Program in Developmental Biology study basic biological mechanisms of direct and fundamental relevance to human development and disease. This allows us to unravel the principles and mechanisms that guide embryonic development, the differentiation of adult cell types, regeneration, and aging.

The major research interests are: neurobiology, cancer biology, cell death, neurodegenerative and other human diseases, stem cell biology, gene therapy, reproductive development, oogenesis, muscle, heart, kidney, bone, skin, limb, and eye development, cell lineage specification, X chromosome dosage compensation, and plant differentiation. Students typically graduate with an excellent publication record, as the average number of publications per graduate student is above 4.5, with an average of more than 2.5 first author papers. The average impact factor per graduate student publication is more than 10. The Program is interinstitutional and interdepartmental. Faculty are drawn from 11 departments and three institutions—Baylor College of Medicine, The University of Texas M.D. Anderson Cancer Center, and Rice University. Cooperative and collaborative interactions among program laboratories and institutions enable students to take full advantage of the facilities of the Texas Medical Center all within easy walking distance.
MOLECULAR AND CELLULAR BIOLOGY

www.bcm.edu/mcb

For more than 30 years, the Molecular and Cellular Biology Department (MCB) has provided state-of-the-art education to more than 200 Ph.D. professionals. It has thrived under the expert leadership of Dr. Bert W. O'Malley and outstanding, internationally acclaimed research faculty.

MCB garners more than $33 million dollars in research funding from external sources and ranks number one among U.S. medical school anatomy/cell biology departments in NIH funding. Faculty research interests are diverse and include: aging, cancer biology (breast, prostate and skin), cell cycle regulation, chromatin and transcription factors, cellular signaling, developmental biology, diabetes and molecular metabolism, molecular biology of nuclear receptors and co-activators, molecular genetics and KO mice, gene therapy, molecular neurobiology, reproductive biology and stem cell biology. Although the research activity in the Department is intensive, the faculty pride themselves on providing a friendly, interactive, and exciting environment for graduate students. MCB students organize their own Graduate Student Symposium, are recipients of many national awards, and travel frequently to national meetings. Our faculty is also proud of the fact that our graduates go on to successful careers in academia, industry, and medicine.

MOLECULAR AND HUMAN GENETICS

http://igen.bcm.tmc.edu/molgen/graduateprogram

The Graduate Program in Molecular and Human Genetics provides outstanding educational opportunities for students who wish to pursue a career in the broad field of genetics. Students in the program obtain rigorous training in modern biology with an emphasis on genetics.

Students participate in cutting-edge research on a variety of topics and publish their work in the best peer-reviewed journals in the world. The research interests of the Department span a broad range, including the principles of DNA replication and repair, DNA recombination, cell division, aging, cancer, development, learning, memory and social behavior. We use a variety of model organisms from E. coli through yeast and Dictyostelium to flies and mice and we have a strong research program in bioinformatics and genomics as well. Studies in model organisms are tightly integrated with studies on the genetic basis of the human condition. Our research program addresses a variety of genetic diseases and students may obtain experience in both the basic and the clinical aspects of the research.
The faculty members are very interactive with ongoing research in the areas of learning and memory, cell motility, protein structure and function, Alzheimer’s disease, cancer, skeletal muscle diseases (myasthenia gravis, muscular dystrophy, malignant hyperthermia, central core disease), Sandhoff’s disease, cystic fibrosis, and cardiovascular disease. The Department occupies 18,000 square feet of contiguous space with recently constructed laboratories equipped for electrophysiology, spectroscopy, protein biochemistry, automated peptide synthesis and microsequencing, multi-photon and confocal microscopy, X-ray crystallography, magnetic resonance imaging (MRI), echocardiography, recombinant DNA technology, and a state-of-the-art Departmental core facility dedicated to the rapid production and characterization of transgenic and knockout mouse models of disease. Additional goals of the Department include translating basic research advances and breakthroughs into actual applications to improve human health. In concert with the ongoing studies, the Department offers the opportunity to train students in translational research.

The Department of Molecular Physiology & Biophysics utilizes the most current technologies in order to understand the mechanisms of normal and disease processes. Our world-class facilities allow investigators to study the impact of diseases from the molecular level to the whole organism.

The faculty members are very interactive with ongoing research in the areas of learning and memory, cell motility, protein structure and function, Alzheimer’s disease, cancer, skeletal muscle diseases (myasthenia gravis, muscular dystrophy, malignant hyperthermia, central core disease), Sandhoff’s disease, cystic fibrosis, and cardiovascular disease. The Department occupies 18,000 square feet of contiguous space with recently constructed laboratories equipped for electrophysiology, spectroscopy, protein biochemistry, automated peptide synthesis and microsequencing, multi-photon and confocal microscopy, X-ray crystallography, magnetic resonance imaging (MRI), echocardiography, recombinant DNA technology, and a state-of-the-art Departmental core facility dedicated to the rapid production and characterization of transgenic and knockout mouse models of disease. Additional goals of the Department include translating basic research advances and breakthroughs into actual applications to improve human health. In concert with the ongoing studies, the Department offers the opportunity to train students in translational research.

We have entered an era where a microbe can be sequenced in a day. Genomic and proteomic approaches promise rapid progress and insights into virulence factors, antibiotic resistance, microbial effects on host functions, the communal nature of some microbes, and unique host-pathogen interactions that may provide targets for therapy. The 21st century will be the “biological century,” reflecting giant leaps in our understanding of biological systems and microbes are likely to lead the way in application of our new understanding. The Department of Molecular Virology & Microbiology will continue to play a leading role in this exciting century. The Ph.D. program allows specialization in molecular virology or molecular microbiology, with the goal of producing innovative research scientists prepared to address the most important problems in biology today and tomorrow. Students receive comprehensive and multidisciplinary training in virology and microbiology, and their many health-related implications. The faculty has diverse but complementary interests and internationally recognized research programs and research training opportunities are as broad as the research interests of the faculty.
**NEUROSCIENCE**

http://neuro.neusc.bcm.tmc.edu

Understanding the brain and the implementation of its function (the mind) is one of the greatest challenges of science and medicine. Disorders of thought, emotion, memory, and sensory/motor performance have a major impact on the daily lives of individuals and society. Modern neuroscience utilizes a broad arsenal of multi disciplinary experimental approaches to interrogate the nervous system at many levels. The coursework, research, and training opportunities in Neuroscience afford access to a wide range of experimental and conceptual skills, encouraging students to develop truly interdisciplinary dissertation projects.

The faculty strives to promote collaborative research efforts among the different disciplines, to maximize the interdisciplinary nature of the student’s education, and to prepare the student for the challenges of modern competitive biomedical research in the brain sciences. The faculty is drawn from several basic science and clinical departments and applies multiple levels of analysis. The research programs of the faculty include studies ranging from reduced systems such as isolated molecules or individual nerve or glial cells to interactions within complex neural circuits to human cognition. The highly successful and creative Neuroscience faculty utilizes these approaches to address major areas of contemporary brain research including brain disorders such as Alzheimer’s disease, epilepsy, sensory deficits, developmental disabilities, drug addiction, and psychiatric illnesses including anti-social behaviors.

**PHARMACOLOGY**

www.bcm.edu/pharmacology

The Department of Pharmacology offers a program of advanced study in Pharmacology that offers unique opportunities for education and creative research in an exciting environment. Students will enrich and broaden their training through exposure to the entire spectrum of basic and clinical biomedical research, as well as contact with leading scientists in those disciplines. Graduates of the Department of Pharmacology are equipped with the tools and knowledge required to attack the unsolved problems of drug actions, gene regulation, control of the cell cycle, and the development of new drugs and approaches to medical problems.

The current thrust of the Department is the molecular biology of cancer cells. The array of topics under investigation ranges from the analysis of the mechanisms that control gene expression to the identification of the molecular lesions caused by exogenous and endogenous mutagens and carcinogens. Through an approach combining modern biochemical and molecular technologies, such as hybridoma and recombinant DNA techniques, we are dissecting the mechanisms involved in the control of the cell cycle and gene expression in cancer and normal cells. In addition, several faculty members are actively engaged in clinical pharmacology research including monitoring the effectiveness of anti-cancer drugs, mechanisms of seizure in epileptics and effects of psychotropics.
The availability of resources from the six participating institutions makes the SCBMB Program one of the most diverse and stimulating learning environments in the United States. The program trains students, who come from diverse fields, to understand the language of different disciplines. Bringing together so many backgrounds facilitates interdisciplinary interaction and also provides unique perspectives that students would not get in a program which primarily recruits biology students. To encourage the diversity of our students, a flexible curriculum is offered and tailored to meet student’s individual research interests. Students are eligible to enroll in courses free of charge at neighboring institutions. Specialized seminars expand the knowledge and depth of the student’s overall educational experience. Having the opportunity to interact with faculty through this mechanism provides the opportunity for collaborations and sub-interest groups to develop.

The truly interdisciplinary nature of the Program is one of its most attractive features, and our location in the largest medical center in the world provides endless opportunities for learning, collaborating, and interacting with top-notch scientists.

The Structural and Computational Biology & Molecular Biophysics (SCBMB) Program, one of the first of its kind, was founded in 1992 when a group of Baylor faculty saw a need to bring together students with backgrounds in biology, physical science or computation who wanted to apply those skills to biomedical problems with non-traditional approaches.

The availability of resources from the six participating institutions makes the SCBMB Program one of the most diverse and stimulating learning environments in the United States. The program trains students, who come from diverse fields, to understand the language of different disciplines. Bringing together so many backgrounds facilitates interdisciplinary interaction and also provides unique perspectives that students would not get in a program which primarily recruits biology students. To encourage the diversity of our students, a flexible curriculum is offered and tailored to meet student’s individual research interests. Students are eligible to enroll in courses free of charge at neighboring institutions. Specialized seminars expand the knowledge and depth of the student’s overall educational experience. Having the opportunity to interact with faculty through this mechanism provides the opportunity for collaborations and sub-interest groups to develop.

The truly interdisciplinary nature of the Program is one of its most attractive features, and our location in the largest medical center in the world provides endless opportunities for learning, collaborating, and interacting with top-notch scientists.

Translational Biology & Molecular Medicine is a unique interdisciplinary program designed to train investigators focused on biomedical research at the interface of the basic sciences and clinical medicine.

The program is designed to train a new generation of Ph.D. and M.D./Ph.D. biomedical researchers whose primary goals and training are oriented toward human health research. Over 100 faculty from all of the basic and clinical science departments and clinical research centers provide students with a broad spectrum of research opportunities related to every aspect of molecular medicine and human diseases. These include cancer, digestive system disorders, diseases of cardiac muscle, endocrine diseases/diabetes, genetic disorders, hemodynamic disorders, thrombosis and shock, infectious diseases, inflammation and immune disorders, musculoskeletal disorders, neurological disorders, psychiatric disorders, renal system disorders, reproductive disorders, respiratory system disorders, and vascular system diseases. Unique aspects of the program include dual mentoring by a basic scientist and a clinical scientist, novel courses created to teach molecular mechanisms and pathobiology of disease, the fundamentals of conducting human research, clinical rotations relevant to the research projects, seminars and journal clubs targeted to disease mechanisms and treatment, and training in translation of bench research into clinical application. Graduates are prepared to bridge basic research to clinical medicine.
MEDICAL SCIENTIST TRAINING PROGRAM

www.bcm.edu/mstp/no_flash.html

The Medical Scientist Training Program (MSTP) at Baylor College of Medicine is designed for highly motivated students. The program, while emphasizing continuity between clinical and basic sciences curricula, provides training that can lead to significant scientific contributions in academic and corporate research, clinical practice or a combination of both.

There are research opportunities for MSTP students in any of the 14 graduate programs at BCM.

A distinctive medical school curriculum approved for M.D./Ph.D. students offers sufficient flexibility to complete all medical studies in three years.

During the first two years in the program, students complete the pre-clinical basic science curriculum and clinical clerkships. During the second year students select a specific program for their graduate studies. After successfully defending their thesis and receiving their Ph.D., participants return to medical school to complete the clinical curriculum. The overall training period typically is 6 - 7 years depending on the time needed to complete graduate school course work and Ph.D. thesis research.