Workshop, Online Course Registrations Due June 1

Registrations are due by June 1 for biotechnology education workshops offered at Iowa State University this summer and an online course in bioethics that participants can take using their home computers. Staff development or graduate credits will be offered for each workshop and the course.

For more information about the biotechnology education workshops or the online bioethics course, please phone Lori Miller at 515-294-9818, toll-free in Iowa at 1-800-643-9504, or e-mail her at lorimill@iastate.edu. To register for a workshop and/or the online course, please contact Lori or complete the form on p. 7 and mail or fax it to the address indicated on the form.

**An Introduction to Biotechnology Ethics – Online Course**
June 10-August 2
Taught via the Internet to participants at their homes
1 staff development - $20 in Iowa and/or
1 graduate credit from Drake University - $90
Course limited to 15 participants

Online course for high school teachers, extension personnel, and others who educate youth and adult audiences about the issues surrounding agricultural biotechnology. The course requires a minimum of 15 hours online, plus an additional 30 hours of reading, writing, research, and taking exams. Course participants will be introduced to moral philosophy and influential moral theories as tools to evaluate biotechnology arguments, both pro and con. Specific topics covered in the course include the ethical controversies surrounding Bt corn, transgenic animals, and vitamin A rice. All class work can be done on participants’ home computers. The course incorporate case studies for participants to experience and evaluate for use in their own classrooms. There will be extensive online discussion with other educators. By the end of the course, participants will be able to critically discuss and teach others about some moral issues surrounding particular biotechnologies. The ethics background learned also can be applied to other topics in the curriculum.

**Biotechnology Education Workshop I for Science Educators**
Biotechnology Outreach Education Center, ISU, Ames
June 10-14
2 staff development credits - $20 and/or
1-2 graduate credits - $244 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

(continues on page 2)
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.

### Biotechnology Education Workshop I for Agricultural Education Instructors
Biotechnology Outreach Education Center, ISU, Ames
June 18-20

1 staff development credit - $20 and/or
1 ISU graduate credit - $244
$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, DNA transformation, DNA fingerprinting, chymosin, Bt corn, and more. Techniques for encouraging classroom bioethics discussions will be featured.

### Biotechnology Education Workshop I for Family and Consumer Sciences Educators
Biotechnology Outreach Education Center, ISU, Ames
June 26-28

1 staff development credit - $20 and/or
1 ISU graduate credit - $244
$150 stipend available for Iowa schoolteachers ($50 per day)
Travel reimbursement available for ISU Extension educators/personnel (up to $50 per day)

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. Techniques for encouraging classroom bioethics discussions will be featured.

### Biotechnology Education Workshop II–Advanced Workshop for Science, Agriculture, and Family and Consumer Science Educators
Biotechnology Outreach Education Center, ISU, Ames
July 8-12

2 staff development credits - $20 and/or
1-2 graduate credits - $244 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 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, bioinformatics, and more. Educators will prepare and perform the lab protocols that their students could do in class. Techniques for encouraging classroom bioethics discussions will be featured.

### Using Biotechnology Basics to Strengthen K-12 Science Learning
Biotechnology Outreach Education Center, ISU, Ames
July 15-17

1 staff development credit - $45 and/or
1 ISU graduate credit - $244
$100 stipend available for Iowa schoolteachers ($50 per day)
Travel reimbursement available for ISU Extension educators/personnel (up to $50 per day)

To register - Heartland AEA 11, ph. 1-800-362-2720 or register online at http://www.aea11.k12.ia.us/prodev.html under Professional Development

This workshop course is directed at K-12 formal and informal educators and extension staff who want to gain skills in strengthening K-12 science learning through teaching basic biotechnology principles and procedures. Participants will learn about the basic principles of biotechnology and bioethics. They will learn how to prepare and instruct laboratory activities that include DNA extraction, DNA transformation, and DNA fingerprinting.

**These workshops and the bioethics online course 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.**

Support for materials and stipends for the workshops also was provided by the ISU Office of Biotechnology and by the Iowa Biotechnology Association that is a stakeholder participant in the USDA grant. The “Using Biotechnology Basics” workshop also is being funded by ISU’s Extension-Science, Engineering and Technology (E-SET) Program.
Educational Opportunities

Project BIO Online Science Courses for Summer and Fall 2002

Earning college credits online is an option available to teachers and high school students through Iowa State University's Project BIO. Science-related courses offered during summer and fall 2002 include:

**Summer 2002**
- Biol 109 Introductory Biology
- Biol 123 Environmental Biology
- Zool 155 Basic Human Physiology and Anatomy
- Gen 308/508 Biotechnology in Agriculture, Food, and Human Health

**Fall 2002**
- Biol 109 Introductory Biology
- Biol 123 Environmental Biology
- Biol 201 Principles of Biology I
- Zool 155 Basic Human Physiology and Anatomy
- Gen 308/508 Biotechnology in Agriculture, Food, and Human Health

For more information, check the Project BIO web site at [http://project.bio.iastate.edu](http://project.bio.iastate.edu) and follow the Online Courses link, or contact Dr. Tom Ingebritsen, phone 515-294-9432, e-mail tsingebr@iastate.edu. High school students in Iowa who want to take the courses under the Postsecondary Enrollment Options Act will find details about this program at [http://project.bio.iastate.edu/Courses/hsinfo.htm](http://project.bio.iastate.edu/Courses/hsinfo.htm).

VEISHEA Open House at BOEC

The Biotechnology Outreach Education Center will be hosting an open house from 9 a.m. to 5 p.m. on Saturday, April 20, during Iowa State's annual student-run VEISHEA festival. The Center is located in room 1320 of the Molecular Biology Building on the northwest side of campus. If you plan to bring your students to the open house or want to stop by yourself, you can get more information from Lori Miller at 515-294-9818, toll-free in Iowa 1-800-643-9504, or send an e-mail message to lorimill@iastate.edu.

Iowa Educators Invited to Attend Wisconsin Workshops

The biotechnology program at Madison Area Technical College (MATC) in Madison, WI, invites high school and college-level teachers to participate in two 5-day, laboratory intensive workshops this summer. These workshops in Madison are for educators interested in developing course materials or for industrial technicians who want to enhance their skills. Waivers of registration fees and travel stipends, supported in part by the National Science Foundation, are available for educators.

For detailed information about workshop content or to register online, see [http://www.madison.tec.wi.us/biotech](http://www.madison.tec.wi.us/biotech) or contact Rebecca Josvai at rjosvai@madison.tec.wi.us, phone 608-243-4234. Both workshops are limited to 20 participants.

**Proteins: Purification Techniques and Computer Modeling for the Proteomics Era**

May 28 - June 1, 2002

Fee: $800 covers the cost of the 5-day workshop and supplies, book, course materials, all lunches and banquet. Educators should inquire about stipends.

Registration deadline: April 29

Participants will learn about proteins by modeling the industrial isolation and purification of a protein product grown in *E. coli* cells.

**Biotech Boot Camp: Fundamental Laboratory Methods in a Regulatory Environment**

June 17-21, 2002

Fee: $650 covers the cost of the 5-day workshop and supplies, book, course materials, all lunches and banquet. Educators should inquire about stipends.

Registration deadline: May 17

This workshop is based on a one-semester course developed at MATC that introduces participants to basic biotech lab fundamentals from the perspective of an employee working in a regulated biotechnology environment.

News from the Biotechnology Outreach Education Center

Another school year is quickly coming to a close. This year, more than any other, has challenged Iowa education to maintain its high standards. World events and budget woes have put a great strain on everyone in education. Once again the Biotechnology Outreach Education Center and Office of Biotechnology would like to help you through these tough times. Because of the generosity of the ISU Office of Biotechnology, donors, and grants, we will continue to offer free training and equipment to Iowa's professional educators.

*(continued on p. 4)*
Educational Opportunities

Schedule Field Trips or School Visits
I encourage you to plan a field trip to the BOEC and Iowa State University, or if budget is a problem, have the BOEC come to you. More schools are taking advantage of the option that brings the BOEC to your school for a morning, afternoon, or whole day of biotechnology activities. Call Lori Miller or myself toll-free at 1-800-643-9504 to schedule your group.

Summer Workshops
This summer, the BOEC will offer summer workshops for K-12 and extension educators. Stipends to help offset the costs of attending the workshops on campus are available to Iowa educators. You also can earn staff development and/or graduate credit for the workshops. (See the article on p. 1 for details.) This will be the sixth summer that the workshops have been held on the Iowa State campus. Our goal is to fill every workshop. Please share this newsletter with colleagues and encourage them to attend one or more summer workshops.

Spring Activities
A number of Iowa schools and organizations have visited the BOEC, and each group did at least one biotech activity. These groups included home-schooled students from the Nevada area and some students from Gilbert High School, United Community Elementary School, Dallas Center Christian School, and Edgewood-Colesburg High School. Some sixth graders from Clive Elementary School, 14 juniors and seniors from Fort Dodge High School, a career fair group from Roland-Story High School, and the National Honor Society of Aplington-Parkersburg High School also traveled to the BOEC. On-campus visitors from ISU included pre-service elementary teachers in the Toying with Technology program, a group with Minority Student Affairs, and four visits from the Women in Science and Engineering (WiSE) Program.

Stops on my spring travel schedule included Starmont High School; Ames High School’s career day; the Rolling Hills Science Fair at Anita High School; industry training for Syngenta Seeds in Minneapolis, MN; and San Diego, CA, for the National Science Teacher’s Association meeting to present the “DNA in My Food” activity. I will be in Minneapolis in late May for a meeting of participants on a U.S. Department of Agriculture grant before starting summer workshops June 10.

Pre-Service Teacher Training Grows
With the inclusion of the BOEC in a successful grant for an ISU Learning Community, pre-service biology teachers at Iowa State will receive 15 hours of training in biotechnology beginning in the fall of 2003. The BOEC already provides biotech training to ISU undergraduates headed for teaching careers in family and consumer sciences or agricultural education. We encourage these new teachers to keep on utilizing BOEC services throughout their teaching careers.

New Units on the Way
Work continues on the development of the bioinformatics units, bacterial transformation with green fluorescent protein, and quantitative analysis of extracted DNA. All or parts of these activities will be introduced to the summer workshop participants for their analysis. The units that are viewed positively will be released in the fall and the others will be revised and given to the test teachers again for their review.

Share Your Expertise
If you have an activity or a really successful way to deliver biotechnology concepts to your students, please let us know about it. We can share it with other teachers through this newsletter.

Look for Us in the Fall
As the academic year comes to a close, this will be the last issue of the 2001-02 Iowa Biotech Educator. The next issue will arrive in late August to greet you as you start a new year. That issue will announce all the materials, old and new, that will be available for you during the 2002-03 school year.

We expect to have a new curriculum available for you that will help you explore Bt crops with your students. Plans are for the curriculum to have six modules covering the science behind Bt crops; the types of crops that contain Bt; production issues; risks and benefits; ethical, social, and legal issues; and the regulatory approval process.

Have a great, safe, and restful summer.

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C. F. Curtiss Distinguished Professor of Agriculture and Director of Biotechnology
Walter R. Fehr
Editor
Glenda D. Webber

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I am happy to report that Iowa’s first online bioethics course for teachers is in full swing! So far we have worked together on a case study about golden rice; learned about and discussed a couple of major moral theories; reviewed some basics about evaluating moral arguments; and shared our insights on ethical problems in education, such as cheating. We’re just starting to explore some ethical issues in human genetics, and from there we’ll go on to tackle the ethical issues surrounding transgenic animals. As you can see, we’ve been busy studying some fascinating questions!

Biotechnology and Human Rights Paper
In February, I traveled to Copenhagen, Denmark, where I presented a paper about biotechnology and human rights at an ethics conference called “Environmental Justice and Global Citizenship.” If you are interested in topics such as stakeholder attitudes towards biotech in developing countries, technology transfer of the bovine growth hormone in the U.S., land preservation, sustainable ecological communities, nuclear waste, and conflict resolution, check out the conference website at http://www.inter-disciplinary.net/e1dl.htm. The site has a conference program and abstracts of the papers presented. My entire paper soon will be available on our Office of Biotechnology web site at http://www.biotech.iastate.edu.

Summer Bioethics Course and More Case Studies
Now that spring is here, I’m working on bioethics projects for summer and fall. We’ll be offering the online bioethics course this summer from June 10 through August 2. (See p.1 for more details and p. 7 for a registration form.) I am also working to make several bioethics case studies more user-friendly for high school teachers. I’ll post the case studies on our web site as soon as they’re ready. I hope to have the case study on golden rice that we used in the online course available both on the web within the next few weeks and on the next biotechnology CD-ROM, due out this fall.

Invitation to Share Ethics Resources
I’m very interested to know how you are addressing ethical issues in your classrooms. If you have a strategy, curriculum, activity, or any other material that works for you and you’re willing to share it with others, please let me know. You can e-mail me at khessler@iastate.edu or phone me toll-free in Iowa at 1-800-643-9504.

Free CD of ISU Biotech Resources
Teachers and extension educators who want to access many of the resources of the ISU Office of Biotechnology homepage without going online can order a free biotech compact disc (CD) for their computer. First offered last fall, the CD will be revised with new resources added for the 2002-2003 school year.

The CD has many resources loaded directly on it that open when you click on the blue links. Sections marked with World Wide Web globe icons have links to web resources that open when your computer is connected to the Internet. When you first open the CD, check the text-only “Read Me File” for instructions on using the CD with Internet Explorer® or Netscape® browsers. The CD can be used on either PC or Macintosh computers with CD or DVD drives.

To order your free CD, contact Lori Miller at 515-294-9818, toll-free in Iowa at 1-800-643-9504, or e-mail her at lorimill@iastate.edu. The CD was designed and produced by Mike Zeller, Biotechnology Outreach Education Coordinator, and Joel Nott, Webmaster for ISU’s Public Education Program in Biotechnology.

Science and Our Food Supply
The Food and Drug Administration (FDA) and the National Science Teachers Association (NSTA) have jointly sponsored a free curriculum kit titled Science and Our Food Supply for middle or high school students. Students learn about bacterial growth in foods and how safe practices on the farm and new food processing technologies can lead to safer products. The kit includes separate teacher guides for middle and high school teachers, an interactive 46-minute video “Dr. X and the Quest for Food Safety,” a career guide, and a comprehensive “Food Safety A to Z Reference Guide.”

To order, teachers can write to NSTA, Science and Our Food Supply, 1840 Wilson Blvd., Arlington, VA 22201-3000; send a fax to the NSTA at 703-522-5413; or complete the online request form at http://www.nsta.org/fdacurriculum. For more information, visit the NSTA web site at http://www.nsta.org/fdacurriculum or the FDA web site at http://www.foodsafety.gov/~fsg/teach.html. At the FDA web site, some of the curriculum components are available online.
ISU Resources Save Teachers Time and Money

By Jennie Lobeck, Gilbert High School

Hi. My name is Jennie Lobeck. I'm a high school science teacher in Gilbert, Iowa, where I teach biology, human anatomy and physiology, and environmental science. I'm also the sponsor of our high school's new Science Club that has approximately 110 members.

When the folks at ISU's Office of Biotechnology asked me if I would tell you about how I use the free biotech equipment and supplies they provide, I said “yes” right away. I think any teacher who can should take advantage of these resources. The free supplies are a great way for me to save money while doing labs that the kids love.

This is my sixth year of teaching, and I've used the free ISU supplies and lab activities since my first or second year. I do some labs with my students every year, like the red colony DNA transformation of bacteria and DNA fingerprinting. I've also done the chymosin demonstration and the soybean flavor demonstration for lipoxygenase enzymes many times. This year I'm adding the “Bt vs. European Corr Borers” activity to my lesson plans. I've ordered everything from gels to micro-pipettors from Lori Miller at ISU. I live close to Ames, so I pick up my supplies, but ISU will send them postage-paid to educators anywhere in Iowa.

On February 21, I brought 25 students from the Gilbert High School Science Club to Ames for a visit to the Biotechnology Outreach Education Center. We spent about two hours doing a bioethics activity on vitamin A golden rice with Kristen Hesler from ISU's philosophy department. We also did a three-hour polymerase chain reaction (PCR) laboratory taught by BOEC coordinator Mike Zeller and Gary Polking of ISU's DNA Facility. Mike e-mailed me the results of our gels from the PCR activity and sent the actual gels to me shortly after our visit. It was great for me to have someone else do the teaching for a day, plus my students got to do a lab that I didn't have the time or equipment to do in my classroom.

If you'd like to contact me about how I use the ISU resources in my classes, my e-mail address is lobeckj@gilbert.k12.ia.us or you can phone my school at 515-232-3738. Enjoy the rest of the school year and have a great summer!

(Editor's Note: To order free biotech supplies and equipment or to schedule a visit to the BOEC, teachers can phone toll-free in Iowa 1-800-643-9504 or e-mail lorimill@iastate.edu.)

IPTV’s Explore More Genetic Engineering Web Site Wins National Eddie Award

In February, Iowa Public Television was awarded the 2001 Eddie Award in the “best companion content to a local broadcast” category for their EXPLORE MORE Genetic Engineering web site. The Eddie is the PBS Interactive award that recognizes preK-12 educational excellence. The EXPLORE MORE series helps students explore topics through multiple TV broadcasts, web sites, and interactive ICN events.

Mike Zeller, ISU’s Biotechnology Outreach Education Coordinator, is a consultant for the Genetic Engineering topic. He has instructed several ICN events dealing with genetically engineered foods and medicines.

EXPLORE MORE is funded through a grant from the Roy J. Carver Charitable Trust and partially funded by the U.S. Department of Education Star Schools program. For more information, visit http://www.iptv.org/exploreMore or contact Christy Antoniou at 515-242-5423.

Biotech on the Internet

Social, Economic, and Ethical Aspects of Biotechnology

http://www.biotech.iastate.edu/publications/IFAFS/default.html

Almost every week, new resources are added to ISU's web site for a U.S. Department of Agricultural grant that addresses the social, economic, and ethical aspects of biotechnology. Examples of resources that may interest teachers are course and

Please Recycle ISU Laboratory Supplies

Before leaving for the summer, please don't forget to recycle any free biotech lab supplies you ordered from ISU. To help keep costs down, we refill or reuse for other teachers empty 10X TBE bottles, Carolina Blu DNA Stain, and unused pipette tips/boxes. Please return these items to Lori Miller, Office of Biotechnology, 1210 Molecular Biology Building, ISU, Ames IA 50011-3260. Thank you, and enjoy your summer!
workshop opportunities, papers written by biotech experts about current issues in biotechnology, PowerPoint® presentations on ethics and ag biotechnology, ethics case studies for classroom use, and biotech newsletters from other states.

In the fall of 2000, Iowa State University and eight other land-grant institutions in Minnesota, North Dakota, South Dakota, and Wisconsin were awarded the $3.7 million grant from the Initiative for Future Agriculture and Food Systems (IFAFS) program of the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture.

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Registration Form for 2002 Biotechnology Education Summer Workshops and Online Bioethics Course

Registrations due by JUNE 1

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 10-14

_____ Workshop I for Family and Consumer Sciences Educators, June 26-28

_____ Workshop I for Agriculture Educators, June 18-20

_____ Advanced Workshop II for Science, Agriculture, and Family and Consumer Sciences Educators, July 8-12

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

_____ Bioethics Online Course, June 10-August 2

Credit available: 1-2 staff development credits AND/OR 1-2 graduate credits (See workshop descriptions on p. 1 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 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

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About the ISU Public Education Program in Biotechnology. . .

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