

Collection Policy: TOXICOLOGY

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1.0 TEACHING, RESEARCH AND EXTENSION PROGRAMS

[Excerpt from The Institute for Comparative and Environmental Toxicology \(ICET\)](#)

1.1 Mission and emphases of the department

The Environmental Toxicology program is a broadly based inter-college program facilitated by the Institute for Comparative and Environmental Toxicology (ICET). ICET serves as a focal point for all research, teaching, and cooperative extension activities in the broad interdisciplinary area of environmental toxicology and encourages the development of collaborative programs between faculty members in many university departments. The mission of ICET is to provide:

- Comprehensive professional and graduate education in comparative and environmental toxicology within an interdisciplinary, campus-wide context via three NIEHS-sponsored training grants and a major NIEHS/USEPA program grant.
- Research in a wide range of areas including microbial degradation of wastes, cancer and other genotoxic mechanisms, pathology, molecular biology, pollutant fate and transport, food safety & nutrition, analytical toxicology, ecotoxicology & environmental chemistry, developmental toxicology, immunotoxicology, environmental engineering, and risk communication and analysis; and
- Support of outreach and extension about pesticides, hazardous wastes, animal health, ground-water protection, and risk assessment, management and communication, including a major program in environmental factors in breast cancer.

Historically Cornell has had a seminal role in the field nationally and internationally, especially regarding pesticides, metabolism and degradation studies, groundwater protection and residue analysis. The Institute for Comparative and Environmental Toxicology (ICET), part of the Center for the Environment, was founded in 1981 as an umbrella for a variety of efforts originating in several departments in the 1960s.

1.2 Faculty research

ICET has 38 faculty members spanning 22 academic departments in five Cornell colleges. Faculty expertise covers areas such as nutritional toxicology and food safety, bioremediation and environmental engineering, and many areas of biomedical toxicology. The organizational structure of ICET supports the Cornell Superfund Basic Research and Education Grant and a National Institute for Environmental Health Sciences (NIEHS) Training Grant.

1.3 Graduate program

About 27 graduate students are working (1998-99) on M.S. and Ph.D. degrees, with a similar number from other fields minoring in environmental toxicology. Graduates work in academia, government agencies, research institutions, industry, and commerce. A total of 20 MSs, 38 PhDs, and 16 MS/PhDs have been earned since the creation of the graduate field of Environmental Toxicology in 1980. They have organized an Association for Comparative Environmental Toxicology Student (ACETS).

1.4 Undergraduate program

An Environmental Science major is being developed for undergraduates. This program will be run administratively through the Center of the Environment. It will draw students from other CALS departments. A survey class, TOX/BIOSCI/VetMbImm 320, is being taught to about 20 jr-sr students. About 12-25 undergrads take TOX/NTRES 406 (Ecological Risk Assessment) every other year, alternating w/ TOX/NTRES 607 (Ecotoxicology), which rarely has much more than 2-5 undergrads. The same is true for TROX/NTRES 610 (Introductory Chemical and Environmental Toxicology) in ea. Fall. In addition some undergrads take Jeff Scott. s TOX/ENTOM 370 (Pesticide Chemistry).

1.5 Extension activity

The Cornell University Program on Breast Cancer and Environmental Risk Factors in New York State (BCERF) is Toxicology's main extension program, however it is an independently funded program that receives money from the USDA and NY state. Toxicology wants to increase its extension efforts, and would like to have a senior extension agent in Cooperative Extension who specializes in toxicology. Current topics of interest include the mosquito as a disease vector in NY City, and breast cancer on Long Island. Past efforts have included the ExToxNet (on-line) and continued inter-institutional cooperation with OR State, WA State, UC-Davis, & Mich. State. We provide tech. support to a wide range of groundwater and drinking water issues, hazardous waste management, zoning and siting, and risk-based training of pestic. applicators and county agents

1.6 Noteworthy facilities

NTRES, Nutri Sci, SCAS, and Bailey Hortorium

2.0 SUBJECT DESCRIPTION AND GUIDELINES

The graduate program in environmental toxicology stresses a broad interdisciplinary education based on strong discipline-based skills, amplified by specific areas of competence acquired through course work and research in one of three major areas of concentration:

- cellular and molecular toxicology
- food and nutritional toxicology
- ecotoxicology and environmental chemistry

2.1 Cellular and Molecular Toxicology

Research in cellular and molecular toxicology at Cornell is primarily concerned with the mechanisms by which chemicals affect biological systems and act to induce changes in organs and cellular components of organisms. Students concentrating in this area may choose projects which will provide opportunities to:

- Use in vivo or in vitro model systems to evaluate toxicity;
- Study the effects of environmental chemicals and potential therapeutic agents on molecular mechanisms controlling cell proliferation and differentiation;
- Investigate cellular and molecular mechanisms of target-organ toxicity;
- Study mechanisms (including metabolism) by which organisms develop resistance to pesticides and drugs;
- Investigate factors modulating chemically induced toxicity and/or carcinogenicity.

Courses taken by students in this concentration typically include biochemistry and molecular biology, cell biology, statistics, resource economics, environmental law and policy. These may be followed by advanced courses in areas such as developmental biology, neurobiology, genetics, cytogenetics, mutagenesis, carcinogenesis, signal transduction or pharmacology.

2.2 Food and Nutritional Toxicology

There few faculty (and currently no graduate students) in Toxicology working on Food and Nutrition issues. This work is presently being done within the department of Nutrition.

Research in Nutritional Toxicology at Cornell falls broadly in two categories: the biological effects of naturally occurring toxicants or potentially toxic substances added to food and the influence of nutritional status on the responses of organisms exposed to toxic substances. Students choosing nutritional toxicology as a concentration will find research projects that provide them opportunities to:

- Work with animal models to evaluate:
 1. toxic potentials of naturally occurring, or intentionally added non-nutrient substances in foods;
 2. influence of diet or nutritional status on carcinogenesis or the response to specific toxicants;
 3. influence of diet on behavioral consequences of toxic exposure in utero and during early development;
- Work with human subjects to determine the influence of specific nutrients on metabolic responses to toxic substances at levels similar to those encountered in every day life;
- Use of in vitro and cell culture techniques to ascertain mechanisms by which toxic substances interact with specific nutrients or

their metabolites.

Students concentrating in nutritional toxicology typically supplement the core courses in environmental toxicology with courses or seminars in nutrition, food science, biochemistry and molecular biology, cell biology and statistics. Advanced courses include specialized courses on macro and micronutrients, nutrition and behavior and nutritional epidemiology. Among the active research areas are safety in processing and packaging, pesticides, microbial contamination and nitrosamine formation. The toxicity of high doses of trace minerals is also studied.

2.3 Ecotoxicology and Environmental Chemistry

This concentration is focused on the identification, detection and fate of chemicals in the environment and biota, and their effects on natural ecosystems and processes. Active research projects in this concentration offer students the opportunity to investigate the following:

- Development of analytical methods for residue analysis and measurement of chemicals in soil, air, water, plant and animal tissues from field locations;
- Use of natural and model systems to study the fates of environmental contaminants in air, soil, water and food webs;
- Study of biotic and abiotic degradation, including biological and chemical remediation;
- Investigation of atmospheric pollutants on physiological and metabolic processes of plants and animals;
- Study of plants as accumulators and vectors of toxic substances;
- Investigation of chronic effects of water-borne contaminants on aquatic organisms.

Courses taken by students in this concentration are wide ranging. They include: ecology & ecological risk assessment incl. non-chemical stressors and biotech agents; soils, microbiology; global climate change, environmental engineering; adv. statistics, resource policy and economics, law and CRP; development sociology, communications and others.

2.4 Other topics

- Risk communication and public policy development

2.2.7 Exclusions

- Medical toxicology
- Forensic toxicology
- Occupational. health and safety
- Cosmetics
- Little or no work with animals, aquatic. species & neurobiology

2.3 Emerging trends in the subject area

- Endocrine disruption (i.e. toxins that affect development or reproduction)
- Bioremediation
- Genetic predisposition to toxins
- Behavioral teratology and development, and behavioral toxicology in general

3.0 SPECIAL INFORMATION NEEDS AND RESOURCES

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

- DNA sequencing data
- Grey Literature (departmental reports and publications that do not make it to books or journals)

3.2 Special collections or noteworthy resources in the field

- Toxline
- Medline
- EPA reports

- Extoxnet
- NTIS
- Toxic Release Inventory data

3.3 Endowment funds or special funding arrangements

Bayern Fund (biomedical)
 Dukart Fund (environmental science)
 Ford Book Fund (environmental ethics)
 Mann Fund (general biology)
 McCay Fund (biochemistry)
 Sarna Fund (genetics)
 Sherman Fund (biology)

4.0 TYPES OF MATERIALS

4.1 Priorities for types of materials

See [Priorities Table](#).

4.2 Format

Mostly journals, and books that overview issues and historical problems of toxicology. Try to avoid most conferences.

4.3 Geographical guidelines

Focus on North America and Europe (including Eastern), and industrialized Asian countries (like Japan). There are currently no faculty working on (or in) developing countries.

4.4 Language guidelines

Focus on English. Graduate students no longer have a foreign language requirement.

4.5 Chronological guidelines

Current, plus historical treatments of environmental problems.

5.0 OTHER RELATED LIBRARY COLLECTIONS

Engineering Library

Movement of toxins through soil, general hydrology; Remediation; EPA repository

Cornell Medical College Library

Medical collection including oncology, tumors, mutagens and mutagenesis, carcinogenesis, teratogenesis, pharmacology.

Geneva Experiment Station Library

Food additives and toxicology; pesticides, herbicides and fungicides

Physical Sciences Library

Biochemistry; environmental and analytical chemistry

Veterinary Library

Veterinary oncology, pharmacology, histology

Entomology Library
 Pesticide labels; specialized and historical collections

6.0 POLICY QUESTIONS, COLLECTION NEEDS, FUNDING PROBLEMS OR OPPORTUNITIES

7.0 PRINCIPAL LC CLASSES

Environmental Quality GE 140 - GE 160
 Pollution-- Physiological Effect QP 82.2.P6
 Environmental Health RA 565 - RA 600
 Toxicology RA 1190 - RA 1270
 Toxicology -- Animal Models RA 119.4.A54
 Toxicological Chemistry RA 1219.3 - RA 1220.3
 Developmental Toxicology RA 1224.45
 Environmental Toxicology RA 1226
 Environmentally Induced Diseases RB 152.5 - RB 152.6
 Breast -- Cancer RC 280. B8
 Pollution TD172 - TD 193.5

Communication in the environmental sciences

8.0 RELATED COLLECTION POLICIES

- Agricultural and Biological Engineering
- Agronomy--GIS
- Animal Science
- Biochemistry, Molecular and Cell Biology
- Biometrics
- Communication
- Ecology and Systematics
- Entomology
- Food Science
- Health Administration
- Neurobiology and Behavior
- Nutritional Sciences
- Microbiology
- Physiology
- Plant Biology
- Natural Resources
- Soil Crop and Atmospheric Sciences

Priorities Table for Toxicology

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.

Code	SERIALS	Notes
-	Journals, scholarly	-
-	Journals, technical	-
-	Journals, other (describe)	-
-	Annual reviews, advances in...	-
-	Scientific and technical reports and research bulletins of major academies, learned societies, professional research and educational organizations and government agencies	-
-	Proceedings, of international congresses and symposia	-
-	Proceedings, national or local	-
-	Statistical series	-
-	Trade journals and periodicals	-
-	Popular periodicals, hobby	-
-	Popular periodicals, semi-technical	-
-	Popular periodicals, farm press	-
-	Newsletters/newspapers	-
-	Proceedings of legislative bodies	-
-	Student publications	-

-	Administrative publications of major academies, learned societies, professional, research and educational organizations and government agencies	-
-	Corporate annual reports	-
-	Yearbooks	-
-	Press releases	-
-	Lists	-
-	Working papers	-
Code	MONOGRAPHS	Notes
-	Major scholarly monographs	-
-	Professional and technical	-
-	Subject histories	-
-	Textbooks, upper division, graduate	-
-	Biographies	-
-	Popular monographs	-
-	Technical reports	-
-	Government reports	-
-	Proceedings, international	-
-	Proceedings, other	-
-	Theses and dissertations (outside CU)	-
-	Festschrift	-
-	Patents	-
-	Corporate histories	-
-	How-to books & lab manuals	-

-	Pamphlets	-
-	Ephemera (describe)	-
-	Maps	-
-	Technical bulletins/handbooks/compendia	-
Code	ELECTRONIC INFORMATION	Notes
-	Applications programs	-
-	Bibliographic databases	-
-	Bulletin boards	-
-	Fulltext files	-
-	Geographic information systems	-
-	Numeric/statistical files	-
-	Other (describe, taking as much space a necessary)	-