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 curricula 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
Iowa Biotech Opportunities

Biotechnology education workshops

Biotechnology Education Workshop I  
Iowa State University, Ames  
June 8-11, 2015

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

Credits
• 2 professional development credits for $25
• 1-2 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
May 26, 2015

To register for any workshop, contact Lori Miller (800 643-9504, lorimill@iastate.edu) or register online at www.biotech.iastate.edu/summer-training-courses-for-educators.

Bioethics Workshop I  
Iowa State University, Ames  
June 15-18, 2015

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 agricultural biotechnology. 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
May 26, 2015

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

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 8 – July 24, 2015 (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 $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.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, 2015. Placements will be made by the end of March 2015.

Summer Academy on biorenewables for middle and high school science teachers

Iowa State University is offering middle and high 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 29 – July 17, 2015. The Summer Academy for high school teachers will be held on the Iowa State University campus from June 15 – June 26, 2015. 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.

The Summer Academy is supported by the National Science Foundation. Stipends of $800/week 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 on-campus housing 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 due March 1, 2015. Placements will be made by the end of March 2015.
Iowa Biotech Expertise

Mike’s message . . .

This Winter 2015 edition of the Iowa Biotech Educator officially invites you and your colleagues to attend one or more of our summer Biotechnology Education Workshops (p. 1) and announces the dates and information about each individual workshop, including how to register (p. 2).

You can find the 2015 summer workshops information and registration form on our website at www.biotech.iastate.edu/summer-training-registration/.

Newsletter changes coming

This newsletter is 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 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.

Remember, the newsletter will gradually move to a digital format starting with the Spring and Fall 2015 editions and go completely to digital delivery in Spring 2016. Please contact us to confirm your e-mail address so you don’t miss any editions. Phone us at the toll free number 800 643-9504 or e-mail lorimill@iastate.edu or mzeller@iastate.edu.

Help when you need it

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.

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 Masters of Art in Applied Teaching (MAT) degree program, while still presenting to 31 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.

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 Iowa State University campus in Ames.

It is always exciting to visit with Iowa teachers who are searching for ways to bring biotechnology and the most modern life sciences STEM initiatives and teaching methods into their classrooms.

I also attended the National Association of Biology Teachers (NABT) convention in Cleveland, Ohio. 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 knowledge, 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.

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Have a great spring semester.
The Journey of a Gene
http://passel.unl.edu/ge

The Journey of a Gene is one of the genetic engineering lessons found in the Plant and Soil Sciences eLibrary. Begun in 1999, the eLibrary project is supported in part by grants from the USDA National Institute of Food and Agriculture and the National Science Foundation.

Hosted by the University of Nebraska (UNL), The Journey of a Gene presents the four steps of genetic engineering needed to produce soybeans that are resistant to Soybean Sudden Death Syndrome. To begin the lesson, students learn about the impact of the disease from a video featuring Iowa State University scientists and agricultural producers.

Step 1 is designing the gene. In this section, students view the learning objectives and then proceed through lessons on the basics of DNA, the nature of a gene, and gene regions. An animation lets students practice designing a transgene, followed by an in-the-lab video of Iowa State University agronomy professor Madan Bhattacharyya explaining the genetic engineering process. This section ends with a quiz. Students can e-mail the quiz results to their instructor.

Step 2 is transformation. Topics in this section include gene delivery, an animation that allows students to practice inserting a gene, an in-the-lab video of a UNL plant transformation specialist, and a transformation quiz.

The Step 3 section on plant breeding gives students an interactive animation on flower anatomy. Videos of UNL plant breeders explain how soybeans are crossed and backcrossed. A video about Punnett squares is followed by an in-the-field video on how to get the transgene into the best plant. A plant breeding quiz closes this section.

The final Step 4 section helps students understand how DNA testing and gel electrophoresis are used in genetic engineering. Students learn by watching animations that explain DNA extraction, polymerase chain reaction (PCR), and gel electrophoresis. A video of a DNA analyst shows students how these three processes help identify which plants that were backcrossed actually received the SDS-resistant transgene. Students test their progress by a quiz on DNA testing.

In addition to the four sections in the main lesson, students can access a risks and benefits area of the website that discusses how food scientists can evaluate the safety of genetically engineered crops. Allergens in the body, food safety testing, and government regulation all are explored. Advocate and skeptic sections contain videos of people presenting their views, both pro and con, about genetic engineering and food crops.

For the students who like a challenge, a Test Your Knowledge feature presents the previous year’s Nebraska State FFA Biotechnology Contest. Virtual flashcards and a small group classroom activity are included.

Iowa Biotech Competitions

New STEM Education Award launched

The Iowa Governor’s STEM Advisory Council and Kemin Industries have initiated a new award program called the STEM Education Award for Inspired Teaching. The award recognizes one teacher from each of the six STEM regions for their dedication and contributions to science, technology, engineering, and math (STEM) education for Iowa’s K-12 students. Each winner receives a $1,500 award and an additional $1,500 to be used in the classroom.

The six regional winners of the award will be announced at the STEM Statewide Conference in March 2015. To learn more about the award or to find out how to nominate teachers for the 2016 award, watch the website at www.stemaward.fluidreview.com. Anyone can submit a nomination, and all certified K-12 teachers in the state of Iowa who teach a STEM subject are eligible to win.

The Iowa Governor’s STEM Advisory Council, an initiative created by Governor Terry Branstad in 2011, is co-chaired by Lieutenant Governor Kim Reynolds and Vermeer Corporation President and CEO Mary Andringa. With bipartisan support from the Iowa Legislature, the initiative ensures that Iowa youth will be offered STEM programs to increase interest and achievement in STEM fields and prepare Iowa’s future workforce. For more information, please visit www.IowaSTEM.gov.

The STEM Education Award for Inspired Teaching is sponsored by Kemin Industries, a global molecular science company that develops and manufactures more than 500 specialty food ingredients to improve animal and human nutrition and health. Founded in Des Moines in 1961, Kemin is a strong advocate for STEM education in Iowa. Learn more at www.kemin.com.
Iowa Biotech Competitions

State Science and Technology Fair March 26-27

The 2015 State Science and Technology Fair of Iowa (SSTFI) will be held in Ames on Thursday and Friday, March 26-27. 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 two individuals, the top team project, and their teachers will be awarded trips to the Intel International Science and Engineering Fair in Pittsburgh, Pennsylvania, in May. All exhibitors in grades 6-12 are eligible for prizes and other special awards.

As one of the fair sponsors, the Iowa Biotechnology Association (IowaBio) will be making five scholarship awards at the 2015 fair. The IowaBio 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 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 2014 winners were Kelsey Bryant, Central Lee High School, Donnellson; Taylor Dunn and Malorie Maerz, Keokuk High School, Keokuk; Breanna Kramer, Central Lee High School, Donnellson; and Abby Walling, West Senior High School, Iowa City.

In addition to the five IowaBio scholarships, the Association is working in coordination with the Biotechnology Institute to award two BioGENEius scholarships. These scholarships will qualify the students to compete at the national BioGENEius challenge in Philadelphia next summer. Additional details will be announced by IowaBio in 2015.

For more information, visit www.scienc faireofiowa.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, e-mail Vicki Speake, speake@iastate.edu.

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 24, 2015, 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 30 - May 4, 2015. The 2014 champion of the Regional High School Science Bowl was Ames High School.

The Iowa Regional Middle School Science Bowl
The science bowl for grades 6-8 will be Saturday, February 21, 2015, 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 2015 competition will receive an all-expenses-paid trip to the National Middle School Science Bowl® in Washington, D.C., to compete from April 30 - May 4, 2015. Ames Middle School was the champion in the 2014 Middle School Science Bowl.

For more information
To learn more about the science bowls, visit 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.
Nominations open February 1 for awards honoring excellence in science teaching

On February 1, administrators, colleagues, or teachers themselves can begin nominating outstanding science teachers in Iowa’s K-12 schools for one of this year’s Excellence in Science Teaching Awards.

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.iacad.org/recognize.html.

March 15 deadline for outstanding 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. To nominate a colleague or yourself, follow the instructions found in the Awards and Opportunities section of the NABT website at www.nabt.org before the March 15 deadline.

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

April 1 and May 1 deadlines for presidential awards

April 1 is the deadline for online nominations of math and science teachers of grades 7-12 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. For details, e-mail info@paemst.org or visit the website at www.paemst.org.

For other award, competition, or grant opportunities for educators or students, visit the Office of Biotechnology’s educational funding website:

www.biotech.iastate.edu/educational-awards-and-funding-sources
Iowa State University’s Public Education Program in Biotechnology thanks donors for their generous support:
Sustaining donor: Iowa Biotechnology Association
Major donors: 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 Farm Bureau Federation Agricultural Foundation; the Iowa Soybean Promotion Board; Iowa State University Extension and Outreach; 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
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