



ENGAGED
LEARNING

THE INVESTIGATORS
NEWSLETTER
Volume 4



OK INBRE SMART PROGRAM

TCC student Lydia Ostmo was able to participate in the OK INBRE Summer Mentoring and Research Training (SMaRT) program while researching in the TCC laboratories...

[FINISH READING ON PG 4](#)

TCC STUDENT SUMMER 2018 RESEARCH

We have reports of thirteen TCC students who were able to complete research investigations during the summer of 2018...

[FINISH READING ON PG 2](#)



APPLIED BIOSCIENCE RESEARCH COURSE AT TCC

Students enrolled in the Applied Bioscience Research Course met with Dr. Connie Murray on the TCC campus to collect flower specimens...

[FINISH READING ON PG 5](#)



CCURI FALL 2018 COLLOQUIUM

During the Community College Undergraduate Research Initiative Fall 2018 Colloquium at Glendale Community College outside of Phoenix, Arizona on November 28 to December 1, 2018,

[FINISH READING ON PG 8](#)





TCC

student summer research

We have reports of thirteen TCC students who were able to complete research investigations during the summer of 2018. These students were involved in the TCC Biotechnology Applied Bioscience Research Course, or were awarded research funding through the Tulsa Area Bioscience Education and Researchers Consortium (TABERC), the Oklahoma IDeA Network of Biomedical Research Excellence (OK INBRE) or the Summer Mentoring and Research Training Program (SMaRT).

OK-INBRE is a grant awarded by the National Institutes of Health Institutional Development Award (IDeA) Program to the University of Oklahoma Health Sciences Center with Diana Spencer serving as the Community College Lead. TABERC scholars presented at the 2nd Joint Meeting of the Oklahoma Society of Physiologists (OSP), the Tulsa Chapter of the Society for Neuroscience (T-SfN), and the Tulsa Area Bioscience Education and Research Consortium (TABERC) on July 23rd, 2018 at the A.R. & MaryLouise Tandy Building at OSU/CHS. On July 13, 2018, students from the OK INBRE Summer Research Internship Program presented their work at the Bird Library Auditorium at OU HSC in Oklahoma City.





SUMMER Research Posters

2018 Summer Research Posters

with TCC Students Highlighted

OK INBRE Programs

ARIPIRAZOLE DOSE RESPONSE ON IL-1B-INDUCED CHEMOKINE EXPRESSION IN HUMAN MICROGLIAL CELLS.

Presented by [Asaad Chaudhry](#), Daniel Buck, and Dr. Randall Davis.

Department of Pharmacology and Physiology, Oklahoma State University - Center for Health Sciences, Tulsa, OK.

UNCOVERING A CANCER DEFENSE MECHANISM BY INVESTIGATING MCM10:MRC1 INTERACTION.

Presented by Batuel Okda, [Chalisa Longden](#), Bryan Wright, Cody Hillman, and Sapna Das Bradoo.

Department of Natural Sciences, Gregg Wadley College of Science and Health Professions, Northeastern State University, Broken Arrow, OK.

ISOLATION AND CHARACTERIZATION OF ACTERIOPHAGES FOR PHAGE THERAPY

Presented by [Shelbie Raney](#), Senait Asefa, William Meek, and Gerwald Koehler.

Department of Biochemistry & Microbiology, OSU Center for Health Sciences, Tulsa, OK and Department of Anatomy & Cell Biology, OSU Center for Health Sciences, Tulsa, OK

GLOBAL DEMETHYLATION ATTENUATES GLUTAMINASE AND NERVE GROWTH FACTOR IN TNBS-INDUCED COLITIS

Presented by [Christy Eslinger](#) with Mentor Dr. Subhas Das

Oklahoma State University Center for Health Sciences

TABERC Programs

FLUORESCENT PROTEIN LABELING AND GENE EXPRESSION ANALYSIS IN LACTOBACILLUS STRAINS.

Presented by [Haleigh Gaines](#), Senait Assefa, and Gerwald Köhler.
Oklahoma State University-Center for Health Sciences.

KETAMINE EFFECTS ON IL-1 INDUCED CHEMOKINE EXPRESSION IN HUMAN MICROGLIAL CELLS.

Presented by [Hassan Khan](#), Daniel Buck, and Randall Davis.
Oklahoma State University-Center for Health Sciences.

THE EFFECT OF THERACURMIN ON STAPHYLOCOCCUS AUREUS.

Presented by [Cari Fryman](#) with Mentor Joel Gaikwad.
Oral Roberts University.

OK INBRE SMaRT Program

Also during the summer of 2018, TCC student [Lydia Ostmo](#) was able to participate in the OK INBRE Summer Mentoring and Research Training (SMaRT) program while researching in the TCC laboratories. Diana Spencer and Bryan Coppedge worked on a SMaRT application together to secure funds for Lydia's research. Lydia also had to present her transcript before the application was funded. Diana said, "It was a great collaborative project. Bryan brought the idea and an entomologist's expertise, while I was able to work with Lydia on the tissue and apply molecular techniques." The project began with insect larvae collection in a Cross Timbers environment and concluded with a diversity index analysis of next generation sequencing data from native and invasive species. Lydia also completed eight hours of Responsible Conduct of Research Training. The project poster titled **MICROBIOMES OF NATIVE AND INVASIVE BEETLES, COMPARING O. CINGULATA AND A. GLABRIPENNIS** was presented at the July 23, 2018 meeting.



Applied Bioscience Research Course at TCC

Students enrolled in the Applied Bioscience Research Course met with Dr. Connie Murray on the TCC campus to collect flower specimens. While the collection had to be quick due to a huge rain storm, the summer research was successful! Dr. Murray helped to identify the flowers and the students worked through the summer to see if they could match those identifications with bioinformatics tools of the sequencing data of the isolated and amplified DNA. The poster, **ISOLATING, CLONING, AND ANALYZING A GAPC GENE FROM PLANTS IN THE CENTRAL PLAINS** was completed by students A. Benton A., K. Gabriel K., I. Hadley I., T. Nguyen T., and M. Waska M while working with teacher, Diana Spencer. The students presented at the July 23, 2018 meeting.



The Creating Collaborative Connections in & through Undergraduate Research:

The Council on Undergraduate Research Biennial Conference was held at the Hyatt Regency Crystal City in Arlington, Virginia on July 1-3, 2018. On Sunday, in the Lincoln Room, Diana Spencer served on a panel in the Innovation and Collaboration in Undergraduate Research thread with the title of *Successful Undergraduate Research Connections between Two-Year and Four-Year Colleges and Universities*. The group discussed opportunities and pathways that allow student researchers to transition seamlessly from two-year to four-year institutions. The goal of the session was to share best practices, as well as the benefits and challenges, of connecting two-year and four-year undergraduate research experiences for students and related professional development for faculty. Fellow presenters were from Moraine Park Technical College, the University of Dayton, the University of Wisconsin in Whitewater, and California Polytechnic State University in San Luis. One of the participants in the audience was Amy Dronberger, Ph.D., the Manager of Research Operations at OSU. The visit in DC led to some fruitful collaborative discussions with Dr. Dronberger in Tulsa.

Engaged Learning Seminar Series

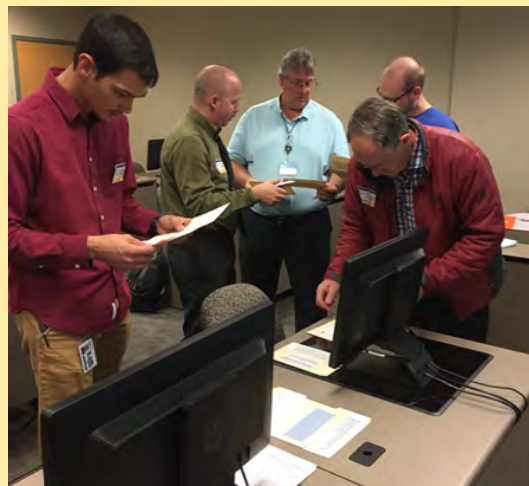
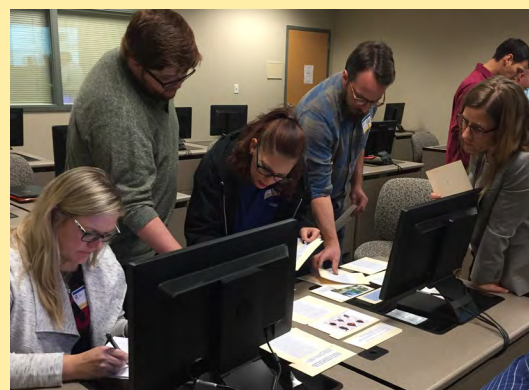
On Friday, October 12, 2018, the October Engaged Learning Seminar Series Theme: The Scholarship of Teaching and Learning included a track of Developing the High-Impact Practice of Undergraduate Research in Your Classroom. The track included three discussions:

- Introduction to TCC Research: Tools of Undergraduate Research – What? Why?
- Nuts and Bolts of Embedded Research Projects and Posters Within a Semester
- Interdisciplinary Development & Collaborations

The discussions were led by Diana Spencer. Also students and faculty presented on panels. Faculty member presenters included: Mark Swanson, Mary Phillips, Janice Airhart, and Dusti Sloan. Student presenters included: alumni Christy Eslinger and Lisa Longden. Beyond the presenters, five TCC faculty members and eleven faculty members from Amarillo, Texas attended the sessions. Funding and organization was provided by TCC Engaged Learning and the Community College Undergraduate Research Initiative.



EL
SEMINAR
SERIES



Dr. Diana Spencer represents TCC

Diana Spencer represented TCC in two summer research venues. The 7th Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE) was held June 24-26 at the Wardman Park Marriott in Washington, D.C. The agenda included plenary presentations, keynote presentations, poster presentations, discussion forums and workshops. The meeting provided ample opportunity for learning and collaboration. Several casual meetings of the OK INBRE community college representatives took place. CUR also held the Annual Business Meeting in which the Executive Board and General Council work to shape the future of CUR and undergraduate research. This meeting was June 28-30 in Arlington, VA at the Hyatt Regency Crystal City. Diana specifically serves as a Biology Councilor, works on the Biology Newsletter for the organization, and works to stimulate diversity awareness within the group.

Honors Research Retreat

On Friday, October 26, 2018, the Honors Research Retreat that is sponsored by the Honors Program presented a one-day workshop focused on formulating research questions, research opportunities, and memory research. The activities were presented in the TCC Center4Creativity in Tulsa, Oklahoma. Diana moderated a student panel of alumni in the sciences and humanities and presented research opportunities at TCC. Lydia Ostmo was selected as the TCC representative for the Oklahoma EPSCoR Research Day at the Capitol. Please see the Honors Newsletter and Website for a complete program.





Community College Undergraduate Research Initiative Fall 2018 Colloquium

During the **Community College Undergraduate Research Initiative** Fall 2018 Colloquium at Glendale Community College outside of Phoenix, Arizona on November 28 to December 1, 2018, Drs. Dusti Sloan and Diana Spencer accompanied students Carlos Cuza and Jessica Vallejo with research posters to present. As a co-PI on the NSF CCURI grant, Diana Spencer was able to present with Dr. Virginia Balke to more than 70 students. The talk ***Taking the Next Step: Skills, Tips, and Tricks to Internships, Transfer and Beyond*** was given to the students participating in the conference. Among other topics, the power of networking was presented.

Carlos and Jessica represented two embedded research projects from the Cell Culture course and the Molecular Biology and Techniques course. The posters presented were **VIABILITY ASSAY & POTENTIAL EFFECTS OF E-JUICE ON RAT LUNG CELLS** by A. Asfaha, A. Benton, TJ Brawdy, C. Cuza, M. Elturki, K. Falkensten, C. Fryman, G. Harper, A. Maher, K. Marquette, N. Morgan, T. Nguyen, K. Quang, J. Vallejo, with mentor D. Sloan and **OPTIMIZATION OF THE DNA BARCODING PROTOCOL AND THE EVOLUTIONARY HISTORY OF BOTANIC GARDEN PLANTS** by C. Cuza, S. Grace, C. Longden, E. Morgan, J. Vallejo with mentor D. Spencer. Jessica Vallejo and Carlos Cuza were able to accept the Honorable Mention Abstract Award representing their classmates on the cell culture poster. The colloquium included more than 70 posters from across the nation.

TCC Foundation Encourages Research!



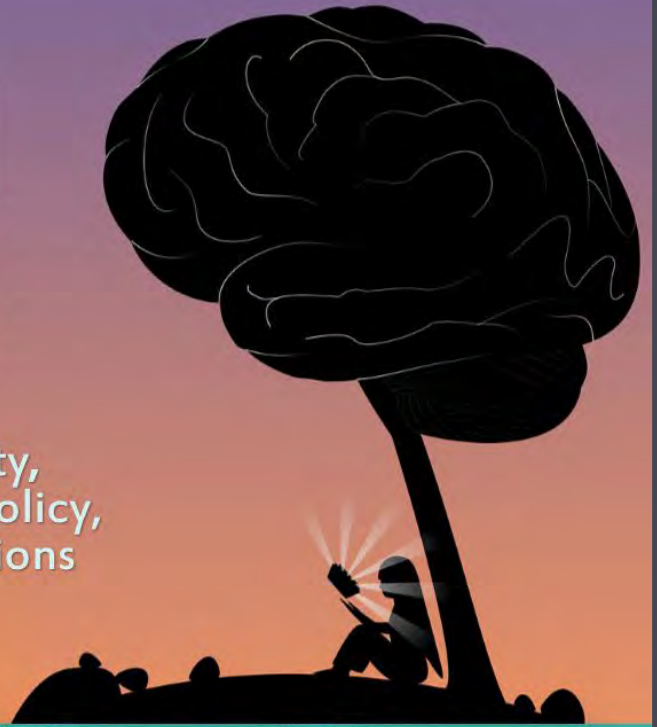
We are grateful for the TCC Foundation. The foundation is going to fund projects specifically designed for growth in research! The Foundation agreed to fund two students from TCC who are selected for the TABERC internships. The funds offset costs of the internships and provide a path for students to research in established regional labs with financial compensation for approximately 20 hours each week of the summer. Also, Dr. Dusti Sloan received foundation funding for several student internships in biotechnology related areas through work with faculty researchers at OSU/CHS! Also the Foundation has funded travel for faculty to the 2019 National Council on Undergraduate Research (NCUR) to be held at Kennesaw State near Atlanta, Georgia next year, April 11-13, 2019. Several student/faculty teams submitted abstracts, and we will learn if they have been accepted early in the Spring 2019 Semester. We look forward to continue growth of our research community and learning through this national organization!

Oklahoma INBRE Travel Grant Applications increase by TCC Faculty!

We are ecstatic to report that five faculty applied for and were awarded OK INBRE professional development travel grants for faculty and students. Each grant totals \$2000 with a total of \$10K added to the research travel budgets for TCC faculty and students. October 19, 2018 was the deadline for an application for the travel grant. The travel grant funds science related to biomedical and human health and disease missions of the NIH and OK-INBRE. Following the shortest of coaching sessions, three faculty members made their charter application to the organization. CONGRATULATIONS to Mark Swanson, Mary Phillips, Mona Easterling, Dusti Sloan and Diana Spencer. These funds will assist the faculty/student attendance at NCUR in Georgia next April 2019.

SEArCHH & ASPIRE

Sustainability, Energy, ACcesibiLity,
Happiness, Health, And (or) Social Policy,
Interdisciplinary Research Explorations



SEArCHH & ASPIRE

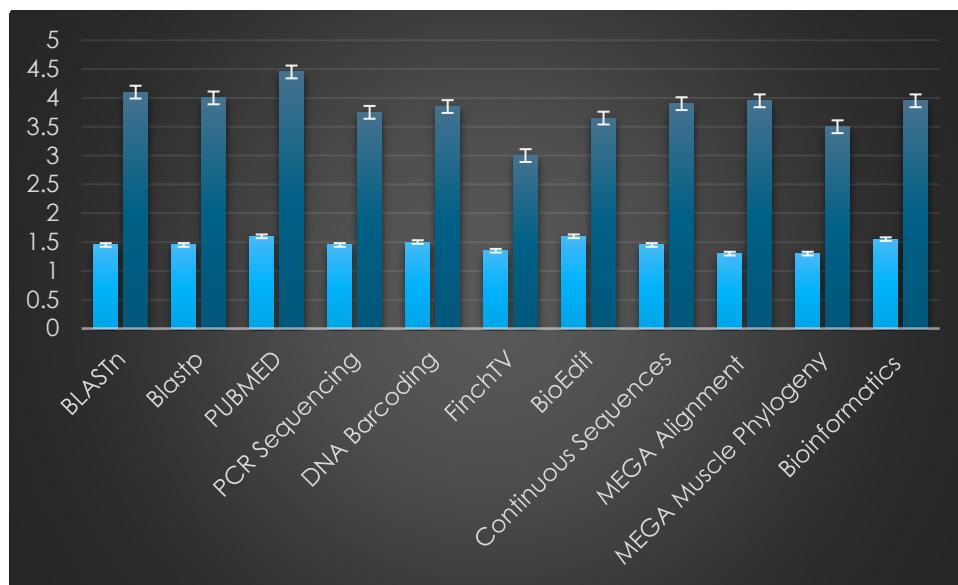
Meetings of the Sustainability, Energy, Accessibility, Happiness, Health, and Social Policy Interdisciplinary Research Explorations group (SEArCHH and ASPIRE) were held on September 7, October 5, November 2, November 16, and December 1, 2018 with time allotted in each meeting for idea sharing and studying recent published tools in undergraduate research. The meetings continued with progress and growth through the fall of 2018. Copies of minutes of the meetings can be found at the Engaged Learning Website. Much progress was made and several abstracts have been uploaded for NCUR inclusion. Some of the disciplines represented by stellar faculty attending the meetings included American Sign Language, Sociology, Occupational Therapy, Child Development, Humanities, Biology, Biotechnology, and English.

RESEARCH EXTERNSHIP APPLICATIONS WORKSHOP (REACH)

Diana Spencer and Stacia Sarwinski along with students Lydia Ostmo, Christy Eslinger, and Lisa Longden presented a workshop on externships on the Southeast Campus on October 17, 2018 and another workshop was presented on the Metro Campus on October 29, 2018. Approximately 15 participants attended the workshops. The slides used during the presentations are found on the Engaged Learning Web Site. Students from diverse disciplines attended. We thank faculty members who encouraged students to get to the workshops!

Bioinformatics Research Tools

During the week of November 5, 2018, we worked with five faculty members and ten sections of classes including Biology for Majors, Biology for Non-Majors, and Introduction to Biotechnology classes. We were able to present eleven bioinformatics concepts using freely available software to more than 112 participants. Students completed the scale of "1 Strongly Disagree/ Very Negative" to "6 Strongly Agree/ Very Positive" on eleven digital biology freeware programs/activities. The investigation uses raw data collected in the field during a faculty biology workshop. Pre- and post-surveys indicated significant growth in the concepts. We were able to present the activities within 2 hours. Dr. Lydgia Jackson from OUHSC and OK INBRE was able to present 5 of the 10 sections. A representative graph of one of the results is shown. The innovative work using 21st Century analysis tools in the first two years of post-secondary science courses is a success story! Student responses to surveys were shared with the individual teachers and a graph provided for each faculty member. One example is shown below.



Example of One Course Section of a Pre- and Post-Survey with Standard Error Bars

Science Meets Art: Life in a Drop of Pond Water and Onion Root Tip Workshop

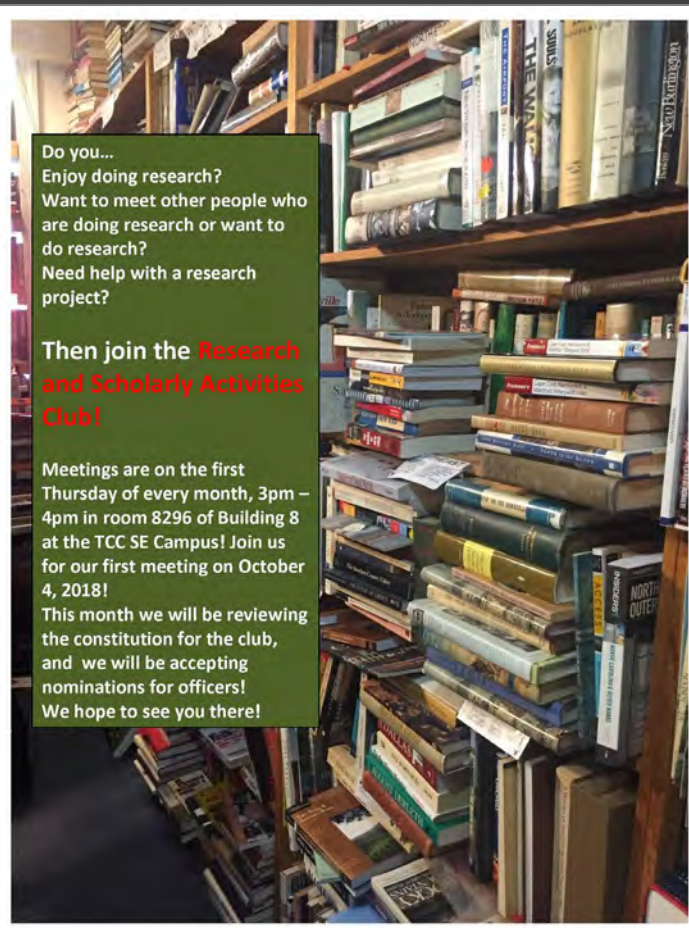
On December 14, 2018, TCC and OK INBRE presented a workshop with help from wonderful colleagues. Dr. Mark Buchheim from the University of Tulsa presented the first hour of the presentation with plankton collection and identification help. Faculty members used the ponds on the SE Campus. Mark helped to facilitate the entire workshop. Brenda Witt from Redlands Community College shared her new research on sponges in Oklahoma and mentioned the training that she received through CCURI. Diana presented onion squash mitosis slide preparation. The twelve participants received \$1200 in microscopes, and attendees included secondary faculty throughout the state and Neil Enis, Bryan Coppedge, Mona Easterling and Mark Swanson from TCC. Julie Buchheim, Stacia Sarwinski, Melissa Thurston, and Dusti Sloan worked on the process and presentations and assisted before and during the entire workshop!



Pictures from Science Meets
Art: Life in a Drop of Pond Water and Onion Root Tip Workshop



New TCC Student Research and Scholarly Activities Club!



Information shared by Andrew Maher, Bela Hadley, and Alex Benton.

We finally have a club for students to meet, grow, and discuss research opportunities at Tulsa Community College! Students volunteered and met throughout the spring of 2018 to complete the application with a new constitution accompanied by a petition signed by faculty and students. The petition was approved in May of 2018 at the Student Government Association meeting. We have elected officers with Andrew Maher as president, Patricia Williams as vice-president, Alex Benton as treasurer, and Bela Hadley as secretary. Cassandra Ortiz was selected to serve as the SGA representative. With the Southeast Campus serving as the primary campus for the club, Gay Phillips, Rob Katz, and Diana Spencer serve as sponsors. Student Life has assisted us greatly. Having just gotten our new constitution approved during this semester, we have had three meetings and a successful star-gazing event and service drive. Food was collected for the TCC Food Pantry and a blanket was delivered to Oklahomans for Equality. Our club hosted a small star party at the Mounds Observatory and met with Tulsa Astronomy Club members. We are kept up to date regarding the broader picture of research through our student and faculty presentations. Every meeting is a great time, and we have had four separate successful student presentations during our meetings. Please join us!

Future News: Oklahoma Research Day | NCUR

This newsletter is compiled by Diana Spencer, GKFF Endowed Chair of Research and enhanced and supported by the office of Engaged Learning. If you have information that you would like to see posted in the next newsletter, please contact Diana at Diana.Spencer@tulsacc.edu Also, please visit the following sites for more information on research at TCC.

- TCC Bioscience Web Site: www.tccbioscience.org
- Research and Scholarly Activities Committee Homepage: <http://guides.library.tulsacc.edu/researchandscholarlyactivities>



If you have questions regarding any of the activities listed, please contact Diana Spencer, George Kaiser Family Foundation Endowed Chair of Research. Diana.Spencer@tulsacc.edu 918-595-8605

GKFF 2019 SEArCHH & ASPIRE Meetings Scheduled:

Friday, January 25, 10:00 – 11:30 am, Metro Campus Room 500
Friday, February 15, 10:00 – 11:30 am, Conference Center Floor 8: Large Classroom 816
Friday, March 29, 10:00 – 11:30 am, Conference Center Floor 8: Large Classroom 816
Friday, April 11-13, NCUR Conference in Georgia: Faculty and Student Teams; Meeting Room and Time TBD
Friday, April 26, 10:00 – 11:30 am, Conference Center Floor 8: Large Classroom 816

Workshop for students: REACh: Research Externship AppliCations Workshop

SE Campus 8244 Wednesday, January 24, 2019 (2:30—3:30pm) and Metro Campus 500 on January 22, 2019 (2:30-3:30pm). Assistance will be provided on your cover letters for applications. Students bring your applications! We can help you!

Southwestern Oklahoma State University: Oklahoma Research Day

March 8th, 2019. Abstract Submission and Registration Deadline is Thursday, January 31, 2019. TCC offers **cushy bus travel** for students and faculty. Please see <http://www.oklahomaresearchday.com/>

NIH Summer Undergraduate Research Internship

Programs for Undergraduate Students in Oklahoma. Deadline is February 5, 2019. Please travel to <https://graduate.ouhsc.edu/Research/Summer-Undergraduate-Programs> and identify the best program for you.

TCC's 5th Sustainability Conference

Wednesday, February 20, 2019, TCC's Metro Campus McKeon Center for Creativity. Research faculty and students will be presenting.

NIH OK-INBRE Research Faculty/Student Travel Grant Application Deadline

Thursday, March 15, 2019; (Oklahoma Bioscience Capacity Building Emphasis) Travel to <https://okinbre.ouhsc.edu/Travel-Grant>

NIH OK-INBRE Summer Mentoring and Research Training Program (SMaRT) Application Deadline

Friday, March 29, 2019; <https://okinbre.ouhsc.edu/Undergraduate-Research/SMaRT-Program>

2019 OK EPSCoR Research Day at the Capitol: Tuesday, March 26, 2019

OK INBRE Bioinformatics

Proposed Week of April 1-5, 2019: **OK INBRE Bioinformatics** Media Specialist Workshop for Students in Biology Classes SE Campus: *Molecular Digital Analysis: From DNA Barcoding to Phylogenetic Trees*; All faculty welcome

33rd Annual National Conference on Undergraduate Research (NCUR):

Kennesaw State University--Georgia! April 11-13, 2019. Abstract notifications continue through middle of February. Online Registration opens Tuesday, January 28, 2019 with deadline for early conference registration on Tuesday, February 26, 2019. <http://www.cur.org/what/events/students/ncur/2019/>