

Iowa State University Library  
Department of Biochemistry, Biophysics and Molecular Biology  
Collection Development Policy

## **I. General Purpose**

Resources are selected to support the instructional and research needs of faculty, graduate, and undergraduate students in the Department of Biochemistry, Biophysics and Molecular Biology (BBMB). The department is involved in undergraduate programs (Biochemistry, Agricultural Biochemistry, Biophysics) and offers graduate work leading to M.S. and Ph.D. degrees. “The overall mission of the Department of Biochemistry, Biophysics, and Molecular Biology (BBMB) is to investigate and understand the molecular mechanisms underlying biological processes as explained by the principles of chemistry and physics.”

(<http://www.bbmb.iastate.edu/mission.shtml>)

## **II. History**

The department history was supplied by Lisa Gates, BBMB Administrative Specialist, on 12-17-2007.

“The Department of Biochemistry and Biophysics was formed in January 1960 from the assembly of seven faculty members from the existing Departments of Chemistry, Physics, and Botany. This nucleus established the departmental mission of seeking to understand biological functions in terms of the fundamental principles of chemistry and physics, which remains in place to this day. The undergraduate programs in Biochemistry and Biophysics were established at this time, as well as the graduate programs that were originally constituted by students in each of the seven laboratories at the time the department was formed. The faculty grew from seven to sixteen members over the first decade of the department's existence, providing a broad spectrum of biochemistry and biophysics research and teaching expertise. From that point the faculty size remained relatively stable for the next 25 years. In 1981 the department consisted of 18 tenure-track faculty members from a variety of fields including bioorganic chemistry, enzymology, molecular biology, biophysics, immunobiochemistry, and biochemical nutrition. That faculty was relatively established and mature, such that from 1982 to 1996 there was a total of only eight new additions to the unit and the size of the faculty remained stable with 19 members. A major change during the past decade was the sudden expansion of the faculty from 20 to 26 members during the reorganization of the biological science departments at the university. The departments of Botany, Zoology and Genetics, and Microbiology all were dissolved in 2002, and the members of those units were allowed the choice of joining either of two new departments, Genetics, Development, and Cell Biology (GDCB) or Ecology, Evolution, and Organismal Biology (EEOB), or moving into BBMB.”

The department is located in the Molecular Biology building. The following facilities are housed in the Molecular Biology Building: Biomolecular Nuclear Magnetic Resonance Facility, Protein Facility, Cell Facility, DNA Facility, Electron Microscopy Facility, and the Office of Biotechnology Instrumentation Facilities.

### III. Iowa State University Program

At the undergraduate level, BBMB offers majors in biochemistry or biophysics in the College of Liberal Arts and Sciences and a major in agricultural biochemistry in the College of Agriculture and Life Sciences. The department also offers a combined program that allows students to obtain two separate degrees, both the Bachelor of Science and Master of Science, in as few as five years. In addition, BBMB, Ecology, Evolution and Organismal Biology, and Genetics, Development and Cell Biology administer the undergraduate Genetics program.

At the graduate level, students can obtain an M.S. or Ph.D. in Biochemistry or Biophysics.

In addition, BBMB participates in several closely-related interdepartmental programs as follows:

The **Interdepartmental Genetics** Graduate Major is offered for the M.S. and Ph.D. degrees with a major or minor in genetics. There are thirteen participating departments. These include: Agronomy, Animal Science, BBMB, Ecology, Evolutionary and Organismal Biology, Entomology, Food Science and Human Nutrition, Horticulture, Genetics, Development and Cell Biology, Natural Resource Ecology and Management, Plant Pathology, Statistics, Veterinary Microbiology and Preventive Medicine, and Veterinary Pathology.

**Molecular, Cellular, and Developmental Biology (MCDB)** is an interdepartmental program that offers an M.S. or Ph.D. degree with a major in molecular, cellular, and developmental biology. Graduate study in MCDB is offered through several cooperating departments: Agronomy; Animal Science; Biochemistry, Biophysics and Molecular Biology; Biomedical Sciences; Entomology; Food Science and Human Nutrition; Genetics, Development and Cell Biology; Horticulture; Physics and Astronomy; Plant Pathology; Veterinary Microbiology and Preventive Medicine; and Veterinary Pathology.

The **Interdepartmental Plant Physiology Major (IPPM)** coordinates graduate education and research in the areas of plant biochemistry, plant molecular biology and plant physiology. Graduate study in IPPM, leading to the M.S. and Ph.D. degrees, is offered through the following departments: Agronomy, Biochemistry, Biophysics and Molecular Biology, Chemical and Biological Engineering, Ecology, Evolution and Organismal Biology, Genetics, Development and Cell Biology, Horticulture, and Plant Pathology.

The **Interdepartmental Toxicology** program offers both M.S. and Ph.D. degrees. Participating departments include: Agricultural and Biosystems Engineering, Agronomy, Animal Science, Biochemistry, Biophysics and Molecular Biology, Biomedical Sciences, Chemistry, Entomology, Food Science and Human Nutrition, Genetics, Development and Cell Biology, Geological and Atmospheric Sciences, Physics and Astronomy, Plant Pathology, Veterinary Diagnostic and Production Animal Medicine, Veterinary Microbiology and Preventive Medicine, and Veterinary Pathology.

The **Immunobiology** graduate program offers the Master of Science and Doctor of Philosophy degrees in the Immunobiology major. Participating departments include: Animal

Science, Biochemistry, Biophysics and Molecular Biology; Biomedical Science, Kinesiology, Veterinary Microbiology and Preventive Medicine, and Veterinary Pathology.

The **Bioinformatics and Computational Biology** graduate program offers the Doctor of Philosophy degree. Over 80 faculty from a variety of departments are affiliated with this interdisciplinary program.

The **Interdepartmental Neuroscience** Program at Iowa State University offers study leading to M.S. and Ph.D. degrees. Participating departments include: Animal Science, Biochemistry, Biophysics and Molecular Biology, Biomedical Sciences, Chemical Engineering, Computer Science, Genetics, Development and Cell Biology, Kinesiology, Microbiology, and Psychology.

BBMB faculty are also associated with the following campus initiatives: Bioeconomy Initiative, Baker Center for Bioinformatics and Biological Statistics, Center for Integrated Animal Genomics, and the Plant Sciences Institute.

#### **IV. Subject Boundaries**

The collection includes parts of the following sections of the Library of Congress classification schedules: QD, QH, and QP. Because of the interdisciplinary nature of BBMB, EEOB, and GDCB, there is a significant amount of subject overlap among the faculty and student researchers in these departments. Consequently, much of the related literature of potential interest to BBMB faculty and students is collected in other subject areas such as agronomy, animal science, botany, cellular biology, developmental biology, food science and human nutrition, genetics, horticulture, microbiology, immunology, plant pathology, and veterinary medicine.

#### **V. General Collection Guidelines**

##### **A. Linguistic.**

English is the primary language of new acquisitions. Purchases in other languages are usually only pursued if specifically requested by a faculty member or student researcher.

##### **B. Geographical Areas.**

Not applicable.

##### **C. Types of Materials Collected.**

The library collects journals, other serial publications, monographs, conference proceedings, technical reports, and electronic databases. The library receives relevant government materials, especially technical reports, through the GPO depository program.

##### **D. Format of Materials Collected.**

Materials are acquired in print, microform, compact disc, DVD, and on the World Wide Web. Journals are collected in print and electronic formats. Web access to full-text journals is desirable and the preferred format among faculty and students. Monographs are usually collected in print format (which may include supplementary materials in CD-

ROM). Electronic books are selectively purchased. No format is excluded if the material is relevant to the collection.

## **VI. Specific Collection Guidelines**

The collection includes materials that meet the teaching and research needs of the department. High priority is given to requests from faculty and students. The emphasis is on the collecting of current literature. See Section VII for a more detailed list of BBMB research priorities.

General textbooks and laboratory manuals with an undergraduate emphasis are not purchased. Textbooks written at the graduate level are selectively purchased based on the potential usefulness of the book to serve as a general reference or introduction to the subject.

Numerous titles are published every year in the *Methods in Molecular Biology* series. Titles are selectively purchased based on departmental research interests and needs.

Numerous titles are published every year in the *Molecular Biology Intelligence Unit* series. These books tend to have a small number of pages and can be expensive. Titles are selectively purchased based on departmental research interests.

New title notification slips that are not purchased by the BBMB bibliographer are often forwarded to the GDCB and/or Veterinary Medicine bibliographer for consideration.

## **VII. Detailed Subject Areas**

The following information was taken from the BBMB website pages that describe faculty research programs (<http://www.bbmb.iastate.edu/faculty.shtml>)

Current research areas of interest of BBMB faculty include:

- Structure-function relationships of plant proteins
- Protein-protein interactions in plant signal transduction
- Protein engineering
- Biophysical and biochemical studies of protein-RNA interactions
- Mechanisms of signal transduction
- Raf family of serine-threonine kinases (*Drosophila*)
- Macromolecular structure and recognition
- Cholesterol homeostasis in animals and humans
- Genetics and biochemistry of vitamin B12
- Enzyme chemistry
- Developmental and molecular genetics of *Drosophila* pattern formation
- Heme protein structure and function
- Crystallization of proteins and x-ray crystallography
- Regulation of embryonic skeletal muscle growth and differentiation
- Molecular mechanisms of starch biogenesis in higher plants

- Theoretical studies on the structures of proteins, nucleic acids, and small molecules
- Regulation of nuclear organization and function (*Drosophila*)
- Prediction of protein structure, function and dynamics
- Gene expression and metabolic changes during plant defense responses to pests
- Molecular biology of plant viruses
- Molecular mechanisms of starch assembly and disassembly
- Regulation of plant lipid metabolism
- Regulation of gene expression by growth factors in animal cells
- Imaging of gene expression in vivo
- Applications of aptamers to medical technology
- Plant natural products (terpenoid) biosynthesis (rice)
- Muscle biochemistry
- Carbohydrate chemistry and enzymology
- Structure and function of selected membrane proteins
- Role and establishment of histone modifications
- Chromatin structure
- Structures and mechanisms of multidrug transporters

### VIII. Other Resources Available

Major electronic indexes relevant to BBMB include: *Biosis Previews*, *Biological and Agricultural Index*, *CAB Abstracts*, *PubMed*, *SciFinder Scholar*, *Web of Science*, and *Zoological Record*.

Other useful resources include: *Current Protocols in Protein Science*, *Current Protocols in Molecular Biology*, *Springer Handbook of Enzymes*, and *Methods in Enzymology*.

#### BBMB Information

- BBMB website, <http://www.bbmb.iastate.edu/>
- College of Liberal Arts and Sciences, October 2007 Report to the President and Provost (<http://www.las.iastate.edu/main/report.shtml>). This report includes BBMBs annual report.
- Undergraduate Genetics program, <http://www.public.iastate.edu/~ugradgen/>

### IX. Cross-references to Collection Development Policies

Agronomy  
 Animal Science  
 Ecology, Evolution and Organismal Biology  
 Food Science and Human Nutrition  
 Genetics, Development and Cell Biology  
 Horticulture  
 Microbiology  
 Plant Pathology  
 Veterinary Medicine

**X. Creation date:**

Policy written on 9/28/1999 by Lorrie (Knox) Pellack

**XI. Revision History**

Extensively revised in December 2007 by Andrea L. Dinkelman

**XII. LC Class(es), if applicable.**

QD 415 – QD 441 Biochemistry - Chemical aspects of biological materials.

QH 324.3 – QH 324.4 Methods of research. Tracers.

QH 345 General biochemistry of plants and animals

QH 501-506 Life - Biomagnetism. Biophysics. Molecular biology.

QH 508 – QH 517 Life – Biological control systems. Biological transport. Bioelectronics.

Bioenergetics. Bioacoustics. Growth. Biomineralization. Biomechanics. Fluid Dynamics.

Electrophysiology.

QP 501 – QP 801 Animal biochemistry

**XIII. Bibliographer name:**

Heather Lewin

*Last revised 12/17/07*