

Spring 2018  
Volume 3, Issue 1



# The Investigators

Tulsa Community College  
GKFF Undergraduate Research Newsletter

## 2018 TCC NCUR Attendance Statistics:

### 28 Attendees from TCC!



◆ 13 faculty and administrators funded through TCC Foundation Grant

◆ 2 Faculty and 3 Students funded through OK INBRE Travel Grants  
(Professors Sloan and Spencer with Students Laughlin, Forrester, and Kennedy)

◆ 10 Students funded through OK INBRE Subcontract



#### INSIDE THIS ISSUE

Reflections on Memphis.....	2
Student Posters .....	4
Student Research Presentations ..	5
TCC Honors Scholars Present .....	5
Student Poster Presentations.....	6
OK INBRE SMaRT .....	7
Oklahoma Research Day .....	7
CCURI Spring 2017 Colloquium .....	7
OK INBRE Summer Undergraduate Research Program for Community College Students .....	8
Tulsa Area Bioscience Educators and Researchers Consortium Internships .....	8
Summer 2017 Application to the OK INBRE SMaRT Program .....	8
Bioinformatics Tools Investigation .....	9
Project Updates.....	10
Ongoing Projects .....	10

Organization for the travel provided by TCC and most notably—  
Melissa Thurston, Melissa Teachnor, Diana Spencer, and Cindy Shanks.



# 2018 NCUR in Edmond, OK



## Posters Presented:

- ◆ *Modulation of Nerve Growth Factor (NGF) Expression in Trinitrobenzene Sulfonic Acid (TNBS) Induced Colitis in Rat Colon*  
Christy Eslinger, Kenneth Miller, and Subhas Das
- ◆ *The Bacterial Diversity Found in the Rhizosphere Between Soil Samples Taken from Ecological Niches Using 16S rRNA Genes*  
Ashley Kennedy, Brian Forrester, and Diana Spencer
- ◆ *An Arboreal Study of Tulsa Community College's Southeast Campus*  
Connor McLellan, Macie Baldwin-Griffin, Mary Phillips, Mark Swanson, Rob Katz



- ◆ *Utilizing Cytochrome C Oxidase I (COI) for Microgenomic Identification of Osteichthyes Obtained from Rural and Urban Ponds in the Oklahoma Central Plains*  
A. Brown, A. Eberhard, C. Eslinger, M. Gates, M. Hilton, D. Johnson, A. Kennedy, A. Platt, S. Sandoval, D. Spencer
- ◆ *Food, Culture, and Society: An Interdisciplinary Investigation Including Science and Liberal Arts*  
D. Cunningham, D. Axsom, C. Fryman, J. Airhart, A. Cross, M. Easterling, D. Gray, M. Phillips, C. Thompson, D. Spencer
- ◆ *Human Development on Wildlife Diversity in Urban Wooded Ecosystem*  
Chirstie Nesbit and Brian Cosby
- ◆ *Intensity Matters: Perineuronal Nets Remodeling in Naloxone-precipitated Morphine Withdrawal on Female Adolescent Rats*  
Ashley Zongker, R. Gaglia, P. Gonzales, R. Velasquez, D. Vazquez-Sanroman
- ◆ *Viability Assay & Potential Effects of E-Juice on CHO-K1 Cells*  
A. Brown, K. Casey, A. Eberhard, C. Eslinger, S. Grace, A. Hughes, D. Johnson, A. Kennedy, S. Laughlin, C. Longden, K. Smith, D. Sloan





## Oklahoma Research Day 2018

Oklahoma Research Day 2018 was hosted by Northwestern Oklahoma State University at Enid's Central National Bank Center on March 9, 2018. Diana Spencer was able to attend the Council on Research for Regional Universities Meeting and students and faculty from TCC were able to present their posters at one of two sessions in the Event Center. Students included Rosa Zavaleta, Lilly Hughes, Ashley Brown, Melissa Gates, Christy Eslinger, Ashley Kennedy, Alissa Eberhard and Steven Grace. Professors attending included Jerilyn Schultz, Diana Spencer, and Mark Swanson.

## REACH Workshops



Janice Airhart, OK INBRE Outreach Representative and Diana Spencer hosted two Research Externship Applications Workshops (REACH). One was held on Wednesday, January 24, 2018 in room 8244 of the SE Campus, and another was held in room 626 on the Metro Campus on Thursday, February 1, 2018. The workshops were held early so that deadlines could be met for summer internships, and approximately 18 students participated.



## The Village of the Annual Biotechnology Extravaganza at Tulsa Community College

On Friday, February 23, 2018, seven high school buses dropped off approximately 90 students in front of the TCC Performing Arts Center for Education (PACE) on the Southeast Campus of TCC. Students traveled to the PACE from small rural schools and large urban school settings. Represented schools included Union, Sapulpa, Oologah, Kellyville, Broken Arrow, and Drumright. Inside the building, the students turned in Talent Release Forms and filled a questionnaire regarding their knowledge of biotechnology. They filed into the cushy chairs of the PACE and learned about the wonder and necessity of updated science to solve current problems of feeding, fueling, healing, and cleaning the world through the newest technologies. They learned that during the ten year “reunion” of TCC biotechnology graduates, data was compiled on the graduates. They learned that as of 2016, data show that 43% of our biotechnology graduates were successfully pursuing graduate degrees, and that 92% have either completed bachelor’s degrees or worked in the field. Speakers included Provost Dr. John Gibson, GKFF Endowed Chair of Research Diana Spencer, and Dr. Jim DeKloe, Director and Founder of the Industrial Biotechnology program at Solano College in the North San Francisco Bay area. Jim inspired students with two engaging talks: *The Biotech Century: How Biology Will Change Our Lives in the 21st Century* and *Life and Death Biotechnology*. Both talks were fantastic and students were mesmerized by the personal story shared by Dr. DeKloe. The story can be found at Dr. Sandy Porter’s blog at <https://digitalworldbiology.com/archive/its-all-about-aunt-millie>

After the program in the PACE, half of the students were guided by TCC Biotechnology student volunteers to a variety of “hands-on” research introductory lab stations. The TCC students shared their instructions and training with the high school students. They extracted DNA, used a biotech enzyme to make cheese from milk, loaded agarose gels, analyzed polyacrylamide gels and analyzed mutation types and gel electrophoresis. Some of the “magic” of the extravaganza is evident as the TCC students—“the trained”—become the trainers in the basic tools of research. In another room, the other students were provided with lunch and information about TCC enrollment and TCC Biotechnology programs.



## The Village of the Annual Biotechnology Extravaganza at Tulsa Community College Cont.

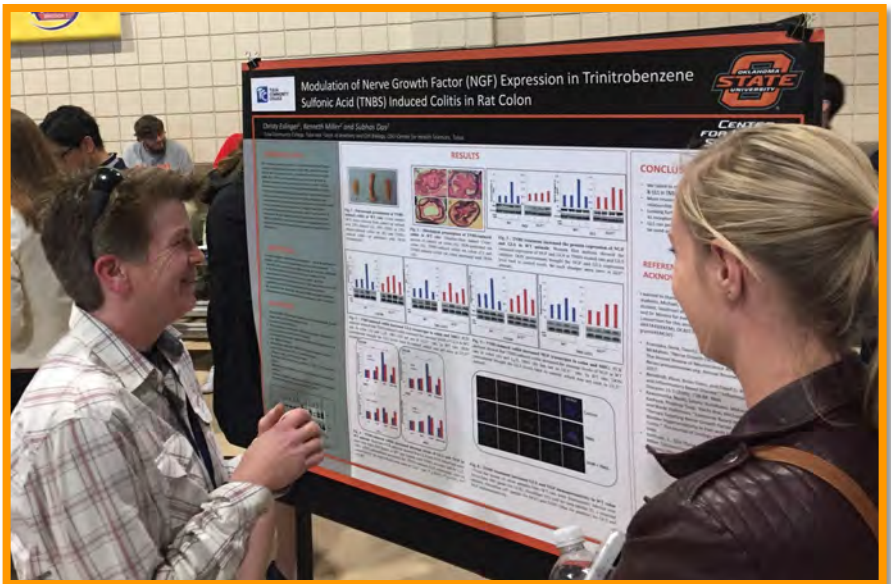
The extravaganza offering began with an NSF/ATE grant called Stimulating Enthusiasm, Exploration, and Discovery through Biotechnology Education (SEEDBED) in 2007 and progressed through a series of funding cycles and entities through the years. Oklahoma INBRE has funded the program during the last nine years. The programs have seen three provosts making welcomes, and probably 240 TCC biotechnology students directing close to 1200 students through the labs. Every year, a minimum of six faculty members devoted their Friday to the success of the program while being available in all of the lab rooms to ensure that all lab manipulations were completed successfully. Secondary faculty succeeded in getting students chosen, completing talent and travel forms, arranging transportation, and ensuring that the substitute teacher at the “sending” school had good substitute lessons.

Each of the twelve years, it seems that the production required a million moving pieces, but somehow it came together through the workings of stellar staff, students, and faculty. We have had to maintain great flexibility, especially during the actual week. We have had sending schools cancel, faculty leaders cancel, and speakers cancel. While frustrating, the cancellations most often involved family emergencies, and we were able to quickly remedy the empty spots because the volunteers involved were remarkable. During the day, the PACE professionals always made the speakers comfortable, and they were prepared for any type of speaker. I especially remember special care for a nursing mom professional-speaker needing a lactation room. Often the specialists of IT were required to assist the variety of lap tops that we used in the programs. We have hosted scientists strategically involved in the Human Genome Project, alumni of our biotechnology program working on a variety of graduate-level research projects, leaders at the Oklahoma State Bureau of Investigation, the director of a graduate forensic science program, and the exonerated man through the Innocence Project who was depicted in the nonfiction book [The Innocent Man: Murder and Injustice in a Small Town](#). It has been an incredible ride of professionals and students working as a team to describe the capabilities of a science that will propel us to feeding, fueling, cleaning, and healing the world.

## 2018 TCC Stayonference: Forward Thinking



On March 2, 2018, TCC Faculty Association, Engaged Learning Division, and Oklahoma INBRE provided ***Stayonference: Forward Thinking***. The top-notch professional development included several research offerings. The keynote address ***Active-Learning in the Classroom: Strategies, Obstacles, and Impacts*** was delivered by Dr. Jim Hewlett, the National Science Foundation Community College Undergraduate Research Initiative Principal Investigator, also delivered a talk for a break-out session: **Research as Pedagogy Driving Cultural Shifts**. In this talk, Dr. Hewlett described that as a pedagogical approach, undergraduate research can be considered a disruptive innovation for community colleges. We explored how the culture of a public 2-year institution contains barriers to innovation and how change agents can be drivers of cultural shifts that remove those critical barriers. A second break-out session **Research at Tulsa Community College: Interdisciplinary Investigations and Tool Development** was presented by Diana Spencer, Janice Airhart, Mona Easterling, Anne Cross, Christine Thompson, Mary Phillips. Undergraduate research positively impacts a diverse student body with early and active involvement in foundational tools. Also course-based investigations were shared. Opportunities that are available to TCC student and faculty members, interdisciplinary research investigations as well as research tool development were given. Finally **Undergraduate Research: Building Success Through Collaborations** was presented by Diana Spencer and Jim Hewlett. Partner institutions in the Community College Undergraduate Research Initiative (CCURI) and TCC faculty have used varied collaborations to overcome barriers to develop course undergraduate research experiences. Examples of how collaborations have enhanced instructor scholarship and student instruction were shared with the result of in-depth investigations, rich discussions, and an energized learning community. All attendees were grateful for the work of the organizers to provide the professional development without the complications of travel!



## Christy Eslinger represents TCC

Christy Eslinger represented Tulsa Community College at the 2018 Research Day at the Capitol. The event was established over 20 years ago to showcase the outstanding undergraduate research being conducted in Oklahoma in the areas of STEM. Christy completed an OK INBRE research investigation during the summer of 2017 with Dr. Das at OSU/CHS, and she competed at TCC for the position to share her research. Christy shared at the prestigious event which is sponsored by the Oklahoma State Regents for Higher Education, Oklahoma Established Program to Stimulate Competitive Research (OK EPSCoR), and the National Science Foundation. Christy shared her research on Monday, March 26 to the judges and then shared with the Legislators and public on March 27, 2018. Christy made TCC proud!

## OK-INBRE SMaRT Program



The IDeA Network of Biomedical Research Excellence (OK-INBRE) supports the Summer Mentoring and Research Training Program (SMaRT). This summer of 2018, two students from TCC will be researching in area labs. Dr. Das Bradoo (NSU/BA) selected TCC student Chalisa Longden to work in her lab regarding cancer research. Drs. Diana Spencer and Bryan Coppedge selected TCC student Lydia Ostmo to work in their labs regarding a native insect's microbiome. The summer of 2018 will be exciting for the faculty and students with many discoveries!



## Two Representative 2018 NCUR Reflections



**Please enjoy the two NCUR reflections by a faculty member and a student. All of the reflections from the travelers are also available on the Engaged Learning Website.**

Participating in NCUR this year, my reflections fall along 3 notions:

1. I enjoy watching our students (TCC) experience and respond to this conference on several levels. This is a large conference with hundreds of student presenters. When our students realize they are one of hundreds, once they get past the initial panic and complete their presentation, I see an enormous pride wash over them. Their confidence builds, they take the opportunity to learn from their fellow students, and many of them suddenly begin to see themselves as part of a larger research community that they can carry forward into their futures. This experience also allows them to come in contact with a large diverse group from different parts of the country and world. I tend to hope their growth in diversity appreciation grows an inch or two.

2. I always learn from the Student Presenters, whether through their verbal or poster presentations. I heard one presentation on American Mormonism. This is a topic we don't see often in this part of our world. One young man presented a poster presentation on classical sociological perspectives and new ways to study, apply, and teach them in today's postmodern world. Quite advanced abstract thinking for an undergraduate student. I will be contacting him to discuss his research further.

3. My lesson after attending this conference which keeps getting reinforced, is that if I take the time and effort to work with undergraduate students on research knowledge and skills, they will gain valuable experiences in academia, social networking, and how their research might contribute to their communities and/or own self-worth.

Thanks to the folks at Engaged Learning and to Diana Spencer for making this opportunity available!

***Gay Phillips***  
*Professor of Sociology*



## Two Representative 2018 NCUR Reflections cont.

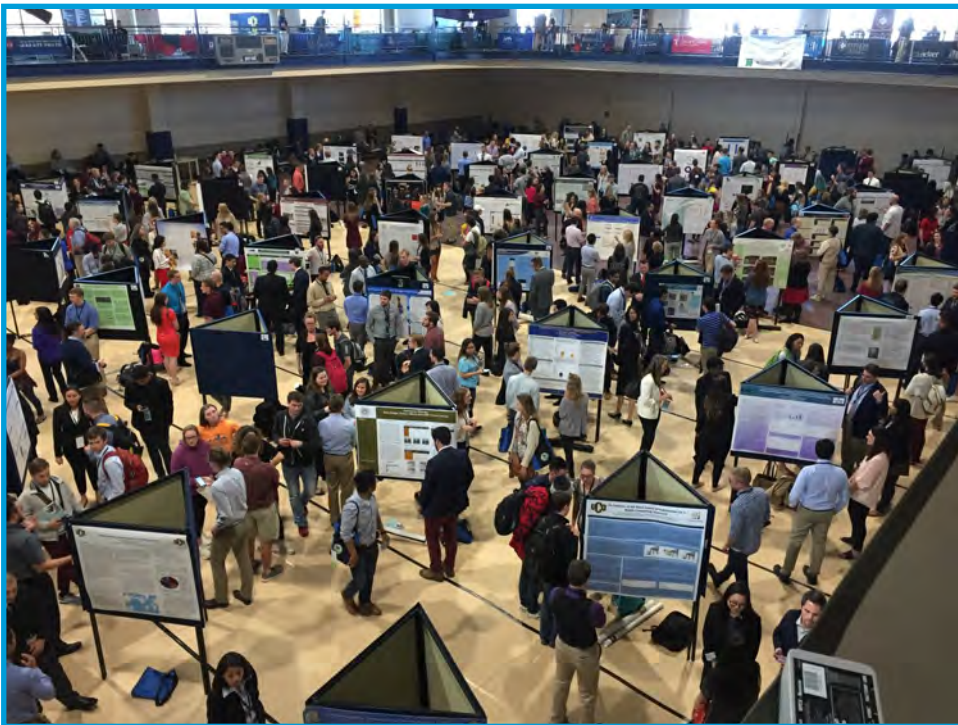
Having never been to a conference like his before, I really didn't know what to expect. I only signed up at first to get a better graduate school application, and truthfully, I thought I wouldn't enjoy the trip at all. I had pictured dark auditoriums in which one person at a time was presenting a poster for about an hour or so, with maybe a crying baby here and there, but otherwise silent and boring. What I was presented with was unbelievably better. The science fair-esque environment for the poster presentations gave me the opportunity to really dig in and learn about subjects that I thought were interesting (one example being a presentation on using micro-RNA, which I had never even heard of, to, in short, prevent lung, cervical, and breast cancer), and here and there stopping to broaden my horizons on something I normally would never have studied (if you need to know how to tell if your 16th century porcelain plate is authentically Oriental or if it's a Dutch knockoff from the same era, I'm officially your guy). In addition, the grad school booths on the second floor presented me with an amazing opportunity to talk to recruiters from every corner of the state in the period of one hour, rather than e-mailing the school individually and waiting to hear back. Some of the schools I had never even thought to consider, such as two of my (now) top choices, Alabama University and West Florida University. The freedom to roam on my own and visit whatever I was interested in was nice as well. It allowed me to go a couple to oral seminars, have some deep discussions with other students that were interested in the same subject matter, and make new friends. I also feel like this was a great opportunity to network. I just realized about a year ago how important networking is, and I'm realizing that more and more as time goes by. I got to truly know many great people while I was there, and these connections may prove to be invaluable in the future. When it got time for me to actually present, it was nerve-wracking, but I got through it, while hearing ideas from other students on how to possibly improve the current research or ideas of how to further research on the next project. Yet another great moment, and admittedly a surprising one was listening to Kareem Abdul-Jabbar give his speech. I was slightly wary of going and almost did something else, but I'm glad I didn't! I expected the whole thing to be about sports, and while some of it was,

## Two Representative 2018 NCUR Reflections cont.



most of it was about how to help others learn, black lives matter, professional athletes and their place in political activism, religion, and finding yourself. It was very eye opening in many ways. So, out of all of this, if I had to choose a favorite take-away from the whole trip... it would have to be the confidence in myself that I now have. My end game is to become a college professor and to do that I plan on getting my PhD. It's an incredibly daunting task, and if you had asked me in high school if I thought I had the ability to get a PhD I probably would have laughed at you. I would have told you that I never would be able to get into graduate school, let alone pass it. While I have other things factoring into my new found confidence (support systems, better grades than high school), this conference really pushed it over the edge. There is no longer a doubt in my mind that I can do this, that it will be enjoyable and rewarding, and that I have the ability to use my research to help others, which is arguably the very meaning of life.

***Dillon Cunningham***  
*Student Presenter*



## Project Updates



- ◆ Edgar Scott and Lydgia Jackson from OU/HSC and OK INBRE Bioinformatics CORE worked with Diana Spencer to provide bioinformatics training for a number of students during the spring semester of 2018. Six faculty in nine sections collected pre- and post-survey data on more than one hundred student participants. Results indicate that the two-hour investigation is beneficial for the students' understanding of these cutting-edge skills!
- ◆ The SEARCHH & ASPIRE and Research and Scholarly Activities group met three times during the semester with the final meeting at the NCUR convention. Minutes of the meetings are available on the Engaged Learning Website.
- ◆ **Congratulations to TCC students selected for research internships during the summer of 2018!**
  - ◆ TABERC Scholars include: Haleigh Gaines will be working in the lab of Dr. Gerwald Koehler at OSU/CHS; Hassan Khan will be working in the lab of Dr. Randall Davis at OSU/CHS; and Cari Fryman will be working in the lab of Dr. Joel Gaikwad at ORU. OK INBRE Scholars include: Asaad Chaudhry, Christy Eslinger, and Shelbie Raney. Congratulations students!

For more information, please contact:

**Dr. Diana Spencer**

GKFF Endowed Chair of Research  
Phone: 918-595-8605  
Email: [diana.spencer@tulsacc.edu](mailto:diana.spencer@tulsacc.edu)

Or

**Engaged Learning Division**

Tulsa Community College  
West Campus, L-244  
7505 W. 41st St. South  
Tulsa, OK 74107  
Phone: 918-595-8045  
E-mail: [engagedlearning@tulsacc.edu](mailto:engagedlearning@tulsacc.edu)  
Web: [www.tulsacc.edu/engagedlearning](http://www.tulsacc.edu/engagedlearning)

