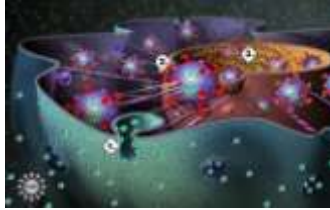




## The SDS Biotechnology PAGE

### FALL 2010

Welcome to the Fall 2010 newsletter for the Tulsa Community College Biotechnology Program and past 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 Summer and Fall Include:

- Numerous TCC Biotechnology students have been awarded scholarships and internships this spring and summer.
- SEEDBED and MEDBED faculty and staff presented four academies during the summer of 2010.
- TCC Biotechnology Students in the Molecular Biology and Techniques class will be presenting a poster in November 5, 2010 to the Oklahoma Academy of Science.
- The NSF Scholarship in Science, Technology, Engineering, and Mathematics (S-STEM) Preparing for Innovation Producing Educated STEMS Scholars (**PIPESTEMS**) grant accepted the first applications during the spring of 2010. Four of the ten recipients were biotechnology majors. Congratulations biotechie!
- This summer and fall we continued with 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. A detailed narrative is included in this newsletter.
- TCC will host Sam Rhine, genetics educator on November 22, 2010 in the Performing Arts Center for Education (PACE). Dr. Diana Spencer will be able to welcome the students and Sam Rhine with a short presentation of the biotechnology programs available at TCC.
- Work continues in the development of articulation agreements with four year academic institutions. A draft of an agreement with Northeastern State University/ BA has been produced and work is continuing for official approval.
- Diana Spencer was awarded a fellowship to the Bio-Link's Summer Fellows Forum 2010: "Connecting Bio-Link to Vision and Change." The program was held at the Clark Kerr Campus in Berkeley, California. Diana presented *Biotechnology Secondary Outreach and Recruitment: Activities and Techniques*.
- TCC and the biotechnology department and Oklahoma INBRE will host A Forensics Evening on Friday, November 19, 2010. Five guest speakers will be highlighted below.



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

Through our consortium agreement with the OU Health Sciences Center and NIH, five TCC students, two of them biotechnology students, were awarded the IDeA Network of Biomedical Research Excellence (INBRE) summer student paid internships this summer. The students presented their work at the **July 23, 2010** Summer Undergraduate Research Programs poster presentation day at the Bird Library at OUHSC in Oklahoma City. Poster titles and host institutions included the following: student Michelle Prestwood with *Estrogen Receptor Alpha Disruption Increases E. coli Uropathogenesis via Upregulation of Tumor Necrosis Factor Receptors in the Kidney* at OSU/CHS; student Simone Franze with *Characterization of Gastrointestinal Microbiota Found in Prairie Voles* at OSU/CHS; student Duane Goins with *BX795 Inhibits Aurora B kinase in Xenopus Laevis Cells* at OMRF; student Heather Hayes with *Genomic Versus Non-Genomic Effects of Estradiol Benzoate Treatment on Water Intake by Ovariectomized Rats* at OSU/CHS; and Edwin Villert with *Evaluation of the Potential for BCL11B to Regulate in vitro Development of T Cell Precursors* with OU-Tulsa. Edwin Villert was awarded one of the two transfer scholarships awarded in the competition.

The students in the Molecular Biology and Techniques class plan to present a poster at the Oklahoma Academy of Science 2010 Annual Technical Meeting at Northeastern State University in Broken Arrow on November 5, 2010. The students have been working on genetic diversity or barcoding of Cytochrome C Oxidase Subunit I among a variety of arthropods.

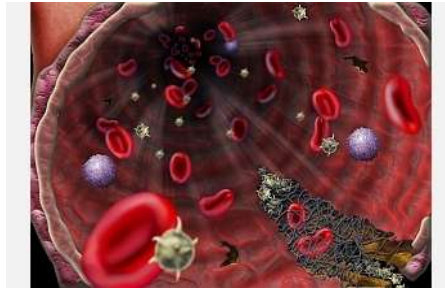
On **Friday, August 13, 2010**, PIPESTEMS scholarship recipients, mentors and the coPIs met with Patrick Idwasi at the Tulsa Community College Center for Creativity for the first orientation meeting. Approximately 40 participants were in attendance. During the welcoming continental breakfast meeting, students were given a history of the new program, participated in ice-breaker games, and learned of the activities involved in the program. Diana Spencer presented *The Joy and Responsibility of Lifelong Learning in STEM*.

TCC Biotechnology has worked with Dr. Dave Wallace at OSU/CHS to develop formalized student internships. The course number and enrollment paperwork has been approved with eight researchers from OSU/CHS signed to host our students in their labs. On Friday, August 27, 2010, approximately 15 biotechnology students met with the biotechnology faculty and Dr. Dave Wallace, OSU/CHS Director of Integrative Neuroscience. Professor Dusti Sloan presented the curriculum of the developing student internship program while Dr. Wallace shared research projects available at OSU. We plan to see the first enrollments in these courses during the Spring 2011 semester.

On October 2th, the Molecular Biology and Techniques students were able to travel to the brand new Henry Bellmon Research Center which houses the OSU Protein/DNA and Microarray Core Labs! Dr. Steve Hartson and Dr. Peter Hoyt were able to host the students with career advice and explanations of the new instruments.

Mona Easterling (AS grad Spring 2010) is continuing her studies at OSU/BA on scholarship. Kelly Wisley (Biotechnology Certificate, Spring 2010) is working in a masters program at Kansas City University in Medicine and Biosciences. Armond Swift was awarded the NSF SSTEM scholarship from OSU Stillwater, and he is doing well riding BOB the bus and carrying a full load while working within the field. Susan Limekiller (AS grad Fall 2009) has completed her employment with the SEEDBED grant and has good indications of employment in this field soon. Kelsy Thompson (AS grad Spring 2009) continues with her studies at OSU while being employed by a lab on campus.

At last count, we have four students ready to graduate with biotechnology degrees this fall, 2010.



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

**The following two paragraphs are derived from the FINAL NSF/ATE SEEDBED Report submitted in September 2010.**

We learned during the summer of 2009 that our NSF/ATE grant, Stimulating Enthusiasm, Exploration and Discovery through Biotechnology Education (SEEDBED), was granted a no-cost extension through the fall of 2010. This was great news for the Tulsa Community College Biotechnology Program as well as the area secondary teachers and students with biotechnology interests! We have experienced much success with the grant funds which is proof of our work and our passion toward creating a stellar biotechnology program and creating a pipeline of success through outreach programs. During the four years, the Tulsa Community College NSF/ATE SEEDBED program was recognized nationally with inclusion in: the April 2008 Highlights of the NSF Division of Research on Learning in Formal and Informal Settings; the FY 2008 Report of the Advisory Committee for GPRA Performance Assessment; the June 2009 Citizens' Report-- Summary of Performance and Financial Results; and we were notified by NSF of inclusion of the SEEDBED project in the new Science and Innovation Website. The dynamic new public website highlights the outcomes of NSF-funded projects across the nation and around the world. In 2010, our TCC outreach web site has had 879 visits with 3,217 visits to the site during the project; we have also documented 15,137 page views for the duration of the project. The high school teacher footlocker loan system provided 2,792 rigorous wet lab investigations in high school classrooms within the region. We documented the activity each school term: 497 labs during 2007-2008; 793 labs during 2008-2009; and 1502 labs during 2009-2010. During the four years, the TCC NSF ATE SEEDBED grant personnel have worked tirelessly to annually provide four summer biotechnology summer academies (Middle School Teacher, High School Teacher I, High School Teacher II, and High School Student), a High School Student Biotechnology Extravaganza, a foot-locker loan system to the participating regional high schools, creation of articulation agreements, and numerous other outreach activities reflected in the ancillary report, to create no fewer than 7,540 learning experiences each school calendar year.

**September 1, 2006 marked the beginning of a phenomenal development of biotechnology curriculum** for extravaganzas, outreach academies and the formal biotechnology degrees. Much progress has been made, and the progress was made possible through funds and support from the National Science Foundation and Tulsa Community College. Also responsible for the successes was the passion of many individuals to see quality biotechnology pushed to the front for rigorous, applied, and accessible education for all students in the northeastern corner of Oklahoma. This tradition will continue through multiple sustainability efforts. The biotechnology faculty will continue to provide workshops to a variety of groups including students and faculty. The NIH MEDBED project has allowed NSF SEEDBED participants to continue their growth and acquire thousands of dollars of reagents and instruments for continuous biotechnology instruction to thousands of students. Phil Lakin, the Chief Executive Officer of the Tulsa Community Foundation, the largest community foundation in the nation, visited the biotechnology labs on the afternoon of August 26, 2010 to facilitate the continuation of the growth in the biotechnology program and SEEDBED Extravaganza. The last dollars of the NSF SEEDBED grant were spent to fund a **September 24, 2010 Gap-Filling-Sustainability Workshop for SEEDBED Academy** teachers showing stellar use of the borrowed SEEDBED foot-lockers and not qualifying for the NIH MEDBED equipment due to a less than 30% minority student body. Teachers from

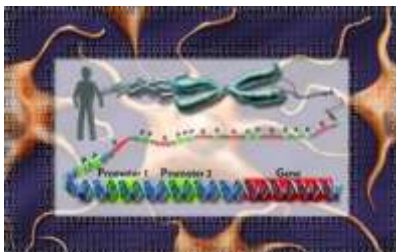
Bixby, Broken Arrow South Intermediate, Cascia Hall, Jenks, Metro Christian, Owasso, Sapulpa, and Tulsa school of Arts and Sciences attended the workshop.

During the evening of November 19, 2010, we plan to present “A Forensics Evening” with five guest speakers including: Rebecca Brown, an Innocence Project advocate; two representatives of the Oklahoma State Bureau of Investigation, Leslie Katzilierakis and Janice Joslin; and Bud and Mary Jean Busken, two parents of a murdered child with DNA evidence convicting the perpetrator. TCC will also host Sam Rhine, the genetics educator this fall. The tradition of outreach education continues. We are honored to have been a part of stimulating rigorous, science education into the northeastern corner of Oklahoma.

### **A portion of the most recent quarterly report regarding the NIH ARRA Supplemental Grant, MEDBEd follows.**

Following the January and March MEDBEd workshops for high school teachers, the MEDBEd team presented to a third cohort of teachers on June 15-17, 2010 from 9:00 a.m. until 4:00 p.m. The presentations and hands-on activity instruction included Workshop I, *Column Chromatography and Enzyme-Linked Immunoassay* and Workshop II, *Gel Electrophoresis of Precut DNA*. Eleven high school teachers attended the summer workshop. The total number of schools represented in the workshops includes 33 different schools with 39 teachers. Through a self report system, these 39 teachers work with 4,062 science students. The applications submitted for Cohort III included schools with a self-reported minority component of 30% to 65%. The summer workshops were taught by Diana Spencer, Ph.D., and she was assisted by MEDBEd Project Specialists, Donna Kline and Donita Gray. The NSF SEEDBEd Project Assistants, Susan Limekiller and Michelle DeGear, also expedited the delivery of the materials. The agenda for the workshop included more than 20 activities. This three day workshops also included a day specific for the final presentation of the NSF/ATE SEEDBEd academies. The agenda for the first two days of specifically MEDBEd activities have been previously reported. Activities in the third day included desk activities for whole genome shotgun sequencing and microarrays. The teachers were introduced to agricultural biotechnology and genetic ethical dilemma exercises on the internet. The workshop was held in the DNA Lab of the Health Sciences and Biotechnology Learning Center. Teachers also traveled to the OSU Agricultural Research Station with two investigators describing their most recent explorations. The conclusion of the workshop included a certificate and a post-survey of items learned. The announcement was shared with participants that evidence of use of the materials acquired during the first two workshops through student pre- and post-surveys from the home district would be a portion of the application for the third and fourth workshops. The first MEDBEd Workshops III and IV were presented July 19-22, 2010, and twelve teachers/schools participated.

On **June 10, 2010** during the morning and on **July 15, 2010** during the afternoon, TCC Biotechnology hosted the Tulsa Community College Northeast Area Health Education Center (NEAHEC) Careers Exploration and Math and Science in Health (MASH) Camp. The biotechnology department hosted 24 students in each program for a total of 48 students. The biotechnology presentation included four hands-on learning activities.

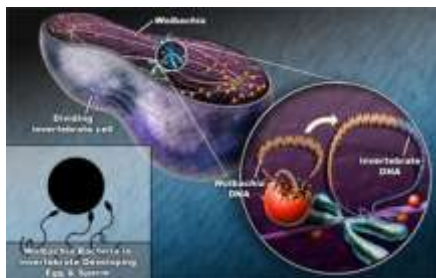


## **Translations (Community Outreach- Presentations and Workshops):**

TCC Biotechnology will be represented at the Oklahoma Science Teacher Association LEAP (Literacy, Experiments, Assessment, Professional, Collaboration) Fall Staff Development Conference. The conference is on Saturday, November 6, 2010 at Howell Hall, University of Central Oklahoma in Edmond, Oklahoma. The OSTA Fall Conference will be a time for the NIH INBRE group of educators to share. Diana Spencer will present *Protein Electrophoresis in the High School Classroom* and Donita Gray and Donna Kline will present *Biotech Labs from the Kitchen*.

The Tulsa Area Bioscience Education and Research Consortium (TABERC), created through an inaugural meeting at Oklahoma State University Center for Health Sciences continues the mission to develop bioscience research in Tulsa through multidisciplinary and collaborative approaches to undergraduate and graduate education and technical training. Dusti Sloan and Diana Spencer are 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.

Through our INBRE Oklahoma connection, TCC is developing a STEM Strategic Plan. The facilitator, Sean Griffin, is working with approximately 15 participants from the four campuses and a variety of STEM fields.



## **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.

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