You Are Invited to Attend a Summer Workshop to Help Celebrate Our 25th Year

This is a very special year for the Office of Biotechnology at Iowa State University as we celebrate our 25th anniversary. You are invited to help us celebrate by attending one or more of the biotechnology or bioethics workshops offered at the Biotechnology Outreach Education Center in Ames this summer. Science, agriculture education, and family and consumer sciences educators in public or private schools or those who work with youth in 4-H or other community programs can update their biotechnology and bioethics teaching skills while they earn professional development or ISU graduate credits.

The workshops, instructed by Mike Zeller and Clark Wolf, will be held in 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 or personnel can receive travel reimbursements of up to $50 per day to help cover their expenses. Materials and stipends for the workshops are funded by Iowa State’s Office of Biotechnology and by the Iowa Biotechnology Association. Upon completion of any of the workshops, Iowa teachers are eligible to receive free supplies and equipment for specific lab protocols from the Office of Biotechnology.

For more information about the biotechnology education workshops see the descriptions that follow, contact Mike Zeller or Lori Miller toll-free in Iowa at (800) 643-9504, or e-mail mzeller@iastate.edu or lorimill@iastate.edu. For more information about the bioethics workshop, please contact Clark Wolf at (515) 294-3068 or e-mail jwcwolf@iastate.edu.

The deadline for registering for the 2009 summer workshops offered by the Office of Biotechnology at Iowa State University is May 29. To register for any workshop, please contact Lori, use the form on p. 7, or use the online registration or PDF forms available at www.biotech.iastate.edu/ed_resources/regs_form_summer2009.html. Please submit your registration to arrive by May 29.

Please feel free to share this invitation with your colleagues. We hope to see you in Ames this summer!

June 8-11
Biotechnology Education Workshop I for Science, Agriculture, and Family and Consumer Sciences Educators
Iowa State University, Ames, Iowa
2 professional development credits - $25
1-2 ISU graduate credits - $374 per credit
$200 stipend for Iowa schoolteachers ($50 per day)
Travel reimbursement available for ISU Extension educators/personnel (up to $50 per day)
Registration deadline - May 29

This workshop course is directed at science, agriculture, and family and consumer sciences educators who want to gain the basic knowledge and laboratory skills necessary to teach biotechnology in their classrooms. Teachers will learn how to prepare and instruct the laboratories in DNA extraction and quantification from various sources, DNA transformation, DNA fingerprinting, bioinformatics, bioethics, and more. Educators will prepare and perform the lab protocols as the students would do in class.

(continued on p. 2)
June 16-18
Bioethics Workshop I
Iowa State University, Ames, Iowa
1 professional development credit - $25
1 ISU graduate credit - $374 per credit
$100 stipend for Iowa schoolteachers ($50 per day)
Travel reimbursement available for ISU Extension educators/personnel (up to $50 per day)
Registration deadline - May 29

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 7-10
Biotechnology Education Workshop II – Advanced Workshop for Science, Agriculture, and Family and Consumer Sciences Educators
Iowa State University, Ames, Iowa
2 professional development credits - $25
1-2 ISU graduate credits - $374 per credit
$200 stipend for Iowa schoolteachers ($50 per day)
Travel reimbursement available for ISU Extension educators/personnel (up to $50 per day)
Registration deadline - May 29

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 biotechnology laboratories in their classrooms. Activities will include marker assisted selection, DNA isolation, recombinant DNA techniques, DNA amplification, restriction analysis of DNA, bioinformatics, sequencing, genomics, bioethics, and more. Educators will prepare and perform the lab protocols as their students will do in class.

Interested in attending the basic workshop June 23-24 at Southeastern Community College in West Burlington? Please contact:

Cathy Ziglar, Biology Instructor
Southeastern Community College
(319) 752-2731

--- Educational Opportunities ---

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 biotechnology and genomics to be held in Ames from June 8 - July 24, 2009. No prior biotechnology training is necessary to be accepted into this program. Teachers will be expected to complete a week-long theory and technique training workshop, after which they will conduct an independent 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 of $5,000 will be given to successful candidates. Participants who live farther than 30 miles from the ISU campus will be offered furnished housing at University Village at no additional cost. Participants will receive up to $500 to cover travel costs. For further details, please visit [www.eeob.iastate.edu/plantgenomeoutreach/7-12teachers.htm](http://www.eeob.iastate.edu/plantgenomeoutreach/7-12teachers.htm) or contact program director Dr. Adah Leshem-Ackerman at (515) 294-8453 or e-mail her at adah@iastate.edu. Applications are being accepted on a first-come, first-served basis.

--- Outreach News ---

Mike Zeller Receives IAS Award

Congratulations to Mike Zeller, Biotechnology Outreach Education Coordinator at Iowa State University, who has been awarded a Distinguished Service Award by the Iowa Science Teacher Section of the Iowa Academy of Science. The award recognizes an ISTS member “who has made sustained, extraordinary contributions to ISTS and/or to science education at the state and/or national level.”

Zeller has taught for 33 years, the first 24 in the science department of the Woodward-Granger School District and the last nine in the Biotechnology Outreach Education Center of the Office of Biotechnology. His numerous awards include a State of Iowa Regents Award for Staff Excellence, State of Iowa Finalist for the Presidential Awards for Excellence in Mathematics and Science Teaching in Secondary Science, and an Iowa Governor’s Teacher Award for Community Involvement in designing exemplary science programs. Zeller is a Fellow of the Iowa Academy of Science and has served as ISTS president in 1996 and on several other ISTS committees. He has represented the Office of Biotechnology as an exhibitor and/or presenter at the ISTS fall meeting every year since 2001.
Thanks for More than Two Decades of Support

As part of the Office of Biotechnology's 25th anniversary year, this article recognizes the many groups who played key roles in the development of the office's Public Education Program in Biotechnology. To all who have contributed to the success of the program through the years, the Office of Biotechnology extends its sincere thanks. Without your participation, Iowa State University's educational effort would not be the nationally-recognized program that it is today.

Thanks to Iowa's Teachers... 
More than 187,000 Iowa students have hands-on laboratory experience in biotechnology.

From the beginning of the Office of Biotechnology's public education program, Iowa's K-12 teachers have been willing to dedicate their valuable time and resources to provide biotechnology instruction to their students. More than 1,600 Iowa educators have learned to teach biotechnology through training offered by the Office of Biotechnology. The trained educators have access to equipment, laboratory supplies, and curricula provided at no cost to them by the Office of Biotechnology. The teachers involve their students in hands-on biotechnology activities in their own classroom and/or bring their students to the Biotechnology Outreach Education Center in Ames for laboratory instruction. Hats off to our exceptional Iowa educators for making the extra effort to give our students the opportunity to learn first-hand about the exciting science of biotechnology.

Thanks to Iowa's Area Education Agencies... 
Outstanding science, agriculture, and family and consumer sciences teachers from around the state partnered with the Office of Biotechnology's public education program.

The first educational efforts resulted from a National Science Foundation grant for biotechnology education that was awarded to the ISU Resource Center for Math and Science. The Office of Biotechnology contacted each Area Education Agency (AEA) in Iowa for nominations of their best science teachers who could participate in the grant activities. Many of this first group of teachers later became Biotechnology Master Teachers, and more than a decade later, one was hired as the Office of Biotechnology's outreach education coordinator. Several AEAs have served as distribution points for teachers to check out DNA fingerprinting kits provided free of charge by the Office of Biotechnology, and other AEAs have awarded professional development credits for the Office of Biotechnology's workshops and online courses.

Thanks to Iowa's Master Biotechnology Teachers... 
The Office of Biotechnology was able to expand the K-12 teacher-teach-teacher program to all of the 15 Area Education Agencies in Iowa during the early 1990's.

Master Biotechnology Teachers received training in biotechnology laboratory techniques and curriculum support from the Office of Biotechnology. A grant from the Howard Hughes Medical Institute Education Initiative supported a workshop in Ames during the summer of 1993 to train the first group of Master Biotechnology Teachers. The Master Biotechnology Teachers, in turn, presented in-service training workshops for their peers in their areas of the state. A grant from the Roy J. Carver Charitable Trust provided laboratory supplies for these in-service teacher workshops and laboratory kits that K-12 teachers could use free of charge. This grant's impact reached throughout Iowa. Every school district in the state received one of the free laboratory kits containing equipment for DNA extraction and transformation that could be used by teachers trained by the Office of Biotechnology and its Master Biotechnology Teachers. Continuing to the present, Master Biotechnology Teachers volunteer their time to help Iowa science, agriculture, and family and consumer sciences educators who are interested in incorporating biotechnology activities into their existing curriculums.

Thanks to ISU Extension Personnel... 
The demand for adult workshops, youth camps, and curriculum was met.

In its early days, the Office of Biotechnology hired an instructor from Biotechnology Training Programs, Inc., and an Iowa State University faculty member in what was then the Department of Zoology and Genetics to organize and instruct seminars and workshops for non-molecular biologists, such as agronomists, agricultural chemical dealers, farmers, food industry professionals, veterinarians, and nurses. When it became evident in early 1992 that the demand for workshops was more than two instructors could cover alone, ISU Extension crop production specialists began coordinating many of the adult workshops.

(continued on p. 4)
The ISU Extension Youth and 4-H Program and the ISU Extension-Science, Engineering, and Technology (E-SET) Program worked with a group of ISU Extension specialists and County Extension Education Directors to develop youth camp curriculum. The camps were held at 4-H campsites around the state where campers learned how agriculturalists, scientists, law enforcement officers, health professionals, environmentalists, and others use biotechnology in their careers.

ISU Extension editors and content experts on campus worked with writers from Biotechnology Training Programs, Inc., and the Office of Biotechnology to prepare a series of 11 publications called the Biotechnology Information Series. Beginning in 1994, the series was released to explain the basics of biotechnology and its applications to the non-scientist. The 11 titles were peer-reviewed and accepted as North Central Regional Extension Publications for the 13 land-grant universities of the 12 north central states. In addition, several curriculum packages for teachers to use with their students were written and produced by the E-SET program in cooperation with the Office of Biotechnology. The first one of these – *A Crime, A Clue and Biotechnology* – was used as the basis for forensic units and was released in 1996. Three biotechnology school enrichment packages for grades 4-5, 5-6, and 7-8 followed during the next two years. The Office of Biotechnology took the lead in producing several more curriculum packages that were written by its writers and released through the E-SET publication channels between 1999 and 2005. Curriculums for grades 9-12 on *Bacillus thuringiensis* and the impact of molecular technologies on animal, plant, and human genetics were written as part of a four-year, $3.7 million grant from the U.S. Department of Agriculture. The regional grant was awarded in 2000 to nine land-grant universities in Iowa, Minnesota, North Dakota, South Dakota, and Wisconsin to study the social, economic, and ethical aspects of biotechnology.

On a national level, the Office of Biotechnology secured funding from the U.S. Department of Agriculture Cooperative State Research, Education, and Extension Service for two national symposia held at Iowa State. A 1996 symposium explored Extension’s role in biotechnology education and a 2000 symposium examined engaged institutions’ role in biotechnology education. In addition to its contributions throughout the years, ISU Extension currently provides financial support to the Office of Biotechnology for educational efforts with Iowa teachers and their schools.

**Thanks to ISU Administrators, Colleges, Departments, and Faculty.**

**Graduate and undergraduate students, teachers, and the public can receive college credits for Office of Biotechnology courses.**

In the fall of 1993, the first experimental biotechnology course – Biotechnology in Agriculture, Food, and Human...
Health – was offered on the Iowa State campus and at seven Iowa community colleges for graduate or undergraduate credits. The course, developed by the same Department of Zoology and Genetics faculty member who instructed the early biotechnology workshops, covered the scientific principles and techniques of biotechnology; applications of biotechnology to crop and animal production and health, human health, food processing and nutrition; and regulatory and safety issues related to biotechnology. Since 1997, the course has been offered on the Internet through Project BIO, a partnership of biology educators and students at Iowa State University, Iowa community colleges, Iowa high schools, and Iowa industries.

In 1996, faculty and staff from the Biotechnology Instrumentation Facilities operated by the Office of Biotechnology began offering workshop modules for graduate students, faculty, staff, and other interested persons on molecular biology laboratory techniques such as DNA sequencing and polymerase chain reaction. This year, up to three credits can be earned by selecting from the 15 workshop modules in the course Molecular Biology Techniques.

During its entire history, the Office of Biotechnology has provided support for ISU's Bioethics Program. Beginning in early 2002, an online course in bioethics was taught by the bioethics outreach education coordinator for the Office of Biotechnology, who also was a faculty member in the Department of Philosophy and Religious Studies. An Introduction to Biotechnology Ethics, Iowa's first bioethics course that could be taken over the Internet, was designed to provide educators with the background, resources, and confidence they needed to lead ethics discussions. In 2004, two other online bioethics courses, Ethics and Animals and Teaching Bioethics, were offered. Today, the director of Iowa State University's Bioethics Program instructs summer bioethics workshops for the Office of Biotechnology.

By Mike Zeller
BOEC Coordinator

Biotechnology Outreach Education Center

This edition of the Iowa Biotech Educator begins a year full of educational events that will celebrate the 25th anniversary of the Office of Biotechnology. An article highlighting the history can be found on page 3.

In the spirit of the 25th anniversary, this edition has been sent to all of Iowa's life science, agriculture education, and family and consumer sciences educators inviting them to attend this summer's biotechnology education workshops. Along with the traditional professional development course work, special functions will highlight the workshops schedule.

Help celebrate this year's 25th anniversary by having your school send one or more educators to any of the three campus workshops being sponsored by the Office of Biotechnology. You can find more information on p. 1 and an application to the workshops on page 7 or at www.biotech.iastate.edu/publications/ed_resources/Workshops.html.

BOEC or Biotechnology Public Education Program Activities

During the first half of the school year, 1,323 students (35 groups and three ISU courses) have taken advantage of the BOEC's unique on- and off-campus education program. Additionally, the program received 89 requests for free supplies that serviced 3,791 Iowa students. Typically between February and late May, the public education program will have contact with more than 1,200 students through the BOEC's outreach efforts and will serve more than 10,000 students with free supplies. If you would like to take advantage of the opportunities the BOEC can offer and/or request free supplies, please contact Lori Miller or myself as soon as your schedule allows. By planning ahead we can better fulfill your requests.

Lastly, please share this newsletter with colleagues whom you feel may be interested and/or benefit from attending one of the summer workshops.

Have a great second semester, and please consider joining us to celebrate this memorable anniversary.

From Classroom to Career

Career Conferences for Young Women on April 9, 16, 23

Taking the Road Less Traveled career conferences sponsored by Iowa State University's Program for Women in Science and Engineering (PWSE) are scheduled for April. Young women in grades 6-12 can interact with professional women who have careers in science, engineering, math, and technology. The spring conference dates for grades 6-9 are April 16 and 23. For grades 9-12, the spring conference date is April 9.

Registration forms and details are available on the PWSE Web site at www.pwse.iastate.edu/outreach/trlt.html. For more information, e-mail Carol Heaverlo heaverlo@iastate.edu or contact her at PWSE, 218 Carver Hall, Iowa State University, Ames, IA 50011-2060, phone (515) 294-5883.
**Grants/Competitions**

### State Science and Technology Fair on March 27-28

The 2009 State Science and Technology Fair of Iowa (SSTFI) will be held in Ames on Friday and Saturday, March 27-28. The SSTFI is affiliated with the Intel International Science and Engineering Fair. All high school exhibitors at the fair are eligible for college scholarships. In addition, the top biological and physical high school projects will represent the SSTFI at the Intel International Science and Engineering Fair in Reno, Nevada, in May. All exhibitors in grades 6-12 are eligible for trophies, medals, and other special awards.

As one of the fair sponsors, the Iowa Biotechnology Association (IBA) will be making five scholarship awards at the 2009 fair. The IBA scholarships will be awarded to the five students who exhibit the best use of biotechnology with their projects. All Iowa high school students who exhibit at the fair are eligible for the IBA scholarships, which are $2,000 if used at an Iowa school of higher education or $1,000 if used at an out-of-state institution of higher education. The 2008 winners were Ryan Brasser, South O'Brien High School; Altreya Day, Maharishi School; Qiushuang (Michelle) Jin, West Senior High School; Carrie Wubben, Woden-Crystal Lake-Titonka High School; and Peter Yin, Ames High School.

Volunteers are being recruited to judge at this year’s event. College graduates or undergraduate or graduate students with degrees or majors in a science, science education, engineering, mathematics, or computer science area can serve on judging teams. Individuals with Ph.D. degrees in those areas are needed to serve as judging team leaders. To register online to be a judge, go to [www.sciencefairofiowa.org/judges.html](http://www.sciencefairofiowa.org/judges.html).

For more information, visit [www.sciencefairofiowa.org/](http://www.sciencefairofiowa.org/) or contact fair director Andrea Spencer, phone (515) 460-5559, e-mail aspence@iastate.edu.

### NSF Seeks Nominations for Presidential Teaching Awards

The National Science Foundation (NSF) is accepting online nominations for the 2009 Presidential Awards for Excellence in Mathematics or science teachers of grades 7-12 in a public or private school in one of the 50 states or Washington, D.C., Puerto Rico, Department of Defense Schools, or the U.S. Territories. Nominees must have at least five years of mathematics or science teaching experience prior to application and not have received the national PAEMST award in any prior competition or category. Elementary school teachers, grades K-6, will be eligible to apply in 2010.

Award winners receive $10,000 from the National Science Foundation; a citation signed by the President of the United States; a paid trip for two to Washington, D.C., to attend a week-long series of recognition and professional development events; and gifts from program sponsors from around the country.

For more information e-mail info@paemst.org or visit the Web site at [www.paemst.org](http://www.paemst.org). Online nominations of teachers should be done early enough to allow the nominated teacher time to thoroughly prepare an application before the May 1, 2009, deadline.

### Grants, Awards, and Competitions

For more information about the following science-related scholarship competitions for students or educator award programs, visit the Office of Biotechnology's educational funding Web site at [www.biotech.iastate.edu/publications/ed_resources/Ed_funding.html](http://www.biotech.iastate.edu/publications/ed_resources/Ed_funding.html). Brief descriptions of each opportunity and links to more information are on the site. If you know of other opportunities in science, family and consumer sciences, or agriculture that should be added to the Web site, please e-mail them to Glenda Webber, gwebber@iastate.edu.

Opportunities with late winter deadlines include the following:

**Horace Mann Scholarship Program for Educators**  
**Deadline:** Received by February 29, 2009  
Four-year scholarships for K-12 educators

**The Ron Mardigian Biotechnology Teaching Award**  
**Deadline:** Received by March 15, 2009  
Funds for a short-term series of activities or a long integration of biotechnology into the curriculum implemented by secondary school teachers or undergraduate college biology instructors

**Outstanding New Biology Teacher Achievement Award**  
**Deadline:** Received by March 15, 2009  
Recognizes outstanding teaching by a 7-12 grade biology/life science instructor within first three years of teaching when nominated
Registration Form for 2009 Biotechnology Education Summer Workshops

Registrations are due by MAY 29, 2009, for all workshops.

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 Iowa State University in Ames:

_____ June 8-11  Biotechnology Education Workshop I for Science, Agriculture, and Family and Consumer Sciences Educators

_____ June 16-18 Bioethics Workshop I

_____ July 7-10  Advanced Biotechnology Education Workshop II for Science, Agriculture, and Family and Consumer Sciences Educators

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

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 deadline 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

Online registration available at www.biotech.iastate.edu/ed_resources/regis_form_summer2009.html

Publicity/Image/Voice Permission
The Office of Biotechnology normally takes photographs, video, and/or tape recordings of our programs. During these workshops, a photograph or video/audio recording may be taken of you. Unless you request otherwise, your application will be considered permission for Iowa State University and the Office of Biotechnology to photograph, film, audio/video tape, record and/or televise your image and/or voice for use in any publications or promotional materials, in any medium now known or developed in the future without any restrictions. If you object to ISU using your image or voice in this manner, please notify the Office of Biotechnology, in writing, at the time of your application.

Iowa State University does not discriminate on the basis of race, color, age, religion, national origin, sexual orientation, gender identity, sex, marital status, disability or status as a U.S. veteran. Inquiries can be directed to the Director of Equal Opportunity and Diversity, 3680 Beardshear Hall, (515) 294-7612.
About the ISU Public Education Program in Biotechnology...

Iowa State University's Public Education Program in Biotechnology is supported by ISU Extension; Ajinomoto Food Ingredients, LLC/Ajinomoto Heartland, LLC; Bayer CropScience; Cargill; Genencor International, Inc.; Golden Harvest Research; Growmark; The Greater Cedar Rapids Foundation–Diamond V Mills Donor-Advised Fund; the Iowa Biotechnology Association; the Iowa Farm Bureau Federation Agriculture Foundation; the Iowa Soybean Promotion Board; Kemin Americas; MBS Genetics, LLC; Pioneer Hi-Bred International, Inc.; the Roy J. Carver Charitable Trust; Syngenta Seeds, Inc.; West Central Cooperative; and private individuals.

To Contact the Program
Phone: (515) 294-9818 or, toll-free in Iowa, (800) 643-9504
Fax: (515) 294-4629
E-mail: biotech@iastate.edu
WWW: www.biotech.iastate.edu

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Glenda Webber, Editor
Joel Nott, Assistant Scientist, Homepage Webmaster