BIOMEDICAL SCIENCES - CELLULAR AND MOLECULAR BIOLOGY - PH.D.

College of Sciences and Humanities
School of Biomedical Sciences
www.kent.edu/biomedical

About This Program

You will take the lead in discovery as you design and conduct original research that advances understanding of cellular and molecular systems. Through close mentorship and rigorous training, you will sharpen your expertise and emerge ready to drive innovation in biomedical research, industry or higher education. Read more...

Contact Information

- **John Johnson** | BMS@kent.edu | 330-672-3849
- Connect with an Admissions Counselor

Program Delivery

- **Delivery:**
  - In person
- **Location:**
  - Kent Campus

Examples of Possible Careers and Salaries*

Biological science teachers, postsecondary

- 7.3% faster than the average
- 66,000 number of jobs
- $83,460 potential earnings

Medical scientists, except epidemiologists

- 8.7% much faster than the average
- 165,300 number of jobs
- $100,590 potential earnings

Biological scientists, all other

- 1.2% slower than the average
- 63,700 number of jobs
- $93,330 potential earnings

Natural sciences managers

- 3.7% about as fast as the average
- 104,300 number of jobs
- $161,180 potential earnings

* Source of occupation titles and labor data comes from the U.S. Bureau of Labor Statistics' Occupational Outlook Handbook. Data comprises projected percent change in employment over the next 10 years; nation-wide employment numbers; and the yearly median wage at which half of the workers in the occupation earned more than that amount and half earned less.

For more information about graduate admissions, visit the graduate admission website. For more information on international admissions, visit the international admission website.

Admission Requirements

- Bachelor's degree or higher from an accredited college or university
- Minimum 2.750 GPA on a 4.000-point scale
- Academic preparation adequate to complete graduate coursework in cell and molecular biology (recommended courses in chemistry, cell biology, genetics and biochemistry)
- Official transcript(s)
- Résumé or curriculum vitae
- Goal statement (applicants should describe their research experience and goals in pursuing an advanced degree)
- Three letters of recommendation
- English language proficiency - all international students must provide proof of English language proficiency (unless they meet specific exceptions to waive) by earning one of the following:[1]
  - Minimum 94 TOEFL iBT score
  - Minimum 7.0 IELTS score
  - Minimum 65 PTE score
  - Minimum 120 DET score

[1] International applicants who do not meet the above test scores will not be considered for admission.

Application Deadlines

- **Fall Semester**
  - Application deadline: November 15

All application materials (including applicable fee, transcripts, recommendation letters, etc.) submitted after this deadline will be considered on a space-available basis.

Program Requirements

Major Requirements

Code	Title	Credit Hours
Major Requirements		
BMS 70120	LABORATORY TECHNIQUES IN BIOMEDICAL SCIENCES (taken twice)	4
BMS 71000	RESPONSIBLE CONDUCT OF RESEARCH	1
BMS 71001	INTRODUCTION TO BIOMEDICAL SCIENCES	1
BMS 78637	BIOANTHROPOLOGICAL DATA ANALYSIS I	4-5
or BSCI 70104	BIOLOGICAL STATISTICS	
BMS 80110	CAREER AND PROFESSIONAL SKILLS FOR LIFE SCIENTISTS	2
BSCI 70143	EUKARYOTIC CELL BIOLOGY	3
BSCI 70144	SELECTED READINGS IN EUKARYOTIC CELL BIOLOGY	1
Graduate Electives, choose from the following:		13-44
Any Biological Sciences (BSCI) Doctoral Courses (70000 or 80000 level)		

	Any Biomedical Sciences (BMS) Doctoral Courses (70000 or 80000 level)	
	Other graduate courses as approved by guidance committee	
Culminating Requirement		
BMS 80199	DISSERTATION I [1]	30
Minimum Total Credit Hours for Post-Baccalaureate Students:		**90**
Minimum Total Credit Hours for Post-Master's Students:		**60**

[1] Upon completion of course requirements and candidacy exam, doctoral students must register for BMS 80199 for two semesters for a total of 30 credit hours. Thereafter, it is expected that a doctoral candidate will continuously register for BMS 80299 each semester until all requirements for the degree have been met. After completion of the candidacy examination, the dissertation committee will be established, consisting of the guidance committee and an outside member. Students will submit their prospectus for the dissertation to this committee. The format of the prospectus will parallel that utilized for NIH grant proposals (without biographical, budget and facilities information). The dissertation committee makes recommendations for reformulation until the proposal is acceptable or may reject it with specific reasons.

Graduation Requirements

Minimum Major GPA	Minimum Overall GPA
-	3.000

- Post-baccalaureate students must complete a minimum of 60 credit hours prior to enrolling in BMS 80199. Minimum 15 of the 60 credit hours must be letter-graded courses.
- Post-master's students must complete a minimum of 30 credit hours prior to enrolling in BMS 80199.

Program Learning Outcomes

Graduates of this program will be able to:

1. Publish their research in peer-reviewed journals.
2. Demonstrate the ability to teach undergraduate students.
3. Seek employment in fields that reflect their area of training.

Full Description

The Ph.D. degree in Biomedical Sciences–Cellular and Molecular Biology prepares creative research scientists for careers in teaching, research and biotechnology. Graduates possess an in-depth comprehension of experimental design at the cellular and molecular levels of biological organization, as well as competency in current techniques in the discipline. Major research emphases include signal transduction, biochemistry and pathobiology, gene regulation, cell systems biology, cell and tissue ultrastructure, membrane structure and function, molecular aspects of neurobiology and endocrinology, genetics and metabolism of microorganisms, virology and immunology and enzymology with an emphasis on protein dynamics and folding, as well as cytochrome P-450s.

The Ph.D. degree is offered in consortium with Cleveland Clinic and Northeast Ohio Medical University (NEOMED). Program faculty are drawn from several departments at Kent State and the other two institutions. Additional participant faculty are located at area clinical facilities and hospitals. This multi-departmental and inter-institutional structure gives doctoral candidates access to the talents of a broadly diverse research faculty as well as significant research facilities and resources.