Register Now for Summer Biotechnology Workshops

Registrations are now being accepted for the 1998 summer biotechnology education workshops to be held on the Iowa State University campus. If you would like to take advantage of these great training opportunities, read the workshop descriptions that follow and select the workshop(s) of your choice.
To register for one or more workshops, please contact Lori Miller at the ISU Office of Biotechnology, telephone: (515) 294-9818 or toll-free in Iowa 1-800-643-9504, e-mail: lorimill@iastate.edu. Please register early to guarantee a place in the workshop(s) of your choice. Class size is limited to 20 per workshop. The registration deadline for all workshops is June 5, 1998. We hope to see you at ISU this summer.

**Biotechnology Education Workshop I for Science Teachers**
June 15-19, 1998
2 staff development credits - $20 and/or
1-2 graduate credits - $176 per credit
$140 stipend available

This workshop course is directed at science teachers who wish to gain a basic knowledge of biotechnology. Teachers will learn how to prepare and instruct the laboratories in DNA extraction from bacteria, kiwi, or onion; DNA transformation; and DNA fingerprinting. Teachers will perform the lab protocols as the students would do in class. Field experiences and guest speakers will enhance the workshop's instruction. This workshop will benefit new teachers, as well as serve as a refresher course for teachers who have attended a biotechnology workshop in the past.

**Biotechnology Education Workshop for Agriculture Education Instructors**
June 23-25, 1998
1 staff development credit -$20 and/or
1-2 graduate credits - $176 per credit

This course is a workshop focused on the basics of biotechnology and how it can be applied to agriculture. The basic technical knowledge and skills in this workshop will be useful in helping agricultural educators better understand biotechnology and how it will affect their curriculum and profession. Laboratory investigations and instruction will give educators experience with chymosin, Bt corn, bovine somatotropin, and more. Field experiences and guest speakers will enhance the workshop's instruction. This workshop will benefit new teachers, as well as serve as a refresher course for teachers who have attended a biotechnology workshop in the past.

**Biotechnology Education Workshop for Family and Consumer Science Instructors**
July 7-9, 1998
This workshop course focuses on the basics of biotechnology and how it can be applied in human nutrition and health. The basic technical knowledge and skills in this workshop will be useful in helping family and consumer science educators better understand biotechnology and how it will affect their curriculum and profession. Field experiences and guest speakers will enhance the workshop's instruction. This workshop will benefit new educators, as well as serve as a refresher course for educators who have attended a biotechnology workshop in the past.

**Biotechnology Education Workshop II-An Advanced Workshop for Science, Agriculture, and Family and Consumer Science Educators**
July 13-17, 1998
2 staff development credits - $20 and/or
1-2 graduate credits - $176 per credit
$140 stipend available

This advanced workshop is open to any science, agriculture, and family and consumer science educators who have attended one of the previous biotechnology workshops. Educators will learn how to prepare and instruct advanced laboratories in biotechnology. Activities will include showing marker gene expression, DNA isolation, recombinant DNA techniques, DNA amplification, restriction analysis of DNA, and more. Teachers will perform the lab protocols that their students could do in class. Field experiences and guest speakers will enhance the workshop's instruction.

**Biotechnology School Enrichment Teacher Workshop - Grades 4-6**
July 28, 1998

This workshop is directed toward teachers for grades 4-6 who wish to have hands-on experience with the concepts covered in the Biotechnology School Enrichment Curriculum available through ISU Extension. Topics to be covered include: Cell Structure, Using Microscopes in the Classroom, What Is DNA?, DNA Extraction, and other basic biotechnology concepts.

The curriculum provides students with an experiential learning opportunity that promotes development of appropriate life skills and science and technology concepts. Curriculum books will be supplied. Supply kits for classroom use are available for check-out from an ISU Extension Biotechnology Team member.
Biotechnology School Enrichment Teacher Workshop - Grades 7-8
July 29-30, 1998
1 staff development credit - $20 and/or
1 graduate credit - $176

This workshop is directed toward science teachers for grades 7-8 who wish to have hands-on experience with the concepts covered in the Biotechnology School Enrichment Curriculum available through ISU Extension. Topics to be covered include: What Is DNA?, DNA Extraction, Use of a Micropipettor, Use of Electrophoresis, Bioethics, and other basic biotechnology concepts.

The curriculum provides students with an experiential learning opportunity that promotes development of appropriate life skills and science and technology concepts. Curriculum books will be supplied. Supply kits for classroom use are available for check-out from an ISU Extension Biotechnology Team member.

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Project BIO On-Line Courses for Summer and Fall 1998

Project BIO is a partnership for biology education that includes biology educators and students at Iowa high schools, community colleges, selected industries, and Iowa State University. As part of Project BIO's mission to develop and share biology education resources via the Internet, the following on-line courses will be offered during summer session and fall semester 1998. Teachers and high school students are invited to take these courses. To learn more about the courses, the computer equipment needed, and how to register, please visit the Project BIO homepage at http://project.bio.iastate.edu.

Project BIO is funded by ISU's Office of the Provost, College of Agriculture, College of Liberal Arts and Sciences, Botany Department, Office of Biotechnology, Zoology and Genetics Department, the Howard Hughes Program, and Vision 2020.

Summer 1998 On-Line Courses

Biol 109 - Introductory Biology. 3 credits. Life considered at cellular, organism, and population levels. Function and diversity of the living world. Presentation of basic biological principles, as well as topics and issues of current human interest. Non-majors only.
Gen 308, 508 - Biotechnology in Agriculture, Food and Human Health. 2 credits. Scientific principles and techniques of biotechnology. Biotechnology products and applications. Ethical, legal, and social issues related to biotechnology. Can be taken for undergraduate (Gen 308) or graduate (Gen 508) credit.

MIPM 302 - Introduction to Basic Microbiology. 3 credits. The characteristics of microorganisms and their roles in disease, in the environment, and in industry. Introductory course designed for majors in microbiology and other biological sciences.

MIPM 501X - Advanced Microbiology. 3 credits. Overview of microbiology and introduction to the literature. Topics include procaryote structure and function, physiology, genetics, virology, and immunology.

**Fall 1998 On-Line Courses**

Biol 201 - Principles of Biology I. 3 credits. Introduction to the nature and diversity of life, including the cellular basis of life; energy relationships; the nature of heredity; evolution; form and function of microbial, fungal, plant, and animal life; and principles of ecology. First semester of a two-semester introductory course that is required by most of the basic and applied life science departments at Iowa State University.

Biol 202 - Principles of Biology II. 3 credits. Introduction to the nature and diversity of life, including the cellular basis of life; energy relationships; the nature of heredity; evolution; form and function of microbial, fungal, plant, and animal life. Second semester of a two-semester introductory course that is required by most of the basic and applied life science departments at Iowa State University.

Biol 109 - Introductory Biology. [See description above.](#)

Zool 155 - Basic Human Physiology and Anatomy. 3 credits. The structure and functions of human organ systems. Non-majors course.

Gen 308, 508 - Biotechnology in Agriculture, Food and Human Health. [See description above.](#)

MIPM 302 - Introduction to Basic Microbiology. [See description above.](#)
Order Free Bt Laboratory Protocol and Supplies from the ISU Office of Biotech

A laboratory protocol that allows students to see first-hand how Bt corn resists European corn borers is available from the ISU Office of Biotechnology.

During the first stage of the protocol, teachers and students grow Bt corn and non-Bt corn in the lab for several weeks. When the corn reaches the appropriate growth stage, either the whole plants or leaves placed in petri dishes are infested with European corn borer egg masses. Students observe the differences in infestation rates between the Bt and non-Bt plant tissue. Students are asked to solve practical problems and issues related to the use of Bt corn.

The written laboratory protocol, seed packets of Bt and non-Bt corn, and European corn borer egg masses are available to Iowa teachers free-of-charge from the ISU Office of Biotechnology. For more information or to order the protocol and supplies, please contact Lori Miller in the Office of Biotechnology toll-free at 1-800-643-9504 or by e-mail at lorimill@iastate.edu.

Bt Display Boards Available from ISU Extension

A two-panel tabletop display that addresses the two questions "What is Bt?" and "How does Bt work?" can be borrowed from ISU extension county offices or members of the ISU Extension Biotechnology Team (see list in next story).

The display panels, each approximately 18 inches by 24 inches, were designed to slip into the wood frames already owned by ISU extension offices. The more than 100 displays distributed throughout the state were provided free by the ISU Office of Biotechnology.

Biotechnology Enrichment Curriculum for Grades 4 and 5 Will Be Introduced This Summer

The ISU Extension Biotechnology Design Team is nearing completion of the biotechnology enrichment curriculum for grades 4 and 5. The curriculum, which is being field-tested during the 1997-1998 school year, focuses on cells
and how to use microscopes.

Plans are to introduce the new curriculum to attendees of the biotechnology school enrichment teacher workshop to be held July 28 at Iowa State University. (See workshop description in the first story of this issue.)

By fall, the 4th and 5th grade curriculum should be available for check-out from local ISU county extension offices and Area Education Agencies or for purchase from ISU's Extension Distribution Center in Ames. Teachers will be able to borrow kits with microscopes from members of ISU's Extension Biotechnology Design Team.

The new curriculum was developed by Extension Biotechnology Design Team members Debbie Curry, E-SET youth initiative specialist; Sue Delaney, county extension education director; Dennis DeWitt, extension livestock field specialist; Menda Witt, southeast school enrichment coordinator; Josh Riphagen, northwest school enrichment coordinator; Mitchell Hoyer, county extension education director; Saqib Mukhtar, extension agricultural engineering field specialist; Kathie Oberman, extension youth field specialist; Earl McAlexander, extension youth field specialist; Barbara Sauser, extension youth field specialist; and David Seilstad, extension youth field specialist.

The curriculum is a joint project of ISU's Office of Biotechnology and Extension, 4-H Youth Development. Funding for the project was provided by Extension-Science, Engineering and Technology (E-SET) and the Office of Biotechnology.
demonstrations, hands-on student activities, and a bibliography of printed and audiovisual resources.

Iowa teachers are invited to contribute to the fats and oils project. For more information, a sample classroom demonstration, and a preliminary list of printed and audiovisual resources, please contact the Office of Biotechnology at the address, phone, fax, or e-mail address listed at the end of this issue.

Federal Resources Book

The Eisenhower National Clearinghouse for Mathematics and Science Education (ENC) has published the fourth edition of The Guidebook of Federal Resources for K-12 Mathematics and Science. The first section of the 1997-98 publication contains overviews and contacts for 16 federal agencies, including the U.S. Departments of Agriculture, Education, and Energy, the National Science Foundation, and the National Aeronautics and Space Administration. Mailing addresses, fax numbers, and e-mail addresses are included in many of the entries.

The second section of The Guidebook divides the country into regions and states. Federal programs and resources, including contacts, are listed for each state. Iowa's entry contains contacts for the following programs and more: State 4-H Youth Development, Ag in the Classroom, Eisenhower Professional Development Program, Midwest Consortium for Mathematics and Science Education, North Central Regional Educational Laboratory, Adventures in Supercomputing, Project WILD, Aviation Education Workshops, the President's Environmental Youth Awards Program, NASA Educator Resource Center, and the Iowa Space Grant Consortium.

Free copies of The Guidebook are available while supplies last from the Eisenhower National Clearinghouse, The Ohio State University, 1929 Kenny Road, Columbus, OH 43210-1079, phone toll-free 1-800-621-5785 or e-mail info@enc.org.

Agricultural Research Magazine

Agricultural Research is published monthly by the Agricultural Research Service of the U.S. Department of Agriculture. Usually about 23 pages long, the magazine is loaded with color photos that accompany easy-to-read articles about USDA research projects. Information in the magazine is public property
and may be reprinted without permission.

In the December issue is an article about a gene-based strategy to keep tomatoes and other plants from forming undesirable natural compounds called glycoalkaloids. Another article describes a quick and easy way to test the competence of a person's immune system by measuring the level of T-cell proliferation.

The January issue contains articles about a gene that regulates hypernodulation in soybean root systems and a another gene that may be used to fight soft rot microbes in food crops.

Complimentary one-year free subscriptions of Agricultural Research are available to schools. Send requests to Editor, Agricultural Research Magazine, Room 408, 6303 Ivy Lane, Greenbelt, MD 20770 or by e-mail to lmclaugh@asrr.ars.usda.gov. For the latest news and information from the USDA's Agricultural Research Service and for back issues of Agricultural Research Magazine, point your web browser to http://www.ars.usda.gov/is on the Internet.

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The Office of Biotechnology Homepage
http://www.biotech.iastate.edu
To find the following most recent additions to the ISU Office of Biotechnology homepage, click on the links for "Educational Resources" and then "Publications-Iowa State University."

ISU Biotechnology Update Newsletter for February

- Hy-Vac Laboratory Eggs Company of Adel, Iowa, is opening a new Biotechnology Center in Dallas Center. You can read about it in the business section.
- A new ISU plant molecular breeding short course, this summer's biotechnology education workshops, and a bioethics institute in North Carolina are articles you'll find in the educational section.
- In the dollars for research section, read about a $2.5 million request from ISU to the State of Iowa for a center of excellence in the fundamental plant sciences. Four grants recently awarded to members of ISU's biotechnology faculty also are described in this section.
- An ISU biochemist's project to better understand how communication between proteins enables cells to grow, differentiate, and multiply is one of the research projects featured in the news around ISU section.
Another ISU biochemist's studies to improve existing tests of vitamin A levels in persons with deficiency-related illnesses also is highlighted.

- The first sorghum transposon to be cloned is featured as a new technology available for licensing from ISU.

**News Releases**

Full-text versions of recent news releases issued to the media have been added at this link. These news releases describe research projects or educational efforts conducted by ISU's biotechnology faculty, including:

- a biochemist's studies to improve existing test of vitamin A levels in persons with deficiency-related illnesses
- a new low-saturated-fat soybean oil developed by a food scientist and an agronomist at ISU that is being marketed in seven Midwestern states
- research by a poultry geneticist who is isolating desirable genes from Egyptian Fayoumi chickens
- an entomologist's research on the genetics of African tsetse flies to find better ways to control the disease-carrying insects
- an agronomist's project studying the genetics of alfalfa.

**Iowa Biotech Educator for January**

If you lost track of your January issue, you will find a text version here. Article topics include the summer 1998 biotechnology education workshops; how to get answers to your biotech questions; biotechnology school enrichment curriculums for grades 5-6 and 7-8; brief reviews of six biotechnology-related Internet sites; a report on biotechnology presentations at the fall conference of the Iowa Science Teachers' Section of the Iowa Academy of Science; a grant program sponsored by GTE; a national survey by the DNA Learning Center at the Cold Spring Harbor Laboratory; an RNA curriculum project by the Biological Sciences Curriculum Study (BSCS); and low-cost educational resources from the Human Genome Project, the Eisenhower National Clearinghouse, and the American Association for the Advancement of Science.

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**Blazing a Genetic Trail**

http://www.hhmi.org/genetictrail

*Blazing a Genetic Trail*, an on-line publication from the Howard Hughes Medical Institute, describes how families and scientists are combining forces to seek flawed genes that cause disease. The heavily illustrated publication contains chapters about stalking the lethal cystic fibrosis gene, studying large families whose members are afflicted by disease, the Human Genome Project, why DNA has so many errors, how genetic disorders are inherited, how genetic diseases are conquered, the contribution of mouse mutants, a brief key to basic genetics, and a glossary.
Agricultural Biotechnology Web Sites

http://www.nbiap.vt.edu
The January 1998 issue of Information Systems for Biotechnology (ISB) News Report contains an annotated list of links to agricultural biotechnology sites maintained by national and international organizations, governments, universities, public interest groups, and commercial organizations. The January issue of ISB Reports can be accessed through the web site of the National Biological Impact Assessment Program (NBIAP) whose URL is given at the beginning of this article. NBIAP is a program of the U.S. Department of Agriculture.

PBS Online

http://www.pbs.org
The web site of the Public Broadcasting System has a wealth of information for science teachers. For example, near the bottom of the main homepage is a drop-down menu titled "PBS Online Web Sites: Scroll-n-Click." Click on the menu box and the web sites for a number of PBS television series appear. Select one and click the "Take Me There" box.

Selecting the "Innovation" series site takes you to three programs that originally premiered in December 1997. The program sites are full of animations and information about biotechnology-related developments such as a gene therapy, tissue engineering, cloning, and the future of genetic technology. A Shockwave plug-in, available free on the site, is needed to view the animations.

Also on the main homepage is a "Learn with PBS" link that connects with a variety of classroom resources for K-12 teachers. Under the "Scienceline" and "About Scienceline" links is a schedule of PBS science-related programs that are copyright cleared for classroom use.

Health A to Z

http://www.healthatoz.com
Health A to Z is a medical search engine. Categories include Alternative Medicine, Basic Medical Sciences, Consumer Health and Information, Pharmaceuticals and Drugs, Veterinary Medicine, and many more. Selecting
the category Basic Medical Sciences brings up more choices in immunology, genetics, molecular biology, biochemistry, virology, and others.

If students are interested in biotechnology's impact on medicine, this site should be very helpful.

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**Toshiba America Foundation**

The Toshiba America Foundation offers a grant program for projects to improve science-related education in grades 7-12. Grants are awarded at two levels, under $5,000 and more than $5,000. The Foundation's annual grants budget is about $500,000.

Projects must be planned and led by classroom teachers. Educators should not attempt to create new programs, materials, techniques, or curricula, but should focus on implementing and/or adapting existing ones to meet local classroom needs.

Biotechnology-related projects have been funded in the past. A list of the Foundation's most recent grants is available on the Internet at [http://www.toshiba.com](http://www.toshiba.com).

Proposals for grants of $5,000 or less are accepted throughout the year. Funding decisions are made monthly, except for March and September. For larger grants of $5,000 or more, proposals are funded twice a year, in March and September. Proposals for larger grants must be submitted by the first working day in February for the March round and by the first working day in August for the September round.

For information about the proposal process, please contact the Program Office, Toshiba America Foundation, 126 East 56th Street, New York, NY 10022, phone 212-588-0820, fax 212-588-0824, or e-mail foundation@tai.toshiba.com.

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**ISU Is Your Biotech Connection**

**For General Information or Free Lab Supplies for Iowa Educators:**
Contact: Lori Miller, Office of Biotechnology
Phone: Toll-free in Iowa 1-800-643-9504 from 8:00 a.m. to 5:00 p.m.
weekdays, excluding university holidays
FAX: 515-294-4629
E-mail: biotech@iastate.edu

For Educational Resources:
Internet homepage: http://www.biotech.iastate.edu

For Expert Answers to Biotech Questions:
Contact: Dr. Gary Polking, Manager of the DNA Facility
Phone: Toll-free 1-800-643-9504
E-mail: polking@iastate.edu

Contact: Mike Zeller, Visiting Master Teacher in Biotechnology
E-mail: mzeller@hawk.woodward-granger.k12.ia.us

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Subscription Information
One copy of Iowa Biotech Educator is mailed to each Iowa school. Iowa teachers and extension educators can receive free individual subscriptions by contacting Lori Miller at the Office of Biotechnology, 1210 Molecular Biology Building, Iowa State University, Ames, IA 50011-3260, ph. 515-294-9818, fax 515-294-4629, or by e-mailing her at lorimill@iastate.edu.


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We'd Like to Hear From You!

- Do you have a tip for other teachers about a biotech laboratory protocol or other activity?
- Are you using a textbook, video, or other classroom resource that you think other teachers should know about?
- Have you discovered a useful biotechnology site on the Internet?

Please send us an e-mail (biotech@iastate.edu) or make a free call in Iowa (1-800-643-9504), and we'll share it in the Iowa Biotech Educator.
About the ISU Public Education Program in Biotechnology...

The Public Education Program in Biotechnology is supported by the Iowa Soybean Promotion Board; Pioneer Hi-Bred International, Inc.; the Roy J. Carver Charitable Trust; West Central Cooperative; and the Iowa Farm Bureau Agricultural Leadership and Promotion Foundation.

To Contact the Program

Phone: 515-294-9818 or, toll-free in Iowa, 1-800-643-9504
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