

Iowa Biotech Educator

A newsletter of the Iowa State University Office of Biotechnology • Volume 21 • Number 1 • Winter 2013

This Is Your Invitation to Attend Summer 2013 Workshops

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Office of Biotechnology
1210 Molecular Biology Building
Ames, Iowa 50011-3260
515 294-9818
FAX 515 294-4629

Dear Science, Agriculture Education, Family and Consumer Sciences, and Extension and Outreach Educators:

You are invited to attend one or more of the biotechnology or bioethics workshops offered in Ames this summer. Educators in public and private schools or those who work with youth in 4-H or other community programs can strengthen and update their STEM-based curriculums with modern content, techniques, and activities in biotechnology and bioethics, while earning professional development or ISU graduate credits at the workshops.

The workshops, instructed by Clark Wolf and myself, will be held in the Biotechnology Outreach Education Center (BOEC) on the Iowa State campus. Iowa teachers can receive stipends of \$50 per day to help cover their costs of attending. ISU Extension and Outreach 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 and ISU Extension and Outreach educators are eligible to receive free supplies and equipment for specific lab protocols from the Office of Biotechnology. For workshop details and registration information, see the article below.

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

Sincerely,
Mike Zeller
Biotechnology Outreach
Education Coordinator

Summer Workshop Descriptions

For more information about the biotechnology education workshops, see the descriptions on the next page, contact Mike Zeller or Lori Miller toll-free in Iowa at 800 643-9504, or e-mail mzeller@iastate.edu

iastate.edu or lorimill@iastate.edu. For more information about the bioethics workshop, please contact Clark Wolf at 515 294-3068 or e-mail jwewolf@iastate.edu.

The deadline for registering for the 2013 summer workshops offered by the Office of Biotechnology at Iowa State University is June 3, 2013.

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IOWA STATE UNIVERSITY
Helping educators become their best.

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Connect to Biotech

Office of Biotechnology
1210 Molecular Biology Bldg.
Iowa State University
Ames, Iowa 50011-3260
ph. 515 294-9818
800 643-9504 toll-free in Iowa
fax 515 294-4629
biotech@iastate.edu
www.biotech.iastate.edu

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

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

To register for any workshop, please contact Lori, complete and mail the form on p. 7, or use the online registration or PDF forms available at www.biotech.iastate.edu/ed_resources/regis_form_summer2013.html. Please submit your registration to arrive by June 3, 2013.

**June 10-13
Biotechnology Education Workshop I for Science, Agriculture, Family and Consumer Sciences, and ISU Extension and Outreach Educators**

Iowa State University, Ames, Iowa
2 professional development credits - \$25
1-2 ISU graduate credits - cost to be announced
\$200 stipend for Iowa schoolteachers (\$50 per day) funded by the [Iowa Biotechnology Association](http://www.iowabiotech.org)
Travel reimbursement available for ISU Extension and Outreach educators/personnel (up to \$50 per day)
Registration deadline - June 3, 2013



This workshop course is directed at science, agriculture, family and consumer sciences, and ISU Extension and Outreach 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, and more. Educators will prepare and perform the lab protocols as the students would do in class.



**June 17-20
Bioethics Workshop I**

Iowa State University, Ames, Iowa
2 professional development credits - \$25
2 ISU graduate credits - cost to be announced
\$200 stipend for Iowa schoolteachers (\$50 per day)
Travel reimbursement available for ISU Extension and Outreach educators/personnel (up to \$50 per day)
Registration deadline - June 3, 2013

This course is designed for educators who want to incorporate discussion of ethical issues with students, to integrate some ethical content in the science curriculum, or to address such issues for extension audiences. The focus will be on ethical issues in science education, with attention to agricultural biotechnology. However, other topics relevant to both agriculture and human health will also be covered. Participants will work through activities and case studies that they can take home and use in their classes. In the course of the workshop, participants will be divided into groups to develop their own case studies on topics relevant to their courses. The workshop will also address pedagogical issues, including appropriate objectives for bioethics units; alternative 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.

**June 24-27
Biotechnology Education Workshop II – Advanced Workshop for Science, Agriculture, Family and Consumer Sciences, and ISU Extension and Outreach Educators**

Iowa State University, Ames, Iowa
2 professional development credits - \$25
1-2 ISU graduate credits - cost to be announced
\$200 stipend for Iowa schoolteachers (\$50 per day) funded by the [Iowa Biotechnology Association](http://www.iowabiotech.org)
Travel reimbursement available for ISU Extension and Outreach educators/personnel (up to \$50 per day)
Registration deadline - June 3, 2013



This advanced workshop is open to science, agriculture, family and consumer sciences, and ISU Extension and Outreach 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, and more. Educators will prepare and perform the lab protocols as their students will do in class.



Improve your hands-on laboratory skills at the summer biotech workshops! Register online or use the form on p. 7. Photo by Mike Zeller

BOEC Web Pages Will Have New Look

The Office of Biotechnology's website at www.biotech.iastate.edu is being updated, including Web pages related to the Biotechnology Outreach Education Center. The main page will have links to resources for educators, where you will find the BOEC pages. Watch for more details in the next issue of the *Iowa Biotech Educator*.

Mike Zeller, Biotechnology Outreach Education Program Receive Awards from Iowa Academy of Science

Iowa State University's Office of Biotechnology received two 2012 Friend of Science awards from the Iowa Science Teachers Section (ISTS) of the Iowa Academy of Science. The awards recognize individuals and corporations in the state who have provided significant and exemplary service to the science education community of Iowa. The awards were presented at the annual ISTS fall conference held October 16 in Ames.

Mike Zeller received an individual Friend of Science Award. Zeller is the current Biotechnology Outreach Education Coordinator at Iowa State University, arriving in Ames after a 24-year career as an Iowa high school science teacher. Since 2000, Zeller has led in the development of the university's biotechnology outreach education program, which has become a national model.

Zeller manages the Biotechnology Outreach Education Center (BOEC), a 2,300 square-foot state-of-the-art teaching/education laboratory located in the Molecular Biology Building on campus. The center hosts graduate classes and workshops for research, pre-service and professional educators, industry, and foreign educators and dignitaries. K-12 school groups regularly schedule visits to the BOEC to experience hands-on activities.

Since joining the Office of Biotechnology part-time in 1997 and full-time in 2000, Zeller has trained almost 2,500 Iowa educators, helping to provide them with equipment, supplies, curriculum packages, and expertise to take back to their schools. These teachers have, in turn, provided high-quality biotechnology instruction to more than 250,000 students in Iowa schools.

The Biotechnology Outreach Education Program received a Friend of Science award in the corporate category. The program began in 1985 as an initiative of Iowa State University's Office of Biotechnology to help K-12 teachers, extension professionals, and the general public learn about the science behind new biotechnology developments and the issues surrounding them. With support from the university, many of Iowa's commodity groups and biotechnology companies, and individuals, the Biotechnology Outreach Education Program has expanded its programs and services through the years.

Key features of the Biotechnology Outreach Education Program include a free equipment and supplies program that began in 1993 when the Biotechnology Outreach Education Program was awarded a grant from the Roy J. Carver Charitable Trust. The 2012-2013 school year marks the 19th consecutive year that the program is offering Iowa teachers and ISU Extension and Outreach educators

free equipment, supplies, and instructional materials for biotechnology lab activities.

Educator questions are answered by a full-time biotechnology outreach education coordinator at Iowa State or a network of master teachers throughout Iowa gives educators the support they need to be successful. A free newsletter and website are packed with many more useful resources.

The Biotechnology Outreach Education Center, established in 2000 on the Iowa State campus, has two state-of-the-art laboratories with a total of 40 lab stations and a prep room. The center hosts workshops and courses throughout the year where educators practice the lab preparation and experiments they will be teaching. During the school year, teachers are invited to bring their students to the center on field trips to experience hands-on activities. The program has expanded in recent years to offer pre-service training for students who are preparing to be teachers of science, agricultural education, or family and consumer sciences.



Receiving the Friend of Science Award from ISTS chair De Anna Tibben are from left, Mike Zeller, Lori Miller, and James Reecy, representing the Biotechnology Outreach Education Program of the Office of Biotechnology. Photo by Tom Ervin

— 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 six-week training and research internship in molecular biotechnology and genomics to be held in Ames from June 12 - July 26, 2013 (contingent on unforeseeable snow days!).

No prior biotechnology training is necessary to be accepted into this program. Teachers new to the program will be expected to complete a three-day theory and technique training workshop (June 10-11, 2013), after which they

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will conduct an independent research project under the supervision of an ISU faculty member. Curriculum and instruction staff at ISU, together with master teachers, will help teachers develop classroom activities in molecular biotechnology and genomics.

The internship program is supported by the National Science Foundation, and stipends of \$5,600 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 expenses.

For further details, please visit www.eeob.iastate.edu/plantgenomeoutreach/7-12teachers.html or contact program director Dr. Adah Leshem at 515 294-8453 or e-mail her at adah@iastate.edu. Applications are being accepted on a first-come, first-served basis. Offers will be sent out to potential candidates beginning April 1, 2013. Placements will be made by May 1, 2013.

Summer Academy on Biorenewables for Middle School Science Teachers

Iowa State University is offering middle school science teachers the opportunity to participate in a three-week professional development workshop to study the methods of biomass utilization to produce biorenewable products, including biofuels and bio-materials. The Summer Academy will be held on the Iowa State campus in Ames from July 8 - July 26, 2013. Participants will be eligible for either continuing education or graduate credit.

No prior knowledge in this area is necessary to be accepted into this program. Teachers will be introduced to cutting-edge research under way at Iowa State to address the global challenges facing society's dependence on finite sources of fossil based energy. The Summer Academy will include STEM curricula associated with this topic applicable to the Iowa Core Curriculum and middle school science standards and benchmarks.

The three weeks will include presentations by faculty and staff, hands-on lab activities, and field trips to Iowa's biorenewables-related research facilities and bio-based industries. Teachers will collaborate and develop classroom material to present to their students about biorenewables and associated careers. The program will be facilitated by Eric Hall, Hoover High School, Des Moines.

The Summer Academy is supported by the National Science Foundation. Stipends of \$2,400 and up to \$500 to cover travel expenses will be given to successful candidates. Teachers who live farther than 30 miles from the Iowa State campus will be offered furnished housing at University Village at no additional cost.

Further details can be found at www.cbirc.iastate.edu/education/precollege/summer-academy, or contact program director Dr. Adah Leshem at 515 294-8453 or e-mail her at adah@iastate.edu. Applications are being accepted on a first-come, first-served basis. Offers will be sent out to potential candidates beginning April 1, 2013. Placements will be made by May 1, 2013.

Awards/Competitions

Awards for Iowa Educators

For more award opportunities, visit www.biotech.iastate.edu/publications/ed_resources/Ed_funding.html.

Iowa Academy of Science Excellence in Science Teaching Awards

For more than 50 years, the Iowa Academy of Science has recognized outstanding science teachers in Iowa's K-12 schools through the Excellence in Science Teaching Awards Program. Iowa teachers of all grade levels in all science areas are eligible to be nominated by administrators, colleagues, or by self-nomination. The six nomination categories are elementary science, earth/space science/environmental science, general/multiple science, life science, middle school/junior high science, and physical science. Winners receive \$200, a plaque, and recognition at a luncheon during the Iowa Academy of Science annual meeting. Applications are accepted from February 1 through the following January 31. For more information, e-mail iascience@uni.edu or visit the website at www.iacad.org/recognize.html.

Congratulations to the 2012 winners in Elementary Science – Donna R. Johnson, Neil Armstrong Elementary School, Bettendorf, and Christine Sutherland, Kreft Primary School, Council Bluffs; Earth/Space/Environmental Science – Teri Lynn Wiese, North High School, Davenport; General/Multiple Science – Kris Groff, Sheldon High School, Sheldon; Life Science – Mike Goudy, Oskaloosa High School, Oskaloosa; Middle/Junior High Science – Joan

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James M. Reecy
Professor of Animal Science and
Director of the Office of Biotechnology

Glenda D. Webber
Editor

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Moorhead, Williams Intermediate School, Davenport; and Physical Science – Kevin B. McGinity, Ottumwa High School, Ottumwa

National Science Foundation Seeks Nominations for Presidential Teaching Awards

The National Science Foundation is accepting online nominations of teachers of grades 7-12 for the 2013 Presidential Awards for Excellence in Mathematics and Science Teaching. Enacted by Congress in 1983, this award is the highest recognition that a mathematics or science teacher in the United States can receive. The competition alternates each year between teachers of grades 7-12 (2013) and teachers of grades K-6 (2014). The award includes \$10,000, a citation signed by the President of the United States, a paid trip for two to Washington, D.C., and more. For details, e-mail info@paemst.org or visit the website at www.paemst.org. Online nominations open this fall and close April 1, 2013. The application deadline for nominated teachers is May 1, 2013. Nominations of teachers should be done early enough to allow the nominated teacher time to thoroughly prepare an application before May 1.

Congratulations to the 2011 Iowa winners Karla Digmann, George Washington Middle School, Dubuque, (Mathematics) and Jody Stone, Malcolm Price Laboratory School/University of Northern Iowa, Cedar Falls (Science).

Nominate a Colleague or Yourself for the NABT Outstanding Biology Teacher Award

Every year, the Outstanding Biology Teacher Award (OBTA) program of the National Association of Biology Teachers (NABT) tries to recognize an outstanding biology educator (grades 7-12) in each of the 50 states; Washington, D.C.; Canada; Puerto Rico; and overseas territories. Candidates for this award do not have to be NABT members, but they must have at least three years public, private, or parochial school teaching experience. A major portion of the nominee's career must have been devoted to the teaching of biology/life science. Candidates are judged on their teaching ability and experience, cooperativeness in the school and community, inventiveness, initiative, and student-teacher relationships. OBTA recipients are honored at a special event during the NABT Professional Development Conference sponsored by BIOZONE and receive microscopes from Leica Microsystems, Inc., and certificates and a one-year membership from NABT.

To nominate a colleague or yourself, follow the nomination instructions found in the Awards and Opportunities section of the NABT website at www.nabt.org. The deadline for 2013 nominations is March 15, 2013. For more information, contact Iowa's OBTA Awards Directors Mike Zeller, mzeller@iastate.edu, or Doug Herman, herman.doug@iccsd.k12.ia.us. Congratulations to the 2012 Iowa winner, Laura McCreery, North High School, Davenport.

State Science and Technology Fair

The 2013 State Science and Technology Fair of Iowa (SSTFI) will be held in Ames on Thursday and Friday, April 4-5. 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 senior high projects will compete at the Intel International Science and Engineering Fair in Phoenix, Arizona, 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 2013 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 2012 winners were Camille Adajar, Central Lee High School, Donnellson; Pavane Gorrepati, Rivermont Collegiate, Bettendorf; Meghana Pagadala, Rivermont Collegiate, Bettendorf; Wyatt Sickelka, South O'Brien Secondary School, Paullina; and Victoria Whitcomb, Burlington Community High School.

For more information, visit www.sciencefairiowa.org or contact fair director Andrea Spencer, phone 515 460-5559, e-mail aspence@iastate.edu. Volunteers are being recruited to judge at this year's event. For details, contact Vicki Speake, 515 294-5738, e-mail speake@iastate.edu.

Outreach News

Biotechnology Outreach Education Center



Mike Zeller, BOEC Coordinator, received an individual Friend of Science award presented by De Anna Tibben at the Fall Conference of the Iowa Science Teaching Section of the Iowa Academy of Science.

Photo by Tom Ervin

Welcome to the Winter 2013 edition of the *Iowa Biotech Educator* newsletter. This issue is jammed full of information that can help you, your curriculum, and your school teach the most modern STEM techniques and concepts in life sciences. Please share the newsletter with your colleagues so they, too, can benefit from this information.

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I want to remind you that the Biotechnology Outreach Education Center (BOEC) is here to help you enhance your STEM initiatives with biotechnology and resources. Just contact Lori Miller or me anytime you need supplies, equipment, to schedule a visit to the BOEC or your classroom, and/or need questions answered. Phone us at the toll free number 800 643-9504 or e-mail lorimill@iastate.edu or mzeller@iastate.edu. You can call anytime with questions. I have arranged my schedule so that most days I am available from 7-8:30 a.m. and 11:30-1:00 p.m. for questions, except when I travel.

As spring semester moves forward, the demand for the BOEC outreach services increases. Please order supplies as soon as your schedule allows for your spring classes. If you are planning to take advantage of the BOEC's unique on- and off-campus outreach education program, please contact Lori or me to schedule a date. Typically, the outreach programs are very busy in the spring. Last year, more than 3,000 students either visited the BOEC or had the BOEC make presentations at their schools. During that same time, the BOEC provided supplies and equipment for biotechnology experiments to 139 teachers in 123 Iowa schools, serving nearly 13,000 students.

This edition of the *Iowa Biotech Educator* officially announces the dates and contains information about this summer's Biotechnology Education Workshops, including how to register (see p. 1). Every couple of years, we add new activities and speakers to the workshop schedule. If it has been a few years since you have taken a workshop and feel you need a review, or if you are ready for the advanced workshop, please register as soon as possible and encourage a colleague to attend. You can find the 2013 summer workshops information on our website at www.biotech.iastate.edu/ed_resources/Workshops.html.

BOEC at Home and on the Road

This fall, I was kept busy teaching ISU pre-service teachers from agricultural education, family and consumer sciences, and the Master of Arts in Teaching (MAT) degree program, while still presenting to 30 groups either in the BOEC or at Iowa schools. Some school groups visiting the BOEC were Marshalltown Middle and High School; GMG Schools from Green Mountain and Garwin; South Hardin Middle School, Hubbard; Vinton-Shellsburg High School; Indianola High School; and Estherville High School. I also made visits to Scavo High School in Des Moines, Walnut Creek Middle School in West Des Moines, Garner-Hayfield Elementary, and Harding Middle School in Des Moines.

Iowa State groups that visited the BOEC included the Freshman Honors Program, Science Bound, and ISU Admissions. I also made presentations to the "Taking the Road Less Traveled" conferences offered by the Program for Women in Science and Engineering. For more information

about classroom and event visits or field trips to the Iowa State campus, please contact Lori Miller or me.

BOEC State and National Conference Participation

October and November found me traveling to state and national science education conventions. We made our annual appearance at the Iowa Science Teachers Section (ISTS) of the Iowa Academy of Science at the Scheman Conference Center on the ISU campus in Ames. It was great to see many of our Iowa teaching colleagues and past workshop participants at our booth. It is always exciting to visit with teachers who are searching for ways to bring biotechnology into their classrooms.

I also attended the National Association of Biology Teachers (NABT) convention in Dallas, Texas. Attending state, regional, and national science teacher conventions gives me an opportunity to gain new knowledge in the most recent science education trends, legislation, standards, and pedagogy. My goal is to gain new ideas, methods, techniques, and activities that I can share with you.

Make Plans Today

Remember, if you are planning a visit to the BOEC or would like the BOEC to come to your classroom, contact Lori or me as soon as you can to reserve a date. The spring schedule traditionally fills up fast, so please plan ahead. I hope you will let the BOEC and the Office of Biotechnology assist you in bringing biotechnology into your classroom.

Have a great spring semester!

New Protocol from the BOEC – Green Fluorescent Protein Transformation

A new transformation protocol is now available from the Biotechnology Outreach Education Center. You can now have your students transform bacteria to express green fluorescent protein (GFP). This protein will allow the bacteria to glow green when exposed to black light.

GFP has a historic beginning in cancer research as a marker. The new protocol's techniques and procedures are identical to the very popular and successful ampicillin resistance transformation offered by the BOEC. The differences in the GFP protocol are using a different strain of bacteria (DH5 alpha) and then the GFP plasmid.

The GFP protocol instructions and supplies are available on request from Lori Miller, lorimill@iastate.edu, or Mike Zeller, mzeller@iastate.edu.



Registration Form for 2013 Biotechnology Education Summer Workshops

Registrations are due by June 3, 2013, 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 10-13 Biotechnology Education Workshop I
for Science, Agriculture, Family and Consumer
Sciences, and ISU Extension and Outreach Educators

_____ June 24-27 Advanced Biotechnology
Education Workshop II for Science,
Agriculture, Family and Consumer
Sciences, and ISU Extension and
Outreach Educators

_____ June 17-20 Bioethics Workshop I



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

Credit payment and local hotel 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 800 643-9504 • E-mail: lorimill@iastate.edu

Online registration available at www.biotech.iastate.edu/ed_resources/regis_form_summer2013.html



Publicity/Image/Voice Permission

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About the ISU Public Education Program in Biotechnology. . .

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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

Public Education Program Personnel

James Reecy, Professor of Animal Science and

Director of the Office of Biotechnology

Mike Zeller, Biotechnology Outreach Education Coordinator

Lori Miller, Program Secretary

Glenda Webber, Editor

Joel Nott, Assistant Scientist, and Camie Stockhausen, Communications Specialist, Homepage Webmasters