



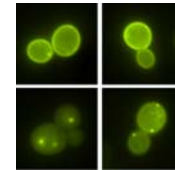
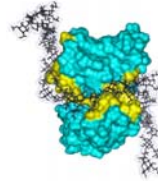
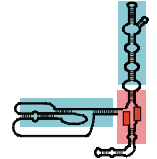
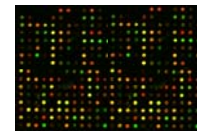
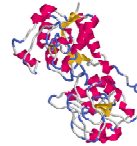
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If you have a disability and need assistance in order to obtain this brochure in an alternative format, please contact the Department of Biochemistry and Molecular Biology at (706) 542-1334.

July 2002

DEPARTMENT OF  
**Biochemistry  
& Molecular Biology**  
1785  
THE UNIVERSITY OF GEORGIA



### Cover Photos

Top:  
Life Sciences Building, University of Georgia.

Middle (top, left to right):  
Ribbon diagram of Gnt-V (J. Prestegard).  
*P. furiosus* microarray data (M. Adams).  
Telomerase RNA diagram (M. Terns).

Middle (bottom, left to right):  
Surface antigen from group B streptococcus (R. Woods).  
Ras2p localization in various yeast backgrounds (W. Schmidt).  
A small section of a plant xyloglucan (W. York).

Bottom:  
Various images of the University of Georgia.



DEPARTMENT OF BIOCHEMISTRY AND MOLECULAR BIOLOGY  
B122 LIFE SCIENCES BUILDING  
THE UNIVERSITY OF GEORGIA • ATHENS, GA 30602 USA  
(706) 542-1334 • FAX: (706) 542-1738  
<http://www.uga.edu/~biochem/>

## Description of the Program

The department of Biochemistry & Molecular Biology (BCMB) is in the Franklin College of Arts and Sciences. The College offers both MS and PhD degrees in a variety of scientific disciplines, including Biochemistry and Molecular Biology.

Graduate students are usually admitted at the beginning of fall semester, but in special cases a student with previous experience may be admitted in January. **Deadline for all fellowships and assistantships is January 1**, but exceptional qualifications may lead to awards at other times.

In addition to the courses listed in the curriculum (see [www.uga.edu/~biochem](http://www.uga.edu/~biochem)), a number of interdisciplinary courses are available to interested students in the BCMB program. The listings in Biology, Botany, Cellular Biology, Genetics and Microbiology should be consulted to determine the range of courses available to graduate students majoring in Biochemistry and Molecular Biology; see [www.gradsch.uga.edu](http://www.gradsch.uga.edu) for the online graduate bulletin.

For additional questions/concerns about the program, please contact the Biochemistry and Molecular Biology Graduate Coordinator, Dr. Alan Przybyla ([przybyla@bmb.uga.edu](mailto:przybyla@bmb.uga.edu), 706-542-1728).

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## Degree Descriptions

### MS

In general, the MS is completed in 2-4 years of full time attendance. The Graduate School specifies that all requirements for this degree be completed within six years, beginning with the first registration for graduate courses included on the final program of study.

### Ph.D.

Students entering the doctoral program with a bachelor's degree usually require 4-6 years of full time work. Students entering the program with a Master's degree usually require 3-4 years of full time work. The Graduate School specifies that all requirements for this degree, except the dissertation and final oral defense, be completed within a period of six years dating from the time of first registration for graduate courses on the final program of study.

## Research Faculty Holding Graduate Faculty Appointments

### Narayan, Prema

E-mail: [narayan@bmb.uga.edu](mailto:narayan@bmb.uga.edu)  
Office: B320B Life Sciences, Phone: 542-1721, Lab: B322 Life Sciences, Lab Phone: 542-1718  
*Research:* Transgenic mouse models for constitutively active luteinizing hormone receptors.

### Rose, John

E-mail: [rose@bcl4.bmb.uga.edu](mailto:rose@bcl4.bmb.uga.edu)  
Office: B204B Life Sciences, Phone: 542-1750  
*Research:* X-ray crystallography as applied to structural biology and structural genomics.

### Terns, Rebecca

E-mail: [rterns@bmb.uga.edu](mailto:rterns@bmb.uga.edu)  
Office: A326 Life Sciences, Phone: 542-1703, Lab: A328 Life Sciences, Lab Phone: 542-3520  
*Research:* Assembly and transport of RNA-protein complexes that are implicated in cancer and neuromuscular disease, and analysis of related complexes in hyperthermophilic archaea.

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## Distinguished Ph.D. Graduates of the Department

**James N. Ihle, Ph.D. (1971).** *Thesis:* Regulation of enzyme synthesis during embryogenesis and germination of cotton. *Current Position:* Professor and Chair – Biochemistry Dept., St Jude Children's Research Hospital, Memphis, TN.

**D. Mack Ivey, Ph.D. (1987).** *Thesis:* Generation of energy during CO<sub>2</sub> fixation in acetogenic bacteria. *Current Position:* Assoc. Professor, Dept. of Biological Sciences, University of Arkansas, Fayetteville, AR.

**Richard McCann, Ph.D. (1995).** *Thesis:* Identification and characterization of CKM1 and CDC37 as physiological partners of *Saccharomyces cerevisiae* casein kinase II. *Current Position:* Assistant Professor, Dept. of Biochemistry, University of Kentucky, Lexington, KY.

**William C. Merrick, Ph.D. (1971).** *Thesis:* Changes in isoaccepting tRNA species during germination of cotton seeds. *Current Position:* Professor, Dept. of Biochemistry, School of Medicine, Case Western Reserve University, Cleveland, OH.

**Michael R. Moore, Ph.D. (1975).** *Thesis:* Isolation and kinetic properties of methylene-tetrahydrofolate dehydrogenase from *Clostridium formicoaceticum*. *Current Position:* Professor, Dept. of Biochemistry and Molecular Biology, Marshall University, School of Medicine, Huntington, WV.

**William E. O'Brien, Ph.D. (1971).** *Thesis:* The synthesis of acetate from carbon dioxide by *Clostridium formicoaceticum*. *Current Position:* Professor, Dept. of Molecular and Human Genetics, Baylor College of Medicine, Houston, TX.

**Ramesh Padmanabha, Ph.D. (1989).** *Thesis:* A biochemical and genetic analysis of yeast casein kinase II. *Current Position:* Senior Research Scientist, Bristol Myers-Squibb, Wallingford, CT.

**Stephen W. Ragsdale, Ph.D. (1983).** *Thesis:* Electron transfer reactions involved in acetogenic bacteria. *Current Position:* Professor, Dept. of Biochemistry, University of Nebraska, Lincoln, NE.

**Craig Reed, Ph.D. (1995).** *Thesis:* Biochemical and molecular genetic analysis of casein kinase II regulatory subunit function. *Current Position:* Project Manager, Chemical and Biological Defense Division, Southern Research Institute, Frederick, MD.

**Christopher F. Reilly, Ph.D. (1982).** *Thesis:* The structural and functional characteristics of human leukocyte cathepsin G. *Current Position:* Vice President, AstraZeneca, Macclesfield, England.

**Sangram Sisodia, Ph.D. (1985).** *Thesis:* Structural and functional comparison of nucleic acid helix destabilizing protein and lactate dehydrogenase 5 of rat. *Current Position:* Thomas Reynolds Sr. Family Professor of Neurosciences and Director - The Center for Molecular Neurobiology, The University of Chicago, Chicago, IL.

**William S. York, Ph.D. (1996).** *Thesis:* Development and application of spectroscopic methods for the structural analysis of xyloglucans and xyloglucan oligosaccharides. *Current Position:* Assistant Professor, Dept. of Biochemistry and Molecular Biology, University of Georgia, Athens, GA.

## Departmental Research Areas

### Przybyla, Alan E.

E-mail: przybyla@bmb.uga.edu

Office: A420B Life Sciences, Phone: 542-1728, Lab: A422 Life Sciences, Lab

Phone: 542-1720

*Research:* Our laboratory employs recombinant technology to investigate the role of Beta Amyloid peptide fibrilization in the onset of Alzheimer's disease.

### Puett, J. David

E-mail: puett@bmb.uga.edu

Office: B129 Life Sciences, Phone: 542-1676, Lab: B302A / B322 Life Sciences,

Lab Phone: 542-1724 / 542-1718

*Research:* Molecular & cellular biochemical endocrinology emphasizing G protein-coupled receptors & tumor biology.

### Schmidt, Walter K.

E-mail: wschmidt@bmb.uga.edu

Office: A408A Life Sciences, Phone: 583-8241, Lab Phone: 583-8242

*Research:* Molecular and biochemical analyses of eukaryotic proteases required for the maturation of prenylated signaling molecules.

### Terns, Michael P.

E-mail: mterns@bmb.uga.edu

Office: A326B Life Sciences, Phone: 542-1896, Lab: A328 Life Sciences, Lab

Phone: 542-3520

*Research:* Biogenesis, transport, and function of cellular RNAs and RNA-based gene therapy agents.

### Tiemeyer, Michael

E-mail:

Office: , Phone:, Lab:, Lab Phone:

*Research:*

### Jeff Urbauer

E-mail:

Office: , Phone:, Lab:, Lab Phone:

*Research:*

### Wang, B. C.

E-mail: wang@bc11.bmb.uga.edu

Office: B204A Life Sciences, Phone: 542-1747, Lab: B202 / B206 Life Sciences,

Lab Phone: 542-3384 / 542-3403

*Research:* Structure-function studies by X-ray diffraction, transcription proteins, structural genomics, phasing methods.

### Wells, Lance.

E-mail:

Office:, Phone:, Lab:, Lab Phone:

*Research:*

### Woods, Robert J.

E-mail: rwoods@ccrc.uga.edu

Office: 191 CCRC, Phone: 542-4454 Lab Phone: 542-0263

*Research:* Immunological carbohydrate-protein interactions studied by computational simulation and experimental methods.

### York, William S.

E-mail: will@ccrc.uga.edu

Office: 195 CCRC, Phone: 542-4628 Lab Phone: 542-4419

*Research:* Molecular dynamics and topology of polysaccharide networks in the cell walls of higher plants.

The Department of Biochemistry and Molecular Biology hosts a wide range of biochemical and molecular biological research that is funded by NIH, NSF, DOD and various other federal and private funding agencies.

### BIOINFORMATICS

Genomics and Proteomics

### CELL BIOLOGY AND SIGNAL TRANSDUCTION

Biosynthesis

Cell Cycle

Signal Transduction

### COMPLEX CARBOHYDRATES / GLYCOBIOLOGY

Animal Glycoconjugates

Microbial and Plant Polysaccharides

Structural Biology of Carbohydrates

### ENZYMES AND MECHANISMS

Glycosyl Transferases

Metalloenzymes

Thermophilic Enzymes

### MEDICINAL BIOCHEMISTRY

Endocrinology

Genetic Diseases / Gene Therapy

Human Diseases - Alzheimer's Disease, Arthritis and Joint Diseases,

Bacterial Infection, Cancer, Cataracts, Cystic Fibrosis,

Emphysema, HIV, Porphyria

### PHYSICAL BIOCHEMISTRY

Bioluminescence / Fluorescence

Biophysical Methods

### PLANT BIOCHEMISTRY

Cell Walls

Development

Metabolism

### RNA: STRUCTURE, METABOLISM AND CATALYSIS

Ribozymes

RNA Processing / Trafficking

### STRUCTURAL BIOLOGY

Crystallography

Mass Spectrometry

Molecular Modeling

NMR

### THERMOPHILIC ORGANISMS

Metabolism and Bioenergetics

## Inter-Departmental Research Areas

The faculty of the Biochemistry and Molecular Biology are engaged in various inter-departmental efforts, including:

**THE BIOMEDICAL HEALTH SCIENCES INSTITUTE (BHSI)** facilitates and promotes interdisciplinary research and instructional efforts at UGA in the fields of biomedical and health sciences with the goal of improving the understanding of human health and disease.

**THE CENTER FOR BIOLOGICAL RESOURCES RECOVERY** conducts basic research in areas related to the use of microorganisms in biotechnology and in solving environmental and ecological problems.

**THE CENTER FOR METALLOENZYME STUDIES (CMS)** consists of numerous University of Georgia faculty from various disciplines and departments, all of whom have research interests in the study of metals in biology.

**THE COMPLEX CARBOHYDRATE RESEARCH CENTER (CCRC)** conducts basic research to study the structure and function of complex carbohydrates, and trains scientists from the U.S. and around the world in the principles, methods, and analytical techniques used to study complex carbohydrates.

**THE COMPUTATIONAL CENTER FOR MOLECULAR STRUCTURE AND DESIGN (CCMSD)** focuses on understanding molecular structures and interactions, as well as developing new computational procedures (primarily in the area of molecular mechanics and molecular modeling methods).

**THE GEORGIA X-RAY CRYSTALLOGRAPHY CENTER** aims to develop new approaches and techniques in X-ray crystallography for an improved understanding of how structure relates to function in biological macromolecules.

**THE PLANT CENTER** is focused on the cellular and molecular aspects of plant growth and development, plant genome organization and function, the application of molecular and genetic tools to improve cultivated plants, and in understanding organisms that interact with plants.

**THE SOUTHEAST COLLABORATORY FOR STRUCTURAL GENOMICS (SECSG)** is one of seven original pilot centers for structural genomics established by the NIH. It aims to develop, integrate, and test all of the constituents for carrying out cost-effective and high throughput structural genomics research.

**THE SOUTHEAST COLLABORATORY FOR HIGH-FIELD BIOMOLECULAR NMR** is an inter-institutional resource dedicated to the development and application of new NMR methods for biomolecular studies. It provides 900 MHz NMR access in addition to existing 800 MHz access.

### **Glover, Claiborne V. C.**

E-mail: [glover@arches.uga.edu](mailto:glover@arches.uga.edu)  
Office: A414A Life Sciences, Phone: 542-1769, Lab: A410 Life Sciences, Lab Phone: 542-1768

*Research:* Protein phosphorylation in budding yeast.

### **Lanzilotta, William N.**

E-mail: [wlanzilo@bmb.uga.edu](mailto:wlanzilo@bmb.uga.edu)  
Office: A128B Life Sciences, Phone: 542-1324, Lab Phone: 542-1738

*Research:* Crystallographic investigation of nutrient sensing, transport, and metabolism by enteric pathogens.

### **Lee, John W.**

E-mail: [jlee@arches.uga.edu](mailto:jlee@arches.uga.edu)  
Office: A120A Life Sciences, Phone: 542-1764, Lab: A116 Life Sciences / A126 Life Sciences, Lab Phone: 542-1764

*Research:* Mechanism and structure of bioluminescence proteins.

### **Ljungdahl, Lars G.**

E-mail: [larsljd@arches.uga.edu](mailto:larsljd@arches.uga.edu)  
Office: A214 Life Sciences, Phone: 542-1846, Lab: A210 / A216 Life Sciences, Lab Phone: 542-1086

*Research:* Autotrophic fixation of CO<sub>2</sub> and hydrolysis of plant polysaccharides by anaerobic bacteria and fungi.

### **Mendicino, Joseph F.**

E-mail: [mendicino@bmb.uga.edu](mailto:mendicino@bmb.uga.edu)  
Office: B210A Life Sciences, Phone: 542-3010, Lab: B212 Life Sciences, Lab Phone: 542-3010

*Research:* Role of glycosyltransferases and sulfotransferases in the pathology of Cystic Fibrosis.

### **Mohnen, Debra**

E-mail: [dmohnen@ccrc.uga.edu](mailto:dmohnen@ccrc.uga.edu)  
Office: 145 CCRC, Phone: 542-4458

*Research:* Biosynthesis and function of the plant cell wall polysaccharide pectin and the effects of pectin on human health.

### **Moremen, Kelley W.**

E-mail: [moremen@arches.uga.edu](mailto:moremen@arches.uga.edu)  
Office: B314A Life Sciences, Phone: 542-1705, Lab: B316 Life Sciences, Lab Phone: 542-1706

*Research:* Structure, function, mechanism of action, and regulation of enzymes in mammalian glycoprotein biosynthesis and catabolism.

### **Orlando, Ron**

E-mail: [orlando@ccrc.uga.edu](mailto:orlando@ccrc.uga.edu)  
Office: 165 CCRC, Phone: 542-4429

*Research:* Solving biological / biomedical problems with mass spectrometry.

### **Pierce, J. Michael**

E-mail: [hawkeye@arches.uga.edu](mailto:hawkeye@arches.uga.edu)  
Office: B314B Life Sciences, Phone: 542-1702, Lab: B316 Life Sciences, Lab Phone: 542-1701

*Research:* Glycosyltransferase regulation of tumor cell adhesion and invasion; structure / function of lectins.

### **Prestegard, James H.**

E-mail: [jpresteg@ccrc.uga.edu](mailto:jpresteg@ccrc.uga.edu)  
Office: 221 CCRC, Phone: 542-6281

*Research:* Application of Nuclear Magnetic Resonance Spectroscopy to the Characterization of Biologically Important Systems.



## Faculty

### **Adams, Michael W. W.**

E-mail: adams@bmb.uga.edu  
Office: B216B Life Sciences, Phone: 542-2060, Lab: B218 / A228 Life Sciences,  
Lab Phone: 542-1909 / 542-3023  
*Research:* Genomics, metabolism and enzymology of hyperthermophiles,  
organisms that grow near 100°C.

### **Adang, Michael J.**

E-mail: adang@arches.uga.edu  
Office: 427 Biological Sciences, Phone: 542-2436  
*Research:* Characterization of *Bacillus thuringiensis* toxins and receptors in  
insect midgut membranes.

### **Albersheim, Peter**

E-mail: palbersh@ccrc.uga.edu  
Office: 104 CCRC, Phone: 542-4404  
*Research:* Structures and functions of biologically active plant cell wall oligo-  
and polysaccharides.

### **Black, Clanton C.**

E-mail: ccblack@bmb.uga.edu  
Office: A314A Life Sciences, Phone: 542-1778, Lab: A310 Life Sciences, Lab  
Phone: 542-1780  
*Research:* Understanding the C4 pathway of photosynthetic metabolism, the  
daily regulation of Crassulacean acid metabolism, and sucrose metabolism in  
plants.

### **Brewer, John M.**

E-mail: brewer@bmb.uga.edu  
Office: A314B Life Sciences, Phone: 542-1773, Lab: A316 Life Sciences, Lab  
Phone: 542-1776  
*Research:* Relation between enolase subunit association and activity.

### **Carlson, Russell W.**

E-mail: rcarlson@ccrc.uga.edu  
Office: 167 CCRC, Phone: 542-4439  
*Research:* The structures and roles of bacterial glycoconjugates in microbe-plant  
and -animal interactions.

### **Dailey, Harry A.**

E-mail: hdailey@arches.uga.edu  
Office: A220B Life Sciences, Phone: 542-2690, Lab: A222 Life Sciences, Lab  
Phone: 542-7252  
*Research:* Studies on the regulation of heme synthesis and structure / function of  
heme pathway enzymes.

### **Darvill, Alan**

E-mail: adarvill@ccrc.uga.edu  
Office: 112 CCRC, Phone: 542-4411  
*Research:* Structures and functions of the noncellulosic polysaccharides of plant  
primary cell walls.

### **DerVartanian, Daniel V.**

E-mail: dervar@bmb.uga.edu  
Office: A220A Life Sciences, Phone: 542-4620, Lab: A218 Life Sciences / Biol.  
Science., Lab Phone: 542-1779 and 542-1693  
*Research:* Study of nickel-containing proteins or enzymes from heart tissue as  
marker for heart attacks.

## Facilities

The Department is housed, along with the Department of Genetics,  
in the Life Sciences building, a state-of-the-art laboratory complex.  
In addition to 80 modern research laboratories, the building contains  
teaching laboratories, administrative areas, lecture rooms, a  
scientific library, extensive animal quarters, a fermentation facility,  
and a fiber optic network.

The building also houses the Molecular Genetics Instrumentation  
Facilities, a support facility that provides various laboratory  
services, including DNA and peptide sequencing and synthesis,  
chromatography, mass spectrometry, automated proteomics services  
(high-throughput two-dimensional gel electrophoresis, multi-  
dimensional chromatography), and automated genomics services  
(microarray printing, single-nucleotide polymorphism analysis).  
Additional support facilities available at the University include a  
modern microscopy facility, a monoclonal antibody facility, a  
computer center, a glassblowing shop, a machine shop, and  
greenhouses.

The Department is conveniently located close to the University's  
Science Library which houses approximately 850,000 volumes of  
the total University holding of more than 2.7 million volumes  
(ranked 26 among all U.S. research libraries). The library  
subscribes to a wide range of scientific journals, and many of these  
can be accessed electronically.

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## Location and Quality of Life

The University of Georgia is located in historic Athens, a town of  
about 100,000 permanent residents. Athens is approximately an  
hour's drive east of Atlanta, a two-hour drive from the north  
Georgia mountains and the Appalachian trail, and a five-hour drive  
from the Atlantic and Gulf coasts. Numerous outdoor activities can  
be found in and around the Athens area.

The multi-cultural flavor of Athens is reflected by the wide range of  
restaurants that serve the community - Caribbean, Chinese, Greek,  
Italian, Jamaican, Japanese, Mexican, and Thai- and the many  
festivals, events, and outdoor concerts that are hosted by the city,  
often in conjunction with the University. The Athens' music scene  
is vibrant, having been the birthplace of internationally known  
music groups - B-52's and REM. The University also draws  
nationally renowned exhibits, performances, and concerts through  
the School of Music, the University Theater, and the Georgia  
Museum of Art.

The athletic facilities at the University of Georgia are among the  
nation's best. These facilities support several nationally ranked  
collegiate sports teams, have been used as Olympic venues, and are  
generally open to students for recreational use.

## Application and Admission

### General Requirements

Requirements for admission to graduate study in Biochemistry and Molecular Biology (BCMB) include a bachelor's degree from an accredited institution and the equivalent of an undergraduate major in Biochemistry, Chemistry, or another biological science. Students with majors in other areas are strongly encouraged to apply, with the understanding that deficiencies will be eliminated in the first year of residence.

### How to Apply

Application forms are available upon written request either to

- the BCMB Graduate Coordinator (przybyla@bmb.uga.edu), or
- the Department of Biochemistry and Molecular Biology, or
- the Graduate School, or
- online at <http://www.gradsch.uga.edu>.

You must submit:

- Official transcripts of all colleges and universities attended.
- Official Graduate Record Examination scores. Only the verbal and quantitative portions are required; arrangements for the GRE may be made through the Educational Testing Service, Box 555, Princeton, NJ 08540.
- TOEFL and TSE scores for foreign applicants.
- Three letters of recommendation by persons familiar with your academic credentials, training, and research potential.

### When to Apply

The majority of graduate students enter the program in the fall semester (August) of each year, as the core curriculum is offered chronologically beginning in the fall. Some exceptions are made for those with a strong biochemistry background or an MS degree from an accredited institution. The application deadline for financial support is January 1st, but occasionally, funding can be arranged at a later date for excellent candidates.

### Admission

The Graduate Affairs Committee determines admission to the BCMB Graduate Program. Admission guidelines are fairly flexible. In general, it is expected that prospective students have a GPA of 3.0, combined verbal and quantitative, GRE score of 1200, and excellent letters of recommendation. Foreign applicants must have competitive TOEFL and TSE scores. Other considerations such as laboratory experience, publication record, prior degrees, etc., may negate deficiencies in the three primary areas.

## Financial Support

The Department of Biochemistry and Molecular Biology makes every effort to provide financial support to graduate students that are enrolled full time in the M.S. or Ph.D. programs. Primary sources of support include university fellowships, and research and teaching assistantships. Students are also encouraged to obtain extramural fellowship support.

All applicants are considered for of the financial support possibilities described below:

**Presidential Graduate Fellowships** are aimed at exceptionally qualified students. This highly competitive award guarantees 5 years of support with a competitive annual stipend and a tuition waiver. Only citizens and legal permanent residents are eligible.

**Graduate School Assistantships** provide two years of support and are intended to allow students to develop their own research programs. After two years, students are typically supported by departmental research assistantships. One-third time service is required, and out-of-state fees are waived. Students are expected to provide 15 hours a service to the department each week in a way to be determined by the student, graduate coordinator, and chairman.

**Departmental Research Assistantships** are usually one-third time research positions that are supported by grants to individual faculty in this and other departments. Out-of-state fees are waived for research assistants who perform at least one-third time service. Applications for research assistantships are made directly to individual faculty members (invariably the prospective major professor).

**Departmental Teaching Assistantships** are awarded on a competitive basis by the Department. These assistantships carry a stipend for a twelve-month appointment. Out-of-state fees are waived for teaching assistants who perform at least one-third time service.

Generally, students in the Biochemistry and Molecular Biology graduate program are provided with annual stipends that are in line with the guidelines set forth by the National Institutes of Health and other federal funding agencies. The Southeast region enjoys a low cost of living, making these stipends of greater economic value than those offered elsewhere.