

Collection Policy: NEUROBIOLOGY AND BEHAVIOR

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1.0 TEACHING, RESEARCH AND EXTENSION PROGRAMS

1.1 *Mission and emphases of the department*

Neurobiology and Behavior, one of seven sections in the Division of Biological Sciences, is organized "vertically," encompassing everything from molecular neurobiology to ethology and sociobiology. Its particular strengths are in Sociobiology, Neuroethology, Sensory-motor Physiology, and Molecular and Cellular Neurobiology.

1.2 *Faculty research*

20 Faculty, 9 Research Associates

Research areas:

- Chemical ecology
- Chemical defenses of insects
- Insect, avian and mammalian sociobiology
- Animal orientation
- Sensory physiology, especially audition, vision, and taste in animals and humans
- Neurological control of motor output in animals
- Electrophysiology and neuroethology, especially of fishes and insects
- Molecular genetics and developmental neuroanatomy of insects (kept at ENT)
- Molecular and cellular biology especially of synapses, membrane receptors and ion channels
- Neural circuit analysis of motor output, especially in crustaceans
- Autonomic nervous system
- Animal communication, especially acoustic
- Genetic engineering as related to animal behavior
- Genetic relatedness as related to animal behavior.

1.3 *Graduate program*

37 graduate students

The research interests of the graduate students largely reflect those of the faculty (see 1.2 above).

1.4 *Undergraduate program*

161 Majors

Career interests: professional careers in veterinary and human medicine, and research.

1.5 *Extension activity*

None

1.6 *Noteworthy facilities (e.g. unique classrooms, laboratories, farms, etc.)*

Lab of Ornithology and associated sound analysis laboratories.

2.0 SUBJECT DESCRIPTION AND GUIDELINES

2.1 *Subject definition*

Neurobiology and Behavior covers that portion of the biological sciences which is concerned with the nervous system, and the behavior that it causes.

2.2 *Subject scope*

The subject areas covered by the Neurobiology and Behavior program at Cornell may be divided roughly into three categories: Behavior, Integrative Neurobiology, and Cellular/Molecular Neurobiology. Mann Library collects materials in the following areas of these categories.

2.2.1 *Behavior*

Sociobiology

Behavioral ecology, including adaptation, spacing systems, mating systems, inbreeding and outbreeding, mate choice, conflict and cooperation.

Hormones and behavior

Sexual physiology and behavior, parental behavior, aggression, stress, learning and memory, homeostasis and biological rhythms. The role of steroids in the brain.

Biopsychology of learning and memory

Includes invertebrate "simple system" approaches, imprinting, avian song learning, hippocampal and cerebellar function and human pathology. Cognitive aspects of learning and memory are collected by Olin Library.

Behavioral Evolution

Population genetics related to behavior. Such behaviors as foraging, sexual selection, sex ratio evolution, and animal communication. The evolution of deceit, honesty and altruism.

2.2.2 Integrative Neurobiology.

Sensory systems

The visual system, including optics of eyes, retinal neurophysiology, structure and function of higher visual centers, color vision and ocular development. Auditory systems, including the physical properties of sound, the physiological mechanisms of sound production and hearing, the localization of objects in space by sound. Somesthetic systems, including thermoreception. Internal chemoreceptors and electroreception.

Effects of Aging on Sensory and Perceptual Systems

Emphasis is on effects in humans, including current developments in human sensory prosthetic devices and in regeneration of receptor structures.

Neuroethology

The explanation of behavior in terms of neural systems. Behaviors include animal orientation, acoustic communication in insects and vertebrates, chemical communication in insects, echolocation in bats and sound localization in owls, electroreception and electrolocation, visual processing, decision-making, initiating action and coordinating fixed acts.

Vertebrate neuroanatomy

Brain organization and co-evolution of vertebrate brain and behavior.

2.2.3 Cellular/Molecular Neurobiology

Neurochemistry and molecular neurobiology

Mechanisms of neurotransmitters and neuromodulators. The function and mechanisms of membrane ion channels.

Neurodiseases -- molecular aspects

Biological mechanisms of such diseases as Alzheimer's, Huntington's, color blindness, affective disorders, myasthenia gravis, disorders affecting ion channels, and muscular dystrophies. Genetic predisposition for these diseases and the use of recombinant DNA techniques for their study.

Neurogenetics

Includes both invertebrate and vertebrate systems, with emphasis on fruit fly and mouse.

Neurophysiology

Neural systems, electrical properties of nerve cells, synaptic mechanisms, and motor systems. Includes neuronal properties such as resting potential, electrical and chemical synaptic transmission, ionic currents and functional expression of foreign membrane proteins in *Xenopus* oocytes.

Developmental neurobiology

Emphasis is on cellular and molecular issues. Includes the role of cues such as hormones and developmental genes.

2.2.4 Miscellaneous topics

The parameters of the collection include, in addition to subjects previously described:

- Physiological psychology (e.g., eating and satiety, animal intelligence)
- Left and right brain/handedness
- Effects of external substances (e.g., drugs or alcohol) on brain/nervous system
- Consciousness (biological bases only; cognitive aspects are collected by Olin)
- Neural networks where existing biological systems (e.g., real neurons) are involved
- Psychopharmacology

The parameters of the collection do not include

- Therapy of neurobiological diseases, unless an endowment is established for this purpose
- Popular works

2.3 Emerging trends in the subject area

Neurophysiological techniques, including but not limited to imaging techniques, especially calcium imaging, electrophysiological techniques, and techniques of molecular biology, especially of histological application and molecular genetics (sequencing, DNA fingerprinting). Imaging publications related to clinical usage will not be purchased, except by special request.

3.0 SPECIAL INFORMATION NEEDS AND RESOURCES

3.1 Special information needs of those working in this subject area.

Gene sequence databases not available over the Internet.

3.2 Special collections or noteworthy resources in the field

- Entomology Library and Specimen Collections
- Laboratory of Ornithology
- LaserGene database for genetic sequence analysis (available through Biotechnology Program)
- BIOSIS database on Mann Library Gateway

3.3 Endowment funds or special funding arrangements

- Mann Endowment -- general biology
- Sherman -- biology, especially microbiology
- Wright -- zoology
- Biomedical -- biomedical
- Comstock -- entomology

4.0 TYPES OF MATERIALS

4.1 Priorities for types of materials

See [Priorities Table](#) for a detailed description.

- The priorities of the collection are maintaining scholarly journal acquisitions and access to bibliographic databases, such as BIOSIS.
- Annual reviews and multi-authored monographs are essential to the behaviorists in the division, as they are often interested in comparing research across diverse species. These are less important to cellular and molecular biologists and integrative neurobiologists, where subject focus is narrower and the time lag for journal article publication is less.
- Numeric/statistical files relating to molecular genetics are crucial to cellular and molecular neurobiologists.
- Major scholarly monographs and upper division and graduate textbooks are very important to behaviorists, but less important to other neurobiologists. Also very important to behaviorists are proceedings of international congresses and symposia. The most important organizations in this regard are the International Union for the Study of Social Insects (IUSSI), the Animal Behavior Society, the Behavioral Ecology Society, and ornithological groups.
- Applications programs are very important to cellular and molecular neurobiologists.

4.2 Format

All of these formats are of potential interest: microcomputer diskettes are used in physiology as are CD Roms and magnetic tapes. Mann Library does not collect films and video tapes, although they are widely used in teaching behavior.

4.3 Geographical guidelines

Our faculty conducts research in Africa, Central and South America, China, Australia, and Japan.

4.4 Language guidelines

In English, as intensively as the budget will allow. Most current literature is published in English. In the field of behavior, German, French and Russian may also be important. Japanese literature is important in the area of molecular and cellular neuroscience, but it is usually published in English. Most old anatomical literature has been published in German, French, Italian, Spanish and Russian, in about that order.

4.5 Chronological guidelines

Current.

Older literature of biology, especially anatomy and systematics, as funds permit.

5.0 OTHER RELATED LIBRARY COLLECTIONS

- Veterinary Medicine -- animal physiology
- Olin Library -- psychology, history of science
- Physical Sciences Library -- biophysics
- Engineering -- bioengineering, modeling of theoretical systems
- Entomology -- insect physiology and behavior
- Mathematics -- theoretical neuroscience

6.0 POLICY QUESTIONS, COLLECTION NEEDS, FUNDING PROBLEMS OR OPPORTUNITIES

The department receives funding from NIH and NIMH for the purpose of investigating neurological disorders and diseases. Some of the supporting material is clinical in nature, and would not normally be in the collection scope of Mann Library. An endowment is needed to support this area.

7.0 PRINCIPAL LC CLASSES

QL 921-939
 QM 451-471
 QM 575
 QP 351-495
 QP 113.4

8.0 RELATED COLLECTION POLICIES

- Physiology and anatomy
- Ornithology
- [Entomology](#)
- [Biochemistry](#)
- [Ecology and Systematics](#)

Priorities Table for Neurobiology and Behavior

Code	IMPORTANCE/INTENSITY CODES DEFINITIONS
NA	Not applicable to the discipline.
0	Ephemeral; of insufficient value to be provided by library.
1	Of short term interest, but with little or no enduring value; very selectively acquired; retained, uncataloged, for limited duration only, e.g. newsletters in newly emerging, poorly documented areas, and manuals or pamphlets for reserve reading.
2	Limited scholarly interest or utility; collected very selectively, but not of high priority.
3	Important for research and/or instruction; should be well represented, but collected selectively rather than intensively.
4	Very important for faculty and/or students; intensively collected, i.e. every effort is made to provide as deep coverage of this literature as possible.
5	Essential to work in the discipline; the most important type of material for research or instruction purposes. Ensuring the highest possible coverage should be the library's top priority in this discipline.

Importance/Intensity Code			SERIALS
Integrative	Behavior	Cellular/Molecular	
5	5	5	Journals, scholarly
4	4	4	Journals, technical
NA	NA	NA	Journals, other (describe)

4	5	4	Annual reviews, advances in...
3	3	3	Scientific and technical reports and research bulletins of major academies, learned societies, professional research and educational organizations and government agencies
3	4	3	Proceedings, of international congresses and symposia
3	3	2	Proceedings, national or local
NA	NA	NA	Statistical series
NA	NA	NA	Trade journals and periodicals
NA	NA	NA	Popular periodicals, hobby
NA	NA	NA	Popular periodicals, semi-technical
NA	NA	NA	Popular periodicals, farm press
NA	NA	NA	Newsletters/newspapers
NA	NA	NA	Proceedings of legislative bodies
NA	NA	NA	Student publications
NA	NA	NA	Administrative publications of major academies, learned societies, professional, research and educational organizations and government agencies
NA	NA	NA	Corporate annual reports
NA	NA	NA	Yearbooks
-	-	-	Press releases
-	-	-	Lists
NA	NA	NA	Working papers
Integrative	Behavior	Cellular/Molecular	MONOGRAPHS
3	4	3	Major scholarly monographs
2	2	3	Professional and technical
3	3	2	Subject histories
3	4	3	Textbooks, upper division, graduate
NA	1	NA	Biographies
NA	1	NA	Popular monographs
NA	1	NA	Technical reports
NA	1	NA	Government reports
NA	1	NA	Proceedings, international
NA	1	NA	Proceedings, other
2	2	2	Theses and dissertations (outside CU)

2	2	2	Festschrift
NA	NA	NA	Patents
NA	NA	NA	Corporate histories
NA	NA	NA	How-to books & lab manuals
NA	NA	NA	Pamphlets
NA	NA	NA	Ephemera (describe)
NA	NA	NA	Maps
NA	2	NA	Technical bulletins/handbooks/compendia
Integrative	Behavior	Cellular/Molecular	ELECTRONIC INFORMATION
3	3	4	Applications programs
5	5	5	Bibliographic databases
2	2	3	Bulletin boards
2	2	2	Fulltext files
NA	NA	NA	Geographic information systems
NA	NA	5	Numeric/statistical files
-	-	-	Other (describe, taking as much space a necessary)

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