



What is biotechnology?

- Biotechnology uses life forms or processes to solve a problem or make a product.

What is bioinformatics?

- Bioinformatics is the use of computers to store, retrieve, analyze or predict the composition or structure of biologically important molecules.

BBDisccovery! Happenings

Biotechnology/ Bioinformatics Discovery



Summer Teachers Workshops Successful

Three biotechnology teacher training workshops were offered at OKCCC this summer.

The focus of the July 19-23 and August 2-6 “**Foundations Workshop**” was helping teachers develop and increase the use of biotechnology in their science classrooms. During the **Foundations Workshop**, teachers explored the world of biotechnology and its many roles in today's world. Teachers used nationally developed biotechnology activities that met both PASS and NSES standards and promoted inquiry. Teachers practiced 10 biotechnology wet labs that will be provided throughout the upcoming school year by OKCCC's BBDisccovery grant. They received templates, student worksheets and answer keys to many desktop activities that reinforced biotechnology concepts. Participating teachers who joined this project will obtain continued support throughout the school year in the form of ready-to-go kits of biotechnology activities complete with equipment and supplies, in-class assistance from grant personnel, and paid professional development. Both AP molecular biology labs are included in the project package as well. See page 2 for a listing of schools and teachers who attended.

The **Advanced Topics Workshop** was held August 9-13 for teachers who had previously completed a BBDisccovery summer workshop. The goal is to assist teachers who will teach a full year biotechnology course. **Advanced topics** involved activities that can be used directly in the classroom. Modules presented included desktop activities, exploring emerging issues in biotechnology, extended wet labs (with an inquiry component), use of bioinformatics, developing bioethics discussions with students, and an introduction to guest speakers available for the classroom. Teachers were actively involved in sessions on grant writing, making poster and electronic presentations and developing a syllabus for high school biotech programs. Everyone left with ready to use classroom products to take back for use this Fall semester! See page 2 for a listing of schools and teachers who participated in the Advanced Topics workshop.

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BBDiscovery Foundations Workshop: July 19-23 and August 2-9

A variety of school districts were represented by the following teachers:

Del City HS:

Jennifer Beggs
Renee Bell
Marsha Howard
Katherine Lopez

Douglass HS:

DeniseBaccus-Bowie
Delora Mowery

Independence Charter School:

Vickie Allred

Jackson Middle School:

Jennifer Lynch

John Marshall:

Sandra Segabart

Mid-Del Schools:

Gaile Loving — science coordinator

Midwest City HS:

Kristi Redding

Minco:

Ken Bodley

Northeast Academy:

Matt Adrian

Oklahoma Christian School:

Dave Holder

Putnam City :

Susan Baker
Stephen Stark

Santa Fe South Charter School:

Lonnie James
Jana Jean
Adrian Savedra

US Grant:

Warren Habr

Westmoore High School:

Kristi Adams,
Jeffrey Baughman

Yukon:

Shane Lewis
Christine Mollet
Misty Williams

Advanced Topics Participants: August 9-13th

The following schools and teachers participated.

Ardmore-

Julie Appel

Northwest Classen-

Cindy Haney

Douglass-

Barbara Burton

Southeast-

Sandra McKinney

John Marshall-

Lulla Wilson

Star Spencer-

Jane White

Northeast Academy-

Bessie Bryant

Western Heights—

Chet & Danita Hundley



Foundations Photo Gallery



Gaile, Jennifer, and Lonnie



Christine and Misty



Carla, Ken and Marsha



Shane



Delora and Sandra



Jeffrey, Adrian and Denise

Advanced Topics Workshop

Four high school biotech classes were established in Oklahoma City Public Schools during the 2003-2004 school year. Participating schools were Douglass, John Marshall, North West Classen and Star Spencer. During the upcoming 2004-2005 school term seven schools are slated to institute full year biotech classes.

Teachers from last year's pilot biotech classes were brought together in August for an Advanced Topics Workshop. The workshop resulted in the development of a syllabus for a High School Biotech Program, a plan for implementing such a program in other schools, and provided teachers the opportunity to share their classroom experiences. Each teacher produced an online activity that is available on the internet for use by biotech teachers nationwide. Teachers revisited existing lab activities and extended them by developed inquiry components. Additionally they reviewed new lab experiences that will be incorporated in their high school program.

Advanced Topics Workshop teachers also developed plans for implementing activities this school year in their classrooms and formulated plans to serve as "Lead Teachers" in their schools. As a lead teacher their goal is to promote inclusion of biomedicine and biotechnology in other high school classrooms. They will assist biology and chemistry teachers with inclusion of biotech activities in entry level classes and serve as the foundation for information about biotechnology in their school. The overall goal is to promote science, specifically biotechnology at the high school level.

A focal point of the Advanced Workshop was the introduction of bioinformatics activities. Teachers worked through several tutorials and were presented with cutting edge bioinformatics information from the National Institutes for Health (NIH). Specifically, teachers practiced maneuvering through the National Human Genome Project website. They will then incorporate information from the Human Genome Project into their classes. Likewise teachers received extensive curriculum programs from both the Department of Energy and the NIH. Bioinformatics combines the latest discoveries from biotechnology and computers to store, retrieve, and analyze the immense amount of data that is being collected by scientists worldwide. The emerging field of bioinformatics is probably the fastest growing and most "in demand" area in science worldwide. Getting Oklahoma high school students acquainted with these kinds of material puts them far in advance of students nationwide.



Bessie, Lulla and Sandra



Chet and Danita



Don and Jane

Professional Development Opportunities Keep Teachers Busy

Many of the BBDISCOVERY teachers learned new biotechnology skills and honed old ones at the many summer workshops offered.

June 4-7 Bessie Bryant attended the BIO 2004 Teacher –Leader Program in San Francisco. Participants were from all areas of education from high school, community college and university. The conference gave educators an opportunity to interact and network to learn about the various programs being implemented concerning the field of biotechnology. Also during this time, Bessie along with Charlotte Mulvihill gave a presentation on increasing student diversity in biotechnology programs. Additionally Don Bell attended the BIO conference as a Bio-Links fellow.

Also in June, Lulla Wilson and Jane White attended a week long biotechnology workshop sponsored by Langston University. As a result of their attendance, they will receive biotechnology equipment for their classroom.

In July Lulla Wilson and Bessie Bryant attended a week long “protein purification” workshop at University of Texas- Austin.

On August 2nd, Julie Appel and Teresa Randall gave biotechnology presentations at the Oklahoma State Department of Education’s annual curriculum and assessment conference. The first presentation was “Desktop Biotech Activities” and the second was “Boffo Biotech Internet Sites”.

Also in August Bessie Bryant and Jennifer Lynch attended an OSBI workshop for teachers. The focus was to help teachers develop a greater understanding of forensic science and the process of gathering information in criminal investigations. Teachers were provided with a notebook of activities that could be utilized in the classroom. OSBI has opened their doors to the public to help teachers address the interest and curiosity that students have in science.

Upcoming Professional Development Opportunities

- **Oklahoma Science Teachers Association Fall Conference**
CSI: Constructing Science Interest in Oklahoma
Thursday October 21, 2004
Fulton Academy, Tulsa Oklahoma
www.angelfire.com/ok3/osta
 - **SACNAS National Conference**
Science and Science Policy: Constructing an Inclusive Paradigm
October 21-24, 2004
Austin, TX
www.sacnas.org/index.html
 - **National Science Teachers Association National Convention**
2 strands: biomedical and biotechnology education
March 31 - April 3, 2005
Dallas, Texas
www.nsta.org/conventions
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BBDiscovery's purpose is to expand the pipeline of qualified high school students, especially underrepresented students, into the field of biotechnology. The strategy is to infuse high quality biotechnology experiences into the high schools.

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Summary of Project Goals

- To increase awareness about biotechnology and its role in biomedical research.
- To improve student success in science, especially among the underrepresented groups.
- To support and enhance the quality of science teaching in participating schools.
- To make an impact on the Oklahoma biotechnology workforce and industry.
- To improve science literacy.

Visit us on the web!
www.okccc.edu/bbdiscovery

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Partnered with Oklahoma City Community College.