You are invited to attend one or more of the summer 2016 workshops

Iowa State University

O F S C I E N C E A N D T E C H N O L O G Y

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

It is with great pleasure that I invite you 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 Iowa State University 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.

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

Sincerely,
Mike Zeller
Biotechnology Outreach Education Coordinator

See page 2 for workshop and registration details
Iowa Biotech Opportunities

Biotechnology education workshops

Biotechnology Education Workshop I
Iowa State University, Ames
June 13-16, 2016

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, antibiotic resistance, and more. Educators will prepare and perform the lab protocols as the students would do in class.

Credits
- 2 professional development credits – for $25
- 2 ISU graduate credits – cost to be announced

Stipend
- $200 stipend for Iowa teachers ($50 per day) funded by the Iowa Biotechnology Association

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

Registration deadline
June 1, 2016

Biotechnology Education Workshop II
Iowa State University, Ames
June 27-30, 2016

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.

Credits
- 2 professional development credits – for $25
- 2 ISU graduate credits – cost to be announced

Stipend
- $200 stipend for Iowa teachers ($50 per day) funded by the Iowa Biotechnology Association

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

Registration deadline
June 1, 2016

Bioethics workshop

Bioethics Workshop I
Iowa State University, Ames
June 20-23, 2016

This course is designed for educators who want to incorporate discussion of ethical issues into existing science courses. Participants will create case studies designed to integrate ethical content in the science curriculum, and which might also be used to address such issues for extension audiences. The focus will be on ethical issues in science education, including especially agricultural biotechnology. Several other bioethics topics will also be covered.

Participants will work through activities and case studies that they can take home and use in their classes. During the workshop, participants will be divided into groups. Each group will develop a study on a topic relevant to students who take their classes.

The workshop will also address some 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. Participants will leave with classroom-ready case study exercises for use in their own classes.

Credits
- 2 professional development credits – for $25
- 2 ISU graduate credits – cost to be announced

Stipend
- $200 stipend for Iowa teachers ($50 per day)

Questions? Contact Mike Zeller, 800 643-9504 or mzeller@iastate.edu

Stipends for the two biotechnology education workshops generously were provided by the Iowa Biotechnology Association.
Iowa Biotech Opportunities

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

Registration deadline
June 1, 2016

Questions? Contact Clark Wolf at 515 294-3068 or e-mail jwcwolf@iastate.edu.

Summer research internship for 8-12 grade science teachers

Iowa State University is offering 8-12 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 13 – July 29, 2016, (contingent on unforeseeable snow days!).

No prior biotechnology training is necessary to be accepted into this program. Teachers will be introduced to the process of scientific research by conducting a small independent project under the supervision and mentorship of ISU faculty and staff. Teachers will be provided with the tools, experiences, and on-going relationships with career scientists and with fellow teachers that will enable them to share with their high school students the latest developments in biotechnology and inspire their students with a desire to learn more about this field of science.

The internship program is supported by the National Science Foundation and U.S. Department of Agriculture, and stipends of $6,300 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 their travel expenses.

For further details, please visit www.cbirc.iastate.edu/education/precollege/ret/ or contact program director Dr. Adah Leshem at 515 294-8453 or e-mail her at adah@iastate.edu. The application deadline is March 1, 2016, however applicants will be reviewed on a rolling basis. Placements will be made by the end of March 2016.

Summer academy on biorenewables for middle school science teachers

Iowa State University is offering middle school science teachers the opportunity to participate in professional development workshops to study the methods of biomass utilization to produce biorenewable products, including biofuels and biomaterials. The Summer Academy for middle school teachers will be held on the Iowa State campus in Ames from June 27 – July 17, 2016, and July 28, 2016. 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 science standards and benchmarks.

The Summer Academy 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.

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 due March 1, 2016. Placements will be made by the end of March 2016.
Iowa Biotech Expertise

Mike’s message . . .

By Mike Zeller
Biotechnology Outreach Education Coordinator

This Winter’s 2016 edition of the Iowa Biotech Educator serves to officially invite you and your colleagues to attend our summer Biotechnology Education Workshops. Dates and specific information about each individual workshop, including how to register, can be found on page 2.

The workshops offer you a chance to experience the most modern STEM techniques and concepts in life sciences. After completing a workshop(s), you will be eligible for free equipment and supplies.

Please share this issue with your colleagues and/or direct them to our website so they, too, can benefit from the resources the Biotechnology Outreach Education Center (BOEC) can offer educators.

Newsletter delivery changing

This edition also marks the last newsletter that will be sent out and available in hard copy. Beginning with the Spring 2016 edition, all future newsletters will be available/sent to you in digital form.

To ensure you receive future editions, make sure we have your e-mail address. Please contact us to confirm e-mail addresses so you don’t miss any editions. E-mail either Lori Miller at lorimill@iastate.edu or me at mzeller@iastate.edu to confirm.

As always, all newsletters can be found on the Iowa State Office of Biotechnology’s website at www.biotech.iastate.edu.

BOEC is here to help

I want to remind you that the BOEC is here to help you enhance your STEM initiatives in life sciences with biotechnology resources. Just contact Lori Miller or me anytime to order supplies or equipment, to schedule a visit to the BOEC or your classroom, and/or to have your questions answered.

I have arranged my schedule so that most days I am exclusively available from 7-8:30 a.m. weekdays, except when I travel.

This fall, I was kept busy teaching Iowa State pre-service teachers from agricultural education, family and consumer sciences, and the Master of Arts in Teaching (M.A.T.) degree program, while still presenting to school groups either in the BOEC or at Iowa schools.

Typically, the demand for the BOEC outreach services is very high in the spring. 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.

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

Make spring plans early

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.

Focus on Ag

Energy and agriculture

www.agfoundation.org/resources/energy-resources

The American Farm Bureau Foundation for Agriculture is providing free lesson plans and units for middle school and high school students to help them explore energy and agriculture. The Energy and Agriculture units provide comprehensive lesson plans and supporting resources based on Next Generation Science Standards.

The middle school unit has five lessons to help students learn about energy around us, energy input and food production, energy distribution, energy-related careers, and decision making involving multiple energy-use options in agricultural scenarios.

High school students can explore energy flow, trace the energy used to produce a commodity, compare and analyze renewable energy resources, determine the energy released from biodiesel, and evaluate the renewable energy strategies of individual farms.

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Editor

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**Iowa Biotech Competitions**

Major award programs for which Iowa science educators or their students are eligible are featured below. For other award, competition, and grant opportunities for educators or students, visit the Office of Biotechnology's educational funding website at www.biotech.iastate.edu/educational-awards-and-funding-sources/.

**State Science and Technology Fair Mar. 31 - Apr. 1**

The 2016 State Science and Technology Fair of Iowa (SSTFI) will be held in Ames on Thursday and Friday, March 31 - April 1.

The SSTFI has split into two separate, simultaneous events, a senior high event and a junior high event. The fair is open to any student in the state of Iowa in grades six through twelve.

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 Iowa high school students who exhibit top-level projects at the fair are eligible for the IowaBio 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 2015 winners were Micaela Bryant, Central Lee High School, Donnellson; Eric Koehlmoos, South O'Brien High School, Paullina; Rachel Mehmert, Holy Trinity Catholic Junior/Senior High School, Ft. Madison; Manasa Pagadala, Rivermont Collegiate, Bettendorf; and Abby Walling, West High School, Iowa City.

In addition to the five IowaBio scholarships, the Association is working with the Biotechnology Institute, an educational foundation headquartered in Washington D.C., to award two BioGENEius scholarships. BioGENEius scholarship winners will compete at the national BioGENEius challenge in San Francisco next summer.

For more information about the SSTFI, visit www.sciencefairofiaowa.org or contact board chair Jay Staker, e-mail jstaker@iastate.edu.

Volunteers are being recruited to judge at this year's event. For details, contact Vicki Speake, e-mail speake@iastate.edu.

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**Ames Lab / Iowa State host science bowls**

**The Iowa Regional High School Science Bowl**

Hosted by the U.S. Department of Energy's Ames Laboratory and Iowa State University, this year's Iowa Regional High School Science Bowl is scheduled for Saturday, January 23, 2016, on the Iowa State University campus in Ames.

During the competition, teams of four students, plus one alternate, answer questions from categories such as biology, chemistry, mathematics, physics, earth and space sciences, and energy. The regional winning team is awarded an all-expenses-paid trip to compete in the Department of Energy's National Science Bowl® in Washington, D.C., from April 28 - May 2, 2016. The 2015 champion of the Regional High School Science Bowl was West Des Moines Valley High School.

**The Iowa Regional Middle School Science Bowl**

The science bowl for grades 6-8 will be Saturday, February 20, 2016, on the Iowa State University campus in Ames. This event also is hosted by the U.S. Department of Energy's Ames Laboratory and Iowa State University. Participants will compete in a question-and-answer contest about life science, physical science, earth and space science, energy, mathematics, and general science. The winning academic team of the 2016 competition will receive an all-expenses-paid trip to the National Middle School Science Bowl® in Washington, D.C., to compete from April 28 - May 2, 2016. Ames Middle School was the champion in the 2015 Middle School Science Bowl.

For more information

To learn more about the science bowls, go to https://www.ameslab.gov/education/science-bowl or contact Deb Samuelson at 515 294-9557, debsam@ameslab.gov, or Steve Karsjen at 515 294-5643, karsjen@ameslab.gov.
**Iowa Biotech Competitions**

**Don’t forget to complete your application for the 2016 I.O.W.A. STEM Teacher Award!**

If you were nominated for the 2016 I.O.W.A. STEM Teacher Award sponsored by Kemin Industries, don’t forget to complete your application at [www.stemaward.fluidreview.com](http://www.stemaward.fluidreview.com). Six licensed, full-time, K-12 teachers will be selected from each of the six STEM regions for a prize of $1,500 for their classroom and $1,500 for their use. Awardees will be recognized at a formal ceremony hosted by Gov. Branstad. Applications are due Friday, January 22, 2016, at midnight.

**Nominations open February 1 for excellence in science teaching awards**

On February 1, administrators, colleagues, or teachers themselves can begin nominating outstanding science teachers in Iowa's K-12 schools for one of the 2017 Excellence in Science Teaching Awards offered by the Iowa Academy of Science. The deadline for completed application packets is January 31, 2017.

Iowa teachers of all grade levels in all science areas are eligible to be nominated in one of the seven nomination categories: elementary science, earth/space science/environmental science, general/multiple science, life science, middle school/junior high science, physical science, and science supervisory. For details, e-mail iascience@uni.edu or visit the website at [www.scienceiniowa.org/esta-current-awards](http://www.scienceiniowa.org/esta-current-awards).

**March 15 deadline for biology teacher awards**

Biology teachers have until March 15 to nominate a colleague or themselves for this year’s Outstanding Biology Teacher Award, sponsored by the National Association of Biology Teachers (NABT). Nominees are judged on their teaching ability and experience, cooperativeness in the school and community, inventiveness, initiative, and student-teacher relationships.

Please take the time to nominate a deserving colleague or yourself. Nomination instructions can be found in the Awards and Opportunities section of the NABT website at [www.nabt.org](http://www.nabt.org). The deadline for 2016 nominations is March 15, 2016.

For more information, contact Iowa's directors for the award Mike Zeller, mzeller@iastate.edu, or Doug Herman, herman.doug@iccsd.k12.ia.us.

**Newsletter News**

**Future issues of this newsletter by e-mail**

Future issues of the *Iowa Biotech Educator* will be delivered to you by e-mail only.

If you have been receiving your copy through the U.S. Postal Service, you will not receive future issues unless you send us an e-mail address where you want to receive them.

The e-mail address should be sent to Lori Miller, lormill@iastate.edu. It would help Lori if you could use “E-mail for Newsletter” in the subject line of your message.

**Why e-mail only?**

The Office of Biotechnology is trying to conserve natural resources and spend its limited funds wisely. As the cost of printing and paper rises, delivering the *Iowa Biotech Educator* as an electronic publication makes sense.

**What will I receive if I choose an e-mail subscription?**

If you decide to continue your free subscription to the *Iowa Biotech Educator*, you will receive an e-mail that will have the newsletter attached to it as a PDF file. The PDF newsletter can be opened with Adobe Reader, free software that many people already have on their computers or it can be downloaded at [www.adobe.com](http://www.adobe.com).

**Do I have any other options?**

You can find all the current and past issues of the *Iowa Biotech Educator* on the Office of Biotechnology website at [www.biotech.iastate.edu/iowa-biotech-educator-newsletter](http://www.biotech.iastate.edu/iowa-biotech-educator-newsletter).

Future issues on our website will be in the same PDF format as the issues that are distributed by e-mail.
**Iowa STEM Competitions**

**April 1 and May 1 deadlines for presidential awards**

April 1 is the deadline for online nominations of math and science teachers of grades K-6 for a Presidential Award for Excellence in Mathematics and Science Teaching. May 1 is the deadline for nominated teachers to prepare their applications. This award is the highest recognition that a mathematics or science teacher in the United States can receive and is presented in Washington, D.C.

The competition alternates each year between teachers of grades K-6 and teachers of grades 7-12. Up to two winners in mathematics or science are named from each state or jurisdiction. For details, e-mail info@paemst.org or visit www.paemst.org.

Congratulations to mathematics teachers Allysen Lovstuen, Decorah High School, and Brian Reece, Central Academy, Des Moines, who were announced as Iowa’s two winners last summer. Congratulations also to the next round of finalists for the award, mathematics teachers Rick Brooks, Johnston High School, and Curtis Martinek, Gilbert High School, and science teachers Lynne Bleeker, Parkview Middle School, Ankeny; Shannon Harrison McLaughlin, Norwalk High School; and Alicia D. Schiller, Central Lee High School, Donnellson.

**In the News**

**BOEC featured in Iowa State news publications**

Iowa State’s Biotechnology Outreach Education Center (BOEC) coordinated by Mike Zeller with support from Lori Miller was featured in three news items distributed by the university in the past few months.

Last summer, an Alliance for Iowa State article provided an overview of the BOEC’s pioneering efforts in STEM education and its current K-14 initiatives, including free lab equipment and supplies, summer workshops, and pre-service coursework for tomorrow’s teachers. View this article at http://archive.constantcontact.com/fs129/1111749662211/archive/1121273261159.html.

Another Alliance for Iowa State article in the fall focused more attention on the free equipment and supplies provided to trained Iowa teachers for 22 years (and counting), along with the field trips to the BOEC and free on-site visits to schools. Read it at http://archive.constantcontact.com/fs129/1111749662211/archive/1121273385330.html.

Also in the fall, an article about how the BOEC’s outreach program is helping to inspire new generations of bioscientists appeared in the student adventure section of the Office of the President’s Destination 2050 website. A Johnston high school teacher and a former Central Lee High School (Donnellson) student now thriving at Iowa State who both benefitted from the BOEC’s outreach are featured in the article. Read what they said at www.destination2050.iastate.edu/iowa-state-program-inspires-new-generations-bioscientists/.

**Iowa Biotech Resources**

**Top 10 biotechnology discoveries for 2015**
http://hudsonalpha.org/

Educators looking for an easy way to stay up-to-date on new discoveries in genetics, genomics, and biotechnology should check out the Education section of the HudsonAlpha Institute of Biology. This non-profit institute located in Huntsville, Alabama, publishes an annual Biotechnology Guidebook describing new research discoveries. The guidebook can be downloaded as a free PDF file.

Although the articles are linked to the Alabama Course of Study for courses in high school biology, environmental science, forensics science, genetics, AP biology, health, career and technical education, and more, the guidebook authors say they can be integrated with similar course objectives from other states and systems.
About Iowa State’s Public Education Program in Biotechnology. . .

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