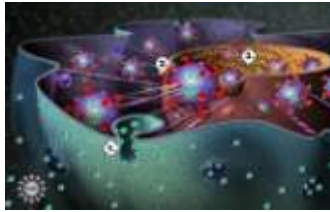




## The SDS Biotechnology PAGE

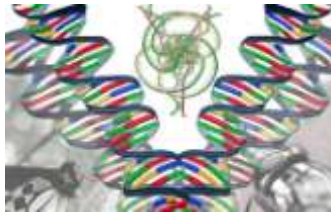
### SPRING 2010

Welcome to the Spring 2010 newsletter for the Tulsa Community College Biotechnology Program and participants in the Stimulating Enthusiasm, Exploration and Discovery in Biotechnology Education (SEEDBED) NSF-ATE Grant, and Medicines, Explorations, and Discoveries in Biotechnology Education (MEDBED), the NIH supplemental grant! This newsletter is an excellent way to communicate with all who support and participate in our programs.



### Milestones this Spring Include:

- Our High School Biotechnology Extravaganza was a huge success this March 5, 2010. Please see more detailed information in this newsletter.
- Numerous TCC Biotechnology students have been awarded scholarships and internships this spring. Other applications have been submitted!
- TCC Biotechnology Students in the Molecular Biology and Techniques class presented research posters during the Fall 2009 and Spring 2010 semesters.
- Read these pages to learn how TCC Biotechnology has been connecting with the scientific community through Oklahoma State Teachers Association (OSTA), the Tulsa Area Bioscience Education and Research Consortium (TABERC) and Oklahoma University-Tulsa Community Engagement Center Vision (OUCEC).
- This spring we began active workshops through the \$.5M NIH INBRE grant as part of the National Center for Research Resources through the American Recovery and Reinvestment Act. The new grant Medicines, Explorations, and Discoveries in Biotechnology Education (MEDBED) enhances work begun with the SEEDBED project. This spring we have had four successful MEDBED academies. A detailed narrative is included in this newsletter.
- TCC hosted Sam Rhine, genetics educator on November 30, 2009 in the Performing Arts Center for Education (PACE). Approximately 300 area high school students and their teachers attended the presentation. Dr. Diana Spencer was able to welcome the students and Sam Rhine with a short presentation of the biotechnology programs available at TCC.
- The NSF Scholarship in Science, Technology, Engineering, and Mathematics (S-STEM) Preparing for Innovation Producing Educated STEMS Scholars (PIPESTEMS) grant accepted the first applications this spring. TCC Biotechnology students submitted several applications. These scholarship dollars for high achieving and low funded students is an excellent opportunity. Several students took the Residual ACT at the TCC NEC in order to submit their applications. Good luck biotechies!
- Work continues in the development of articulation agreements with four year academic institutions. Several fruitful meetings have occurred this semester with Northeastern State University/ BA.
- Diana Spencer was awarded a fellowship to the Bio-Link's Summer Fellows Forum 2010: "Connecting Bio-Link to Vision and Change." The program is held at the Clark Kerr Campus in Berkeley, California. Diana will present *Biotechnology Secondary Outreach and Recruitment: Activities and Techniques*.



## **Sticky Ends (Biotechnology Student Progress):**

Through our new Consortium Agreement with the OU Health Science Center and the National Institute of Health, five TCC students, two of them biotechnology students, were awarded the IDeA Network of Biomedical Research Excellence (INBRE) summer student paid internships. We are thrilled for the learning experiences ahead of these students. CONGRATULATIONS! to Duane Goins and Heather Hayes; Duane will be working in a research lab at the Oklahoma Medical Research Foundation in Oklahoma City, and Heather will be working in a research lab at Oklahoma State University Center for Health Sciences.

“CONGRATULATIONS!” to Duane Goins and Heather Hayes for earning The David Boos and Susan Cave Scholarship for Biotechnology Education at Tulsa Community College. The contribution came from Erma Spann, who is a former TCC Foundation Trustee. Ms. Spann created this scholarship in honor of her children, David Boos (pronounced Bowes) and Susan Cave.

The students in the Molecular Biology and Techniques class presented a poster presentation of their work on April 8, 2010 at the Oklahoma University Research Forum in the Learning Center on the OU Schusterman campus. The poster, *Determinative Phylogeography of Male Ancestry by Referencing the Human Y Chromosome*, was presented by Lindsey Allen, Heith Crosby, Jameson Phoenix, Armond Swift and Dr. Diana Spencer. This study was an extension of the work from the fall semester of 2009 and involved male chromosome DNA amplification of several genes. The study looked at the possibility of correlating migration patterns through participant self report of country of origin with gene marker amplification.

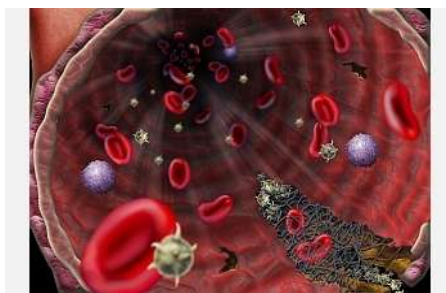
There was a sighting of Kelsy Thompson, first biotechnology graduate, while she was actively researching genes in mosquitoes during the field trip of the Molecular Biology and Techniques students to the OSU Protein and Microarray Core Labs!

In December of 2009, Susan Limekiller became the second Biotechnology AS graduate. She was immediately employed by the NSF SEEDBEEd grant to provide biotechnology outreach to the area secondary students.

Brandi Guenwald earned employment with the Tulsa Community College Southeast Campus Chemistry Department as a lab tech this month! Brandi loves the work.

We have two students on course to graduate this spring. Mona Easterling will graduate with as AS degrees, and she has several scholarship opportunities. Kelly Wisley will earn the Biotechnology Certificate. Kelly plans to continue her studies in a Masters Program at Kansas City University in Medicine and Biosciences.

Armond Swift was awarded the NSF SSTEM scholarship from OSU Stillwater! He plans to finish his AS degree this summer and continue his studies in Stillwater this fall. CONGRATULATIONS! Armond!



### **Making Solutions (Secondary Outreach):**

Oct 1, 2009, we met with two Union Public Schools Administrators, Richard Day, Charlie Bushyhead, and Union Intermediate teacher and past SEEDBED participant, Andrea Gaines. The discussion centered on the possibilities of creating a new learning space and new curriculum for biotechnology at the school. A most recent discussion involved the TCC biotechnology lab configuration as the Union Schools are looking at a new facility to include biotechnology classrooms.

The 4<sup>th</sup> annual **High School Student Biotechnology Learning Extravaganza** was held on Friday, March 5<sup>th</sup>, 2010. The goal of the Biotechnology Learning Extravaganza is to educate and excite students about biotechnology and to recruit students for the TCC Biotechnology program. A total of 105 high school students and 10 teachers were in attendance from the following Oklahoma high schools: East Central, Rogers, Tulsa Arts and Science, Broken Arrow, Memorial, Rogers, and Glenpool. Also in attendance for the featured speaker presentations were approximately 20 students from Tulsa Community College. Dr. Carol Messer, the TCC Southeast Campus Provost welcomed the students to the event. Next, Dr. Diana Spencer, TCC Biotechnology Coordinator, introduced the Biotechnology Program offered at TCC Southeast Campus. The featured speakers were Janice Joslin and J.D. Lindstrom from the Oklahoma State Bureau of Investigation, Northeast Regional Laboratory Forensic Biology Unit, and Dr. Valerie Fuller, formerly of the Tulsa Police Department Forensics Unit. Janice Joslin, OSBI Senior Criminalist, presented *Forensic DNA Analysis*, which offered students a glimpse into crime scene forensic evidence collection and subsequent analysis techniques used in the OSBI laboratory. J.D. Lindstrom, OSBI Criminalist Supervisor and CODIS State Administrator, presented *CODIS (Comined DNA Index System)*, a presentation that was an extension of Janice Joslin's talk about DNA collection and analysis. J.D. taught the students about the CODIS database that houses DNA profiles of convicted offenders. This system allows law enforcement to compare DNA profiles collected from unsolved crime scenes to profiles stored in the database. J.D. said that they get a match every week, meaning that an unsolved crime has been linked to a suspect. Dr Valerie Fuller's presentation, *My Adventures in Biotechnology*, educated the students about the career pathway leading to a job in Biotechnology. She also talked to the students about her time in Iraq, where she helped Iraqi police officers set up a DNA Forensics Lab. Following the presentations, the high school students attended a working lunch in which Matthew Mounger from TCC Enrollment Services and Academic Advisement, Joanne Tayrien from Financial Aid, and Aaron Ballinger from Student Recruitment, advised students about the application process, enrollment procedures and financial aid. High school students continued their biotechnology discovery with a rotation through five, hands-on laboratory activities including: DNA Extraction, Gel Loading, DNA Fragment Analysis, Fish Muscle Protein Gel Analysis, and Genomics to Proteomics. Volunteer TCC biotechnology students assisted the high school participants through the lab rotations.

During the spring months of 2010, TCC has introduced a total of 28 high school science teachers from 23 high schools to a number of advanced biotechnology activities during MEDBED (Medicines, Explorations and Discoveries in Biotechnology Education) Workshops at the Southeast Campus of Tulsa Community College. These workshops were taught by Diana Spencer, Ph.D., and she was assisted by MEDBED Project Specialists, Donna Kline and Donita Gray. Fifteen teachers representing 11 schools attended a seven hour MEDBED Workshop I on January 15, 2010. Those same teachers returned to the Southeast Campus on January

22, 2010 to participate in seven hours of MEDBEd Workshop II. Thirteen high school science teachers representing 12 schools attended a repeat of Workshop I and Workshop II on March 12, 2010 and March 26, 2010. All of the teachers represent schools that have high minority populations and are within a 60 mile radius of Tulsa. The January workshop participants included teachers from East Central High School, Glenpool High School, Locust Grove High School, Muskogee High School, Oaks Mission High School, Okmulgee High School, Paden High School, Will Rogers High School, Daniel Webster High School, Wilson High School, and Yale High School. These fifteen teachers have a total of 1,641 students that will be impacted by the MEDBEd training. The March workshop participants included teachers from Beggs High School, Catoosa School, Checotah High School, Chelsea High School, Copan High School, Edison High School, Keys High School, Morris High School, Porter High School, Shidler High School, Tulsa Technology Center and Booker T. Washington High School. These thirteen teachers together have a total of 1,387 students which will benefit from the MEDBEd training. Activities presented included studies of internet sites, wet labs, desk paper-pencil activities and computer bioinformatics labs. Wet lab activities included Size Exclusion Chromatography, ELISA (Enzyme Linked Immunospecific Assay), Analysis of Precut Lambda DNA, and DNA extraction from strawberries. All activities were aligned with the four national or state standards. Each school represented was given biotechnology equipment kits and reagents with an approximate value of \$4,000 to take back and use in their respective schools. A potential total of 3,028 students will be reached from these first four workshops. Also, the Project Specialists have visited six schools as of April 27, 2010 to help prep and/or teach various labs. Eight additional on site visits are scheduled before this semester comes to a close. Workshops I and II are also scheduled for the week of June 19<sup>th</sup>. Applications have been processed and 11 teachers from 10 schools are enrolled. In July, 2010, MEDBEd will offer an extension of training to teachers who have already attended the first two workshops. Workshops III and IV will cover various subjects including proteomics and polymerase chain reactions. Applications have been processed and 11 teachers from 10 schools are enrolled.

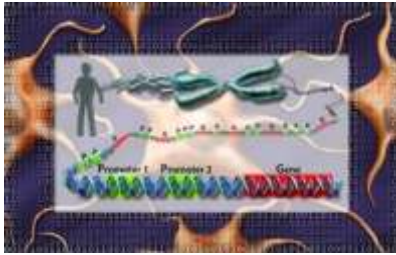
TCC Biotechnology was represented at the OSTA Fall Staff Development Conference *My Science: Connecting with 21<sup>st</sup> Century Students* on Saturday, November 7, 2009 at Howell Hall, University of Central Oklahoma in Edmond, Oklahoma. The OSTA Fall Conference was a time for the NIH INBRE group of educators to share. Mary Phillips presented *Infusing Biotechnology in Middle School Curricula* and Diana Spencer presented *Biotechnology: A Chance to Get Your Hands Dirty with DNA*. Through these presentations and other representatives of the INBRE faculty sharing with secondary teachers, we facilitated the learning of approximately 75 teachers that day.

On January 29, 2010, approximately 20 students from the Central Tech-Drumright campus attended a hands-on workshop in the TCC Biotechnology labs. Students were assisted by faculty, MEDBEd Specialists and SEEDBEd Project Assistants in four learning stations. Students were able to load agarose and polyacrylamide gels. They also got a chance to view fluorescent proteins.

As the Oklahoma INBRE Community College Coordinator, Diana Spencer presented to the INBRE External Advisory Board at the Oklahoma State Regents Board Room on Monday, February 22, 2010. Diana also presented materials on the biotechnology program in the first "Homeschool to TCC" event at the Metro Campus, Center for Creativity (Event Hall) on February 18, 2010.

Union High School has 130 students enrolled in a new program called the Union Collegiate Academy. This program works to help the high school students identify their career interests by inviting in professors and professionals to discuss their careers. Diana Spencer visited Union on January 11, 2010 with a presentation of the most current science in biotechnology and the programs available at TCC. A highlight of the program included numerous slides of biotech students at TCC in their daily lab activities. During the second visit to Union High School on February 4, 2010, the students were introduced to the National Center for Biotechnology Information (NCBI) by investigating HIV and West Nile Virus and searching for alignments using the San

Diego Super Computer Workbench. Finally, on February 11, 2010 students traveled to the TCC labs to view the actual labs and participate in four hands on activities. A total of approximately 60 students participated in some manner in the TCC biotechnology presentations.

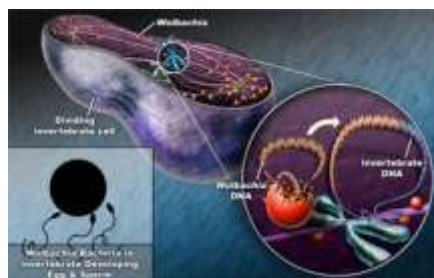


### **Translations (Community Outreach- Presentations and Workshops):**

On July 22, 2009 the Tulsa Area Bioscience Education and Research Consortium (TABERC) was created through an inaugural meeting at Oklahoma State University Center for Health Sciences. The mission of the group is to develop bioscience research in Tulsa through multidisciplinary and collaborative approaches to undergraduate and graduate education and technical training. The goal is to position Tulsa and the surrounding area to be a leader in bioscience education, training, research and innovation by utilizing assets of all area institutions of higher education. Diana Spencer is on the Executive Board of TABERC with representatives from Oklahoma University, Oklahoma State University, Rogers University, The University of Tulsa, Oral Roberts University, Tulsa Career Tech and NSU. The group meets once a month to create avenues for active research communication and implementation.

A proposed document representing a partnership with Rogers High School and the OU-Tulsa Community Engagement Center (OUCEC) has been developed through meetings with Pam Pittman of OU Schusterman, Melissa Venable, Small Learning Centers Coordinator of Rogers, Wanda Dickinson, Rogers HS and Diana Spencer, Donita Gray and Donna Kline from TCC. The partnership involves several outreach activities and can be found at the web site <http://tulsa.ou.edu/oucec/index.htm>.

Recently, undergraduate research was institutionalized at TCC. The Undergraduate Research and Scholarly Activities (URSA) Committee consists of Dr. Bryan Copedge, Dr. Connie Hebert, Dr. Diana Spencer, Dr. Patrick Idwasi, Dr. Gary Hunt, and Professor Patty Smith. This Committee has worked and will continue to work with the Council on Undergraduate Research (CUR) and the Oklahoma State Regents for Higher Education (OSRHE). They have developed a mission statement and a plan of action to develop undergraduate research at TCC. Patty Smith and Diana Spencer presented Undergraduate Research and Scholarly Activities at Tulsa Community College for the OACC Conference in Midwest City, Oklahoma on February 26, 2010. More information is available in the *Celebrate Learning!* newsletter from the TCC Office of Academic Affairs.



## **The Sequence (Our Web Site):**

<http://www.TCCBiotech.org>

The opening page of this web site allows you to click on the SEEDBED icon, the MEDBED icon, or the Biotechnology icon. The biotechnology link leads you into the TCC web site of the biotechnology curriculum. Both links are constantly updated.

For the latest news and information on TCC Biotechnology, travel to our TCC Biotechnology facebook page.

Recently a web site out of the University of Utah won an award from the American Association for the Advancement of Science. The site <http://learn.genetics.utah.edu/> teaches about stem cells, cloning, gene therapy and transgenic mice. Go to the site and see if you can build a DNA molecule or see the connection between rat pups and the epigenome.

ARTWORK COURTESY OF NSF