Mike Zeller is Iowa State University's biotechnology outreach education coordinator.

Employed by the university's Office of Biotechnology, he coordinates activities offered through the Biotechnology Outreach Education Center that help Iowans understand the science underlying 21st century biotechnology developments and the associated economic, ethical, and social issues.

In addition to the training and educational experiences that can be provided in the center, the coordinator facilitates education throughout the state by:

- providing Iowa teachers and extension educators with free laboratory supplies and materials to conduct biotechnology science and ethics activities,
- developing and conducting biotechnology and bioethics activities and teacher training on-site at schools or extension offices,
- providing answers to questions and problems that students and teachers may encounter while doing biotechnology activities in the classroom,
- assisting teachers in implementing biotechnology science and bioethics activities in the curriculum,
- helping teachers establish benchmarks and standards as they relate to biotechnology and bioethics in their school/curriculum, and
- speaking to community groups, organizations, and other public audiences about the general principles and current issues of biotechnology science and ethics.

Educators, students, the public, or industry can contact Mike Zeller at:

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The center was funded by Iowa State University, private individuals, and:

- 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 Agricultural 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

Many of the resources provided by the Biotechnology Outreach Education Center are available from the educational resources section of the Office of Biotechnology's site or the university's bioethics web site.

www.biotech.iastate.edu/Educational_resources.html
- Step-by-step tutorials for selected lab activities (PowerPoint® and HTML versions)
- Classroom lab activities
- Summer workshop information
- How to get equipment and supplies
- Resource people who can help
- Biotechnology curriculum units
- Links for current news in biotechnology
- ISU Extension information
- Biotechnology courses and workshops
- Conferences and symposia
- Educational funding opportunities
- Publications
- Web resources

www.bioethics.iastate.edu/outreach.html
- Introduction to ethics
- Bioethics workshops
- Classroom resources and case studies
- Events and courses
- Research ethics
- Bioethics news
- Web resources

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The Biotechnology Outreach Education Center offers hands-on laboratory experiences and bioethics activities for students from elementary through college age and adults. Teachers and extension educators may consult with Iowa State's outreach education coordinator to develop a unique educational experience for their students, or select from the list of experiments and activities below.

Students can visit the center for an hour or two as part of a field trip or participate in multiple-day workshops. College instructors preparing students for teaching careers in agriculture, biology, or family and consumer sciences have made the center part of their pre-service programs.

**Experiments and Activities**
- Bioethics golden rice case study
- Bt corn
- growing and observing resistance to corn borers - testing for Bt in leaf tissue and seed
- Chymosin demonstration
- DNA extraction - bacteria, banana, kiwi, onion, fruit cup - DNA in my food – making of a smoothie
- DNA fingerprinting
- DNA transformation of bacteria - ampicillin resistant - red colony - recombinant – dual antibiotic resistant genes
- Plasmid DNA isolation and analysis – red colony
- Polymerase chain reaction activity and simulations
- Soy drink
- Soybean flavor demonstration
- Thin-layer chromatography or invertase to detect sucrose in soybeans

For the most recent experiments, see the web page at www.biotech.iastate.edu/Educational_resources.html.