Registration Opens for Summer 2004
Biotechnology Education Workshops

Educators in public or private schools or those who work with youth in 4-H or other community programs are invited to attend one or more of the biotechnology workshops offered at Iowa State University this summer.

The workshops will be held in the laboratories of the Biotechnology Outreach Education Center (BOEC) on the Iowa State campus in Ames. Iowa teachers can receive stipends of $50 per day to help cover their costs of attending. ISU Extension educators/personnel can receive travel reimbursements of up to $50 per day to help cover their expenses. Staff development or graduate credits will be offered for each workshop.

Upon completion of any of the workshops, Iowa teachers are eligible to receive free supplies and equipment for any of the 22 lab protocols available from ISU.

Materials and stipends for the workshops are funded through a grant from the U.S. Department of Agriculture, by the ISU Office of Biotechnology, and by the Iowa Biotechnology Association that is a stakeholder participant in the USDA grant.

The $3.7 million USDA grant was awarded to a consortium of nine land-grant institutions in Minnesota, North Dakota, South Dakota, Wisconsin, and Iowa through the USDA’s Initiative for Future Agriculture and Food Systems. The consortium is addressing economic, ethical, and social aspects of agricultural biotechnology. Each of the summer workshops will feature a bioethics component, and the June 23-25 workshop will be devoted entirely to bioethics.

For more information about the Biotechnology Education workshops, please contact Lori Miller at 515-294-9818, toll-free in Iowa at 800-643-9504, or e-mail her at lorimill@iastate.edu. To register, contact Lori or complete the form on p. 7 and mail or fax it by May 28 to the address at the bottom of the form.

June 7-11, 2004
Biotechnology Education Workshop I for Science Educators
Iowa State University, Ames, Iowa
2 staff development credits - $20 and/or 1-2 ISU graduate credits - $305 per credit $200 stipend available for Iowa schoolteachers ($50 per day)
Travel reimbursement available for ISU Extension educators/personnel (up to $50 per day)

This workshop course is directed at teachers who want to gain a basic knowledge of biotechnology. Teachers will learn how to prepare and instruct the laboratories in DNA extraction and quantification from various sources, DNA transformation, DNA fingerprinting, bioinformatics, and more. Educators will prepare and perform the lab protocols as the students would do in class. Techniques for encouraging classroom bioethics discussions will be featured.

June 15-17, 2004
Biotechnology Education Workshop I for Family and Consumer Sciences Educators
Iowa State University, Ames, Iowa
1 staff development credit - $20 and/or 1 ISU graduate credit - $305 $150 stipend available for Iowa schoolteachers ($50 per day)
Travel reimbursement available for ISU Extension educators/personnel (up to $50 per day)

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Information and Free Lab Supplies for Iowa Educators
Lori Miller
Program Secretary
lorimill@iastate.edu

Expert Answers to Questions
Mike Zeller
Biotechnology Outreach Education Coord.
mzeller@iastate.edu

Kristen Hessler
Bioethics Outreach Coord.
khessler@iastate.edu
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 sciences educators better understand and deliver information about biotechnology to their students. Techniques for encouraging classroom bioethics discussions and information about GMO testing in food will be featured.

**June 23-25, 2004**

**Bioethics Workshop**

Iowa State University, Ames, Iowa

1 staff development credit - $20 and/or
1 ISU graduate credit - $305

$100 stipend available for Iowa schoolteachers ($50 per day)

Travel reimbursement available for ISU Extension educators/personnel (up to $50 per day)

This course is designed for educators who are interested in discussing bioethics with their students or extension audiences. The focus will be on ethical issues in biotechnology, especially agricultural biotechnology, but other topics relevant to both agriculture and human health will be covered.

Students will work through activities and case studies that they can take home and use with their classes. Pedagogical issues in teaching bioethics will also be covered, including: appropriate objectives for bioethics units; various approaches to bioethics pedagogy; how to relate bioethics issues to personal ethical issues familiar to students; how to help students identify ethical issues; how to address bioethics while respecting diversity of views in the classroom; and assessment for bioethics units.

**July 7-9, 2004**

**Biotechnology Education Workshop I for Agricultural Education Instructors**

Iowa State University, Ames, Iowa

1 staff development credit - $20 and/or
1 ISU graduate credit - $305

$150 stipend available for Iowa schoolteachers ($50 per day)

Travel reimbursement available for ISU Extension educators/personnel (up to $50 per day)

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 DNA extraction and transformation, DNA fingerprinting, chymosin, Bt corn, GMO testing, marker-assisted selection, and more. Techniques for encouraging classroom discussions of bioethics and issues surrounding biotechnology will be featured.

**July 12-16, 2004**

**Biotechnology Education Workshop II – Advanced Workshop for Science, Agriculture, and Family and Consumer Sciences Educators**

Iowa State University, Ames, Iowa

2 staff development credits - $20 and/or
1-2 ISU graduate credits - $305 per credit

$200 stipend available for Iowa schoolteachers ($50 per day)

Travel reimbursement available for ISU Extension educators/personnel (up to $50 per day)

This advanced workshop is open to science, agriculture, and family and consumer sciences 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, bioinformatics, sequencing, genomics, and more. Educators will prepare and perform the lab protocols that their students could do in class. Techniques for encouraging advanced classroom bioethics activities will be featured.

These workshops received support through a grant from the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture, under Agreement No. 00-52100-9617. Any opinions, findings, conclusions, or recommendations expressed during these activities are those of the instructors and participants and do not necessarily reflect the view of the U.S. Department of Agriculture.
Bioethics Online Courses for Summer

This summer, the Office of Biotechnology at Iowa State University is offering two online courses called “Teaching Bioethics” and “Ethics and Biotechnology.” The courses are designed for teachers, extension personnel, and others who educate youth and adult audiences about life sciences, including biotechnology, and who are interested in incorporating bioethics into their life sciences education.

Each course requires a minimum of 15 hours online, plus an additional 15 hours of reading, writing, and research. No prerequisites are required. Course participants can earn one graduate credit for each course from Iowa State University. One staff development credit for each course is available for participants from Iowa and may be available for those from other states. The courses are being offered in cooperation with Area Education Agency 11, Johnston, Iowa, and Iowa State University in Ames. Dr. Kristen Hessler, bioethics outreach coordinator at Iowa State University, will instruct both courses.

To register for one or both courses, please contact Lori Miller, 515-294-9818, toll-free in Iowa 800-643-9504, e-mail lorimill@iastate.edu. You also may register by filling out the form on p. 7 and mailing or faxing it to the address indicated on the form. Class enrollment for each course is limited to 20.

Brief descriptions of each course are below. For more information about course content, please contact Hessler at 515-294-7576, e-mail khessler@iastate.edu, or visit the web page: http://www.bioethics.iastate.edu/activities/biotechnology_ethics.html.

Teaching Bioethics
Date: June 14 - July 2, 2004
Registration deadline: June 4

This course is designed for any science or social studies teacher interested in teaching bioethics. Topics include: advantages of incorporating bioethics in science and social studies courses; appropriate objectives for bioethics units; a brief study of ethical theory; various approaches to bioethics pedagogy; how to relate bioethics issues to personal ethical issues familiar to students; how to help students identify ethical issues; how to address bioethics while respecting diversity of views in the classroom; and assessment for bioethics units.

Ethics and Biotechnology
Date: July 6-23, 2004
Registration deadline: June 29

Modern biotechnology is as controversial as it is promising. Teaching the associated ethical issues can help engage students to learn the relevant science concepts and to learn the skills necessary to contribute to ongoing social dialogue about science and society. Topics include an overview of ethical controversies about biotechnology and specific ethical issues in plant, animal, and human biotechnology.

The online courses received support through a grant from the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture, under Agreement No. 00-52100-9617. Any opinions, findings, conclusions, or recommendations expressed during the course are those of the instructor and participants and do not necessarily reflect the view of the U.S. Department of Agriculture.

BOEC Open House at Veishea April 17

The Biotechnology Outreach Education Center (BOEC) will host an open house from 9 a.m. to 5 p.m. during Veishea on Saturday, April 17. Visitors can explore the BOEC laboratory facilities and check out both new and tried-and-true activities and curriculum materials. The BOEC is located in room 1320 of the Molecular Biology Building on the northwest side of the Iowa State University campus in Ames.

If you plan to bring your students to the BOEC open house or want to stop by yourself, please contact Lori Miller for more information at 515-294-9818, toll-free in Iowa 800-643-9504, or send an e-mail message to lorimill@iastate.edu.

Veishea is Iowa State University’s annual student-run festival. For more information on other Veishea events, visit http://www.veishea.org/.

Summer Research Internship for 7-12 Grade Biology Teachers

Iowa State University is offering 7-12 grade biology teachers the opportunity to participate in a seven-week training and research internship in molecular biotechnology and genomics to be held in Ames from June 14 - July 30, 2004.

No prior biotechnology training is necessary to be accepted into this program. Teachers will be expected to complete a three-day theory and technique training workshop, after which they will conduct a small research project under the supervision of an ISU faculty member. Curriculum and instruction staff at ISU will help teachers develop classroom activities in molecular biotechnology and genomics.

The internship program is supported by the National Science Foundation, and stipends will be given to successful candidates. For further details please visit http://www.plantgenomeoutreach.eecob.iastate.edu/7-12%20teachers.htm or contact program coordinator Adah Leshem-Ackerman at 515-294-8453 or e-mail her at adah@iastate.edu. The application deadline is April 1.
Biotechnology Outreach Education Center

By Mike Zeller

BOEC Coordinator

Even though it seems a long time until warmer temperatures, spring will be here before we know it. This is an excellent time to include one or more biotechnology activities in your class, schedule a visit to camp and the BOEC, or have the BOEC come to you. This year, we have seen an increase in our visits to schools throughout Iowa. This is an excellent way to bring biotechnology concepts and techniques to your students without the worries of tight budgets and transportation scheduling. The spring calendar for the BOEC-directed sessions fills up quickly, so plan ahead. Typically, the BOEC will have over 1,000 visitors in April and May.

DNA fingerprinting kits and free lab supplies for Iowa teachers are in great demand. Please get your supply orders to Lori Miller (800-643-9304) early and reserve a kit well ahead of time at your AEA or regional extension office. Teachers in AEA 11 can contact us for a kit. Planning ahead will allow us to serve you better.

BOEC in Action

Even though the winter can be a slower than normal time for us in the BOEC, many schools and other education groups made visits to campus. Urbandale, Southeast Polk in Runnells, St. Augustin in Des Moines, Guthrie Center, Women in Science and Engineering at ISU, and Perkins Elementary in Runnells, St. Augustin in Des Moines, Guthrie Center, Women in Science and Engineering at ISU, and Perkins Elementary in Des Moines have all scheduled or made visits. The BOEC has made or will make visits to Central Campus in Des Moines for four Saturdays; the Des Moines Science Center; Ames

Northwood Elementary Science Night; northwest Iowa for two days, stopping at Granville Spalding HS and St. Mary’s HS of Remsen; 5th-8th grade talented and gifted students in Manning for a day, and finally to Atlanta, GA, to present at the National Science Teachers Association national convention.

In the early part of the spring semester at ISU, the departments of agricultural studies, biology, and engineering will once again bring their pre-service teachers to the BOEC for training in how to incorporate biotechnology principles and techniques into their future classrooms.

It is always a good time to remind you to look at the updates on our web site http://www.biotech.iastate.edu. Click on the Education link and see what’s new. Pay particular attention to the “classroom activities” and “biotechnology curriculum units” links/sections. There are 22 protocols and seven curriculums especially written for teachers to use in their classroom. With the pdf format, written materials can be downloaded and available with very little cost to teachers. Materials and supplies for activities can be sent to you free of charge by calling Lori Miller.

On March 17th, I will give two ICN presentations from Iowa Public Television stations in Johnston, IA, in the series “Genetic Engineering in Iowa” at 9 and 10 a.m. For more information visit the “Explore More: Genetic Engineering” link on the IPTV web site http://www3.iptv.org/exploreMore or call 800-532-1290.

Upcoming Events in the BOEC

The BOEC again will host an open house as part of ISU’s annual Veishea celebration on April 17 (see story on p. 3). On display will be some of our most recent, as well as our older established materials for you to review. If you are on campus for the fun, please stop in to visit and see what the BOEC has new to offer you.

This summer’s biotechnology workshop schedule promises to be the largest we have had to date. The Office of Biotechnology and BOEC will offer five workshops on the ISU campus in Ames (see p. 1 for details). First-time workshop participants or teachers who have attended previous workshops and want to update their knowledge and skills are welcome to attend one or more workshops.

To register for the Ames workshops, contact Lori Miller or complete the registration form on p. 7. In addition, we have tentatively agreed to do workshops hosted by the University of Northern Iowa in Cedar Falls the week of June 21 and Indian Hills Community College in Ottumwa the week of June 28. Please check our web site at www.biotech.iastate.edu/ed_resources/Workshops.html for updated information about registering for these two off-campus summer workshops.

Have a great spring semester!
Safety First

Student and teacher safety is the most important priority in the lab activities and protocols distributed by the Biotechnology Outreach Education Center at Iowa State. In this and future “Safety First” articles, some of the safety tips given in our lab activities and protocols are highlighted.

DNA Fingerprinting

Q: Why are teachers directed to wear medical or dishwashing gloves when preparing supplies for the DNA fingerprinting laboratory?
A: Gloves are recommended so the fingers will not contaminate the DNA samples. The DNA will not harm the teacher, but the teacher can harm the DNA.

Q: Teachers and students are advised to wear medical or dishwashing gloves throughout the preparation, loading, and running of the agarose gel. What’s the reason for this?
A: None of the chemicals used are toxic, but they may be irritating for people with sensitive skin. A heat-resistant glove is recommended before microwaving the agarose suspension to prevent burns when handling the hot flask.

Q: Why should the switch on the power supply be in the “Off” position before connecting or removing the lid to the electrophoresis chamber?
A: While the chances of receiving an electric shock from an electrophoresis box are slight, switching the power off eliminates this hazard.

The DNA fingerprinting protocol can be downloaded from http://www.biotech.iastate.edu/publications/ed_resources/Laboratory_protocols.html.

Spring Online Course

“Ethics and Animals” will be taught from April 5 through April 23. The registration deadline is March 22. For more information or to register, please visit our web site at http://www.bioethics.iastate.edu/activities/biotechnology_ethics.html or e-mail Lori Miller at lorimill@iastate.edu.

Summer Online Courses

Now is the time to register for summer online courses through the ISU Office of Biotechnology. This summer, we will be offering a condensed, three-week version of our online course, “Ethics and Biotechnology,” as well as our new online module, “Teaching Bioethics.” For more information and dates for either module, please refer to the announcement on p. 3, or e-mail me at khessler@iastate.edu.

Summer Bioethics Workshop

In addition to the online bioethics courses offered this summer, we will also host a bioethics workshop for teachers from June 23-25. If you can come to campus for a few days over the summer, consider attending the workshop as a way to learn about bioethics and how to incorporate bioethics topics into your curriculum. For details, see p. 2.

Report on Bioethics Retreat

The Office of Biotechnology co-sponsored this year's bioethics retreat, which was held on January 9 on the campus of Iowa State University. The topic was agricultural subsidies and global justice, and speakers included economists, philosophers, and representatives from the Iowa Farm Bureau Federation and the National Family Farm Coalition. Co-sponsors of the event were the ISU bioethics program and the Institute of Science and Society.

If you have any special interests in the area of bioethics that we are not addressing, please let us know! You can e-mail me at khessler@iastate.edu. I hope to see you online or in Ames this summer!
Career Conferences for Young Women Scheduled for April

Taking the Road Less Traveled is a career conference that invites Iowa young women in grades 6-12 to explore nontraditional careers for women in science, technology, engineering, and math. For grades 9-12, the spring conference date is April 1. For grades 6-9, the spring conference dates are April 8 or 15, 2004.

The conferences are sponsored by ISU’s Program for Women in Science and Engineering (PWSE). Registration forms are available on the PWSE web site at http://www.pwse.iastate.edu/outreach/trlt.html. For more information, e-mail outreach coordinator Stephanie Hamilton at slhamilt@iastate.edu or contact her at PWSE, 210 Laboratory of Mechanics, ISU, Ames, IA 50011-2131, ph. 515-294-5883, fax 515-294-6582.

Grants and Competitions

State Science Fair on March 26-27

The 2004 State Science and Technology Fair of Iowa (SSTFI) will be held March 26-27, 2004, in Ames. The SSTFI is affiliated with the Discovery Channel Young Scientist Challenge and the Intel International Science and Engineering Fair.

All high school exhibitors at the fair are eligible for scholarships. The Iowa Biotechnology Association (IBA) and the Iowa Space Grant Consortium (ISGC) are among those sponsoring tuition scholarships for this year’s fair. All student exhibitors in grades 6-12 are eligible for trophies, medals, and other special awards.

All entries and necessary forms must be postmarked no later than March 5th or received by March 8th, 2004. If students are attending a local science fair after the deadline that determines which students will be attending the state science fair, prior approval for a later deadline date may be obtained from SSTFI Fair Director Andrea Spencer.

For more information, visit http://www.iastate.edu/~isstf/ or contact Spencer c/o SSTFI, 52653 160th Street, Gilbert, IA 50105; phone 515-233-6512 or cell 515-460-5559; or e-mail spencer2@prairieinet.net.

Award Deadlines in March

The 2004 deadlines are approaching for the following grants, awards, and competitions. For more information, see the link listed for each opportunity.

March 5  State Science and Technology Fair of Iowa – http://www.iastate.edu/~isstf/

March 15  Award for Excellence in Encouraging Equity – http://www.nabt.org/sup/education/awards.asp

NABT Biotechnology Teaching Award – http://www.nabt.org/sup/education/awards.asp

Outstanding New Biology Teacher Achievement Award – http://www.nabt.org/sup/education/awards.asp

March 16  Craftsman/NSTA Young Inventors Awards Program – http://www.nsta.org/programs/craftsman

Low-Cost Resources

Free Forensic Science Units

Court TV and the National Science Teachers Association have collaborated on two forensics curriculum units, It’s Magic! and The Cafeteria Caper. The new units complement three units previously developed for middle school and high school students by Court TV and the American Academy of Forensic Sciences, The Celebration, The Car That Swims, and Renters Beware. To solve the mysteries in each unit, students use techniques such as enzyme tests, DNA analysis, handwriting analysis, pH tests, paper chromatography, gunshot residue tests, footprint castings, scientific reasoning, flame tests, a Kastle-Meyer test, and fingerprint matching.

To download the units, visit the Court TV web site at http://www.courttv.com/forensics_curriculum.

PBS Video on Genetic Engineering

Harvest of Fear, a NOVA/Frontline special broadcast by the Public Broadcasting Service (PBS), can be purchased by contacting PBS. The two-hour video explores the benefits and risks of genetic engineering. The videotape is in stereo and is closed captioned. The video can be ordered online for about $20 at http://www.shoppbs.org. Use the search box to find Harvest of Fear. Orders also can be placed by contacting PBS customer service at 1-800-531-4727.

For the most current information about the Office of Biotechnology’s education and bioethics opportunities, stop at: www.biotech.iastate.edu
Registration Form for 2004 Biotechnology Education Summer Workshops and Summer Online Bioethics Courses

Registrations due by MAY 28, 2004, for biotechnology education workshops. Registrations due by JUNE 4 and JUNE 29, 2004, for summer online courses.

Name ______________________________________________________________________________________________________
School district or extension area ________________________________________________________________________________
Subject areas taught___________________________________________________________________________________________
Home (summer) mailing address ___________________________________________________________________________________
Work phone ____________________    E-mail__________________________________    Home phone _______________________

I would like to register for the following Biotechnology Education Workshop(s) to be held at ISU in Ames:

_____ Workshop I for Science Educators, June 7-11    _____ Bioethics Workshop, June 23-25

_____ Workshop I for Family and Consumer Sciences, June 15-17    _____ Workshop I for Agriculture Educators, July 7-9

_____ Advanced Workshop II for Science, Agriculture, and Family and Consumer Sciences Educators, July 12-16

I would like to register for the following online course(s) that I can take on the Internet from home:

_____ Teaching Bioethics,  June 14 - July 2
Registration deadline: June 4

_____ Ethics and Biotechnology, July 6-23
Registration deadline: June 29

Credit available: 1-2 staff development credits AND/OR 1-2 graduate credits
(See workshop descriptions on p. 1 and online course descriptions on p. 3 for details.)

Credit payment and housing information will be sent to you when your registration is received.

Register early! Class sizes are limited. Return this registration form by mail or fax before the deadlines to:

Lori Miller
Office of Biotechnology
1210 Molecular Biology Building
Iowa State University
Ames, Iowa  50011-3260
Fax: (515) 294-4629 • Phone: (515) 294-9818 or toll-free in Iowa 1-800-643-9504 • E-mail: lorimill@iastate.edu

These workshops and online courses received support through a grant from the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture, under Agreement No. 00-52100-9617. Any opinions, findings, conclusions, or recommendations expressed during these workshops or courses are those of the instructors and participants and do not necessarily reflect the view of the U.S. Department of Agriculture.
About the ISU Public Education Program in Biotechnology.

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