OFFICIAL PROGRAM
OF THE
105th ANNUAL TECHNICAL MEETING

OKLAHOMA
ACADEMY OF SCIENCE
Affiliated with the
American Association for the Advancement of Science

FRIDAY
November 4, 2016
Oklahoma State University
Center for Health Sciences

OKLAHOMA ACADEMY OF SCIENCE
Established in 1909
“The purpose of the Academy shall be to stimulate scientific research; to promote fraternal relationship among those engaged in scientific work in Oklahoma; to diffuse among the citizens of the State a knowledge of the various disciplines of science; and to investigate and publicize the human, natural and educational resources of the State.”
(Article 1, Section 2 OAS Constitution)

Activities of the Academy


• Hosts the Annual Technical Meeting for the presentation of scientific papers by both professional and collegiate scientists.

• Sponsors symposia on selected topics of timely and vital interest to the State and Nation.

• Arranges spring and fall field meetings in different biogeographic regions of the State.

• Coordinates and promotes the activities of the Oklahoma Junior Academy of Science.

• Supervises the activities of the Oklahoma Collegiate Academy of Science.

• Provides research grants and scholarship awards to outstanding proposals submitted by secondary school and undergraduate college students.

• Provides scientific consultation services to governmental and private agencies throughout the State.
PROGRAM SUMMARY

Thursday, 3 November 2016
6:00 p.m. Executive Council Dinner/Meeting ......................... Room E-202
Barson Building

Friday, 4 November 2016
7:30 a.m. Registration for Technical Meeting ......................... atrium
- 1:30 p.m. east end of Founder’s Hall
8:30 a.m. Concurrent Scientific Paper Sessions
- 11:00 a.m.
Section A Biological Sciences – Botany ........................................ E-202
Section A Biological Sciences – Zoology ....................................... E-202
Section B Geology .......................................................................... D-113
Section C Physical Sciences ......................................................... D-201
Section D Social Sciences ............................................................... D-201
Section E Science Communication and Education ........................ D-110
Section F Geography ....................................................................... D-111
Section G Applied Ecology and Conservation ........................... D-112
Section H Microbiology ................................................................. D-207
Section I Engineering Sciences ..................................................... D-209
Section J Biochemistry and Biophysics ........................................ D-111
Section K Microscopy ..................................................................... E-378
Section L Mathematics, Statistics, & Computer Science ........... D-209
Section M Environmental Sciences ............................................... D-112
Section N Biomedical Sciences ....................................................... D-107

Special Tables .............................................................................. Founder’s Hall Atrium
Refreshments ............................................................................. Founder’s Hall Atrium

11:00 a.m. Section Meetings ........................................................ Presentation Rooms
- 11:30 a.m.
11:30 a.m. Academy Business Meeting ........................................... D-107
All OAS members are encouraged to attend. Visitors are welcome.

12:00 p.m. ......................................................... Academy Luncheon & Speaker
- 1:30 pm Founder’s Hall
(Admission by ticket only)

1:30 p.m. Poster Presentations ....................................................... Founder’s Hall West End
- 3:00 p.m. (Setup anytime before 1:30pm)

1:30 p.m. Concurrent Scientific Paper Sessions
- 4:00 p.m.

Luncheon Speaker

Dr. Robert W. Allen
Chair and Professor of Forensic Sciences
School of Forensic Sciences
Oklahoma State University Center for Health Sciences

“History and evolution of forensic genetics”

Dr. Robert W. Allen serves as Professor of Forensic Science and head of the School of Forensic Sciences at Oklahoma State University. He is also the Director of the Human Identity Testing laboratory at OSU-CHS.

Dr. Allen received a B.S. (Zoology) at the University of Tulsa in 1972 and a PhD (Cell Biology) from Purdue University in 1977. He then was awarded a Post-Doctoral appointment to Scripps Clinic and Research Foundation in 1981.

Dr. Allen worked with the American Red Cross Regional Blood Services in St. Louis between 1980-1992, developing the first DNA typing laboratory in Missouri in 1985. He also performed forensic DNA analysis for St. Louis County Police Department during that period.

Dr. Allen moved to Children’s Medical Center in Tulsa in 1992, where he developed first DNA typing laboratory in Oklahoma. He also performed forensic DNA work for Tulsa Police Department.

Dr. Allen joined the faculty at OSU’s Center for Health Sciences in 2001, where he continues today. His research interest focuses on the variability in human DNA and what it tells us about an individual. Current projects include: 1) degradation of mRNA in body fluid stains as an indicator of age of the stain, 2) molecular autopsy to identify genetic lesions underlying sudden unexplained death, and 3) new and improved methods to collect biological stains at a crime scene.
GENERAL INFORMATION

Name Badges: Name badges, provided upon registration, must be worn at all times by all individuals attending Academy section programs, business meetings, and luncheon. If your badge is not visible, you may be asked to leave by the persons in charge. Lost badges may be replaced at the registration desk upon verification of your registration documents. All presenters must register and wear an official name badge.

On-site Registration Fees: Member - $20.00  
Non-member - $25.00  
Student presenter - $20.00  
Student non-presenter - $10.00  
Luncheon tickets (if available) - $20.00

2016 and 2017 Dues are Payable: The OAS registration desk will accept dues payments.
Professional - $30.00  
Graduate/Undergraduate Student - $20.00  
Family - $35.00  
Life - $600.00

Guidelines for Abstract Publication: Abstracts may be published in the Proceedings of the Oklahoma Academy of Science, subject to the editorial policies as stated in the most recent issue of the POAS and the review of the Editorial Board. Specific formatting instructions for abstracts may be found at www.oklahomaacademyofscience.org. Abstract publication fee is $35. POAS editor is Dr. Mostafa S. Elshahed, mostafa@okstate.edu.

Executive Director: Inquiries concerning upcoming OAS activities and membership may be directed to Dr. David Bass, OAS Executive Director, Campus Box 90, University of Central Oklahoma, Edmond OK 73034, 405-974-5772, dbass@uco.edu.

Assistance or Information: Look for individuals with OAS badges or host ribbons. These are faculty and staff assigned to assist you.

No Smoking: Please, no smoking in any of the buildings on the campus.

Refreshments: Light refreshments during morning breaks will be in the atrium of Founder’s Hall.

SECTION BUSINESS MEETINGS

Section A: Biological Sciences (Zoo and Bot).......................11:15-11:30, E-202
Section B Geology .............................................................. 11:00-11:15, D-113
Section C Physical Sciences .............................................. 11:00-11:15, D-201
Section D Social Sciences ................................................. 11:15-11:30, D-201
Section E Science Communication and Education ............... 11:00-11:15, D-110
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Section H Microbiology ................................................... 11:15-11:30, D-207
Section I Engineering Sciences ...................................... 11:15-11:30, D-210
Section J Biochemistry and Biophysics ......................... 11:15-11:30, D-111
Section K Microscopy .................................................. TBD, E-378
Section L: Mathematics, Stats, & Comp. Science ............. 11:15-11:30, D-209
Section M Environmental Sciences .................................. 11:15-11:30, D-112
Section N Biomedical Sciences ..................................... 11:15-11:30, D-107

SPECIAL THANKS

Dr. Stephens and the Administration of OSU-CHS for supporting this meeting.
Staff Members, Bria’ Taylor and Darin Tyson, for all their help in making this meeting possible.
Dr. Earl L. Blewett, OAS Meeting Coordinator

UPCOMING MEETINGS

2017 Spring Field Meeting, March 31-April 2, Robbers Cave State Park
2017 Fall Field Meeting, tba
2017 Annual Technical Meeting, tba
**SECTION A: BIOLOGICAL SCIENCES – BOTANY**
E-202

Moderator: Chad King
University of Central Oklahoma

8:30  **A new spinypod from Northeast Texas, Matelea hirtelliflora** and a synopsis of it's relatives. Angela McDonnell. Oklahoma State University.


9:00  *Effects of fire intensity on habitat recovery in a mixed grass prairie ecosystem. Laura E. Jardine, Adam K. Ryburn, and Anthony J. Stancampiano. Oklahoma City University.


10:15 Flora of Oklahoma Annual Meeting – Adam K. Ryburn (editor)

NOTE: Held in room D-113.

Posters


**SECTION A: BIOLOGICAL SCIENCES – ZOOLOGY**
E-202

Moderator: Michael Shaughnessy
Northeastern State University


10:00 *Habitat Selection, Nest Box Usage, and Reproductive Success of Secondary Cavity Nesting Birds in a Semirural Setting. Alanah N. Hosford, Laura E. Jardine, and Anthony J. Stancampiano. Oklahoma City University.


10:45 **Comparing Predators and Predation Rates of Scissortailed Flycatchers Between Two Habitat Types. Dana R. Winters, Diane V. Roader, and Michael S. Husak. Midwestern State University.

11:00 Dominance relationships in juvenile five-lined skinks (*Plestiodon fasciatus*): does small size matter?. Mark A. Paulissen. Northeastern State University.

Posters
**Differentiating Between Partner Preferences and Lasting Pair Bonds. Amie D. Francis, Stephanie M. McGlothlin, and J. Thomas Curtis. Oklahoma State University.

SECTION B: GEOLOGY  
D-113

Section Chair: Kurtis Koll  
Comanche Nation College

11:00  Section B Business Meeting

SECTION C: PHYSICAL SCIENCES  
D-201

Moderator: Weldon Wilson  
University of Central Oklahoma

8:30  Gamma Analysis of Trinitite. K. A. Williams. East Central University.

8:45  Bohr Model of Hydrogen-Like Atom in 2D. W. J. Wilson (UCO), and Ameer Al-Temimy (Al-Nahrain Nanotechnology Research Center for Renewable Energy Al-Nahrain University, Baghdad, Iraq). University of Central Oklahoma.

9:00  *Time Resolved UV-VIS Spectroscopy for Monitoring Peroxide Vapors. Meagan E. Bobo (OC), Dr. Nicholas Materer (OSU), and Dr. Allen Apblett (OSU). Oklahoma Christian University.


9:30  Break


Posters


* Undergraduate  ** Graduate

* Undergraduate  ** Graduate
SECTION D: SOCIAL SCIENCES  
D-201

Section Chair: Alicia Limke  
University of Central Oklahoma

1:30 **WorthIt: Conflict Resolution Changes by Relationship Distance and Attachment. Tristan Bratcher and Alicia Limke. University of Central Oklahoma.


2:30 Break


3:00 *Perceptions of Multi-Level Marketing with MBA Students. Olivia Sharp and Robert Mather. University of Central Oklahoma.


Posters


* Undergraduate  ** Graduate

SECTION E: SCIENCE COMMUNICATION & EDUCATION  
D-110

Moderator: Stanley Rice  
Southeastern Oklahoma State University


10:45 An Economic Approach to Teaching Biological Sciences. Stanley A. Rice. Southeastern Oklahoma State University.

Posters

You are What You Eat: A Summer Academy for rising Eighth and Ninth Graders. Charles M. Crittell and Dan M. McInnes. East Central University.
SECTION F: GEOGRAPHY
D-111

Moderator: Brad Bays
Oklahoma State University

9:45  *Oklahoma City Planning Department Internship. Maxton Harris. University of Central Oklahoma.

10:00  *Indian Allotment Project: Establishing Chickasaw Boundaries. Derrick Jackson. East Central University.


10:45  Using Geospatial Technologies to Optimize Rural Field Data Collection for Historic Preservation Planning.. Brad A. Bays. Oklahoma State University.

Posters

*Chickasaw Land Patents in Mississippi. Colton Hall. East Central University.

SECTION G: APPLIED ECOLOGY & CONSERVATION
D-112

Section Chair: Jerry Bowen
Rogers State University


9:45  **Small mammal herbivores or soil nitrogen: What controls grasslands?. Nicole Poe and Lara Souza. University of Oklahoma.

10:00  Invasion biology: the dispersal of a non-native land snail in an urban landscape. Elizabeth A. Bergey. University of Oklahoma.

10:15  Response of public interest in the environment to the papal environmental encyclical, Laudato Si. Malcolm L. McCallum. Langston University.


10:45  *Effects of fire intensity on small mammal communities— 5 years post fire. Laura E. Jardine and Anthony J. Stancampiano. Oklahoma City University.

Posters

**SECTION H: MICROBIOLOGY**

**D-207**

**Moderator: Paul Lawson**

University of Oklahoma

8:30  **Methodological Improvements in Recovering Ancient DNA from Coprolites for Metagenomics. Richard W. Hagan. University of Oklahoma.**

8:45  **Progression of the oral microbiome from infancy to adulthood. DK Jacobson, K Sankaranarayanan PS Larson N Watanabe, T Tanihata, JK Lum, and CM Lewis. University of Oklahoma.**

9:00  **Intracellular Calcium Homeostasis Regulates Several Physiological Events in a Human Pathogen Pseudomonas aeruginosa. Sharmily S. Khanam, Manita Guragain and Marianna A. Patrauchan. Oklahoma State University.**

9:15  **A β Propeller Protein, CarP, Plays Role in Pseudomonas aeruginosa Response to Calcium. Michelle King, Mariette Barbier, and Marianna A. Patrauchan. Oklahoma State University.**

9:30  **Genomic and Physiological Characterization of Novel Bacteriophages Infecting Shiga-toxigenic Escherichia coli. Pushpinder Kaur Litt (OSU), Earl Blewett (OSU-CHS), and Divya Jaroni (OSU). Oklahoma State University.**

9:45  **Isolation and Characterization of a Mycobacteriophage from Oklahoma Soil. Christopher Patton. University of Central Oklahoma.**

10:00 **Isolation and Characterization of novel species belonging to the genus Peptoniphilus. Liz Saavedra (OU), Ed Moore (University of Gothenburg), and Paul A. Lawson (OU). University of Oklahoma.**

10:30 **Tick Borne Pathogens in Urban and Rural Parks of Edmond, Oklahoma. Mariah Small. University of Central Oklahoma.**

10:45 **Characterization of Plant Pathogenic Diaporthe Species Infecting Melons Imported From Central America. M. Broge, C. Biles, A. Howard, K. Karki, and B. Bruton. East Central University.**

11:00 **Metabolic changes of Chaetomium globosum grown on low levels of NSAID amended media. Yanet Camarena, Tyler Rowsey, Kimberly Condry, and Charlie Biles. East Central University.**

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**SECTION H: MICROBIOLOGY**

**D-207**

**Graduate**

1:30  **Generating mutations for functional studies of the putative Ca2+-binding protein CarP. Daniel McLeod, Michelle King, Sharmily Khanam, and Marianna Patrauchan. Oklahoma State University.**

1:45  **Quantitative and Qualitative Improvements in DNA Extraction Procedures Using a BronopolTM Tablet in Alpine Goat Milk. Ashley Newton. Langston University.**

2:00  **Validation of Multiplex Quantitative PCR Assay for Detection of Seven Major Escherichia coli Serogroups and Associated Virulence Genes in Goat Milk and Feces. Magnus W.T. Scott, Jr. Langston University.**

2:15  **Gene Expression in Staphylococcus aureus and Methicillin-Resistant Staphylococcus aureus Biofilms. Trevor Torgerson and Joel Gaikwad. Oral Roberts Univeristy.**

2:30  **The effect of calcium on the production of rhamnolipids in Pseudomonas aeruginosa. Mandy Truelock, Michelle King, and Marianna Patrauchan. Oklahoma State University.**

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**Posters**

**Proteomics Analysis of a Staphylococcus aureus Tea Tree Oil-Selected Small Colony Variant. Nathanial J. Torres, Khadija A. Abdulhafid and John E. Gustafson. Oklahoma State University.**


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* Undergraduate  ** Graduate
SECTION I: ENGINEERING SCIENCES
D-209
Moderator: Giang Xu
University of Central Oklahoma


2:00  **Enhancement of strain energy of poly(methyl methacrylate) using polycaprolactone nanofiber mesh. Harsha Jamadagni and Morshed Khandaker. University of Central Oklahoma.


Posters


SECTION J: BIOCHEMISTRY AND BIOPHYSICS
D-111
Moderator: Ning Wu
Southeastern Oklahoma State University

8:30  **Bioinformatical analysis of corticosterone-induced neuronal cell neurotransmitter degradation. Qi Long, Teresa Golden, and Ning Wu. Southeastern Oklahoma State University.

8:45  **Bioinformatical analysis of corticosterone-induced neuronal cell gene expression profile changes. Justin Shahan, Teresa Golden, and Ning Wu. Southeastern Oklahoma State University.

9:00  *Characterizing the Interdomain Conformations of the cpSRP43 - cpSRP54 Complex through Ensemble FRET Measurements. Ronald Bercaw, Dustin Baucom, Feng Gao, and Colin D. Heyes. Oklahoma City University.


Posters
**Unique Transposon Genome Rearrangements Identified in Elizabethkingia anophelis. Outbreak Strains in the Midwest US. Rita Flores, Nathanial Torres, Jessica Matts, John Gustafson, Patricia Canaan and Peter Hoyt. Oklahoma State University.

**Effect of Salt (NaCl) and Salt Substitutions in Dough Rheology and Breading. Zorba J. Hernández-Estrada and Patricia Rayas-Duarte. Oklahoma State University.


*Phosphorylation Effects on Cancer Protein’s DNA Binding. Carlee Luttrell, Jessica Matts, Dustin Steele, and Donald Ruhl. Oklahoma State University.
### SECTION K: MICROSCOPY

**E-378**

**Moderator:** Lisa Whitworth  
**Oklahoma State University**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30</td>
<td><strong>Microstructure and Texture Characterisation of Linear Friction Welded Titanium Alloys.</strong> Yina Guo1, Yu Lung Chiu2, Moataz M. Attallah2, Simon Bray3.</td>
<td>Materials &amp; Surface Science Institute, University of Limerick, Ireland, School of Metallurgy and Materials, University of Birmingham, Birmingham, B15 2TT, UK, Rolls-Royce plc, Derby, DE24 8BJ, UK.</td>
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<tr>
<td>9:00</td>
<td><strong>Probing the Molecular Organization of Cells and Organelles using Cryo-Electron Microscopy.</strong> Daniele Nicastro.</td>
<td>UT Southwestern Medical Center.</td>
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<td>10:00</td>
<td>Break and Voting on 2017 Ugly Bug Contest</td>
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<td>10:25</td>
<td><strong>Polyester or Epoxy: Assessing product efficacy in paleohistological methods.</strong> Christian Heck and Gwyneth Volkman.</td>
<td>Oklahoma State University Center for Health Sciences.</td>
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<td>10:45</td>
<td><strong>Survey of Polyethylene Oxide Polymer Electrolyte using Microscopic Methods, for Solid State Battery Applications.</strong> John Ostrander, Dale Teeters Ph.D.</td>
<td>University of Tulsa Dept. of Chemistry and Biochemistry.</td>
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<td>11:05</td>
<td><strong>Tissue Clearing with PACT, Fluorescent Immunohistochemistry and 3-Dimensional Reconstruction for the Spatial Evaluation of Protein Interactions.</strong> Michael B. Anderson and Kenneth E. Miller.</td>
<td>Oklahoma State University Center for Health Sciences.</td>
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<td>11:25</td>
<td><strong>Chloride and Sulfate Exchange in Short-Term, Low Temperature Brine + Jarosite Experiments.</strong> Kayla M. Miller (OU) Andrew S. Elwood Madden (OU), Charity M. Phillips-Lander (OU), Janice L. Bishop (SETI/NASA Ames), and Megan E. Elwood Madden (OU).</td>
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**Timpano Award Contest**

### SECTION L: MATHEMATICS AND COMPUTER SCIENCE

**D-209**

**Moderator:** Patrick Harrington  
**Northeastern State University**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenters</th>
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<tr>
<td>8:30</td>
<td><strong>Optimization of Quantum Cellular Automata: Reinforcement Learning.</strong> Patrick Harrington.</td>
<td>Northeastern State University.</td>
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<td>8:45</td>
<td><strong>Fast Algorithm for Determining if an Integer is a Highly Composite Number.</strong> Clay B. Carley III.</td>
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<td>9:00</td>
<td><strong>Measure Theoretic Approach to Reynolds' Averaging.</strong> Nicholas Jacob.</td>
<td>East Central University.</td>
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<td>9:15</td>
<td><strong>Alternating Advantage in Two Player Games.</strong> Andrew Wells.</td>
<td>East Central University.</td>
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<td>9:30</td>
<td><strong>Hermite Polynomials.</strong> Maranda Robin Clymer.</td>
<td>East Central University.</td>
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<td>9:45</td>
<td>Break</td>
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<td>10:00</td>
<td><strong>Identification of time dependent control parameter through finite difference method in parabolic partial differential equation.</strong> Melvin Lipka and Narayan Thapa.</td>
<td>Cameron University.</td>
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<td>10:30</td>
<td><strong>Diffie-Hellman Key Exchange Protocol.</strong> Samundra Regmi.</td>
<td>Cameron University.</td>
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<td>10:45</td>
<td><strong>Convergence of Iterative Methods Under Weak Conditions.</strong> Nirjal Shrestha and Ioannis Argyros.</td>
<td>Cameron University.</td>
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**Posters**

*Modeling Measles with Random Forcing. Amanda Kramer and Tracy McKibben. East Central University.*


*Binomial Transformations in the Complex Plane. Micah Godfrey. East Central University.*

**Undergraduate ** Graduate
SECTION M: ENVIRONMENTAL SCIENCES  
D-112  
Moderator: Charles Crittell  
East Central University  

8:30  The Apache local fauna from a Pleistocene karstic filling in southwestern Oklahoma, with the first Oklahoma fossil record of Helodermatidae. Nicholas J. Czaplewski (Oklahoma Museum of Natural History) and Kent S. Smith (OSU-CHS). University of Oklahoma.  

8:45  *Uptake of arsenic by iron hydroxy carbonate (chukanovite): Implications for groundwater treatment using granular iron reactive barriers. Morgan Mackey (ECU) and Richard T. Wilkin (EPA, Ada). East Central University.  


SECTION N: BIOMEDICAL SCIENCES  
D-107  
Moderator: Sapna Das-Bradoo  
Northeastern State University  

8:30  **Validation Of Proteomic Hits From DNMT1 Pulldown Data. Hayley Fischer. Northeastern State University.  


9:00  **Spatio-temporal variations in miRNA, mRNA and protein expression in peripheral nerve injury. Vadim Yerokhin and Kenneth Miller. Oklahoma State University Center for Health Sciences.  


9:30  Nicotine self-administration remodels perineuronal nets in ventral tegmental area and orbitofrontal cortex in adult male rats. Vazquez-Sanroman, D. and Bardo M. T. Oklahoma State University.  

9:45  *Regulation of PDGF-induced phenotypic switching in vascular smooth muscle cells. Lauren Bellcock, Elizabeth Bullen, Eric Howard, Dave Sherry, Jamie Watson, and Shannon Conley. Oklahoma Christian University.  

10:00 Break  

10:15  **Mcm10: A Target for Possible Cancer Treatment. Casey Eddington, Brandy Fultz, Dawn Bender, and Sapna Das-Bradoo. Northeastern State University Broken Arrow.  


10:45  *Clinical Implications of TRIM65 Amplification and Mutation. Landon Hester and Joe Zhao. Oklahoma Christian University.  

11:00  *CRISPR-Cas9 Mediated Gene Edit of Holocentric Binding Protein-2 in Caenorhabditis elegans. Jackson Higginbottom, Hadley LaMascus, and Landon Moore. Oklahoma Christian University.  

* Undergraduate  ** Graduate  

* Undergraduate  ** Graduate
SECTION N: BIOMEDICAL SCIENCES
(cont.)

1:30  *12-HETE Exerts Its Antithrombotic Effects Through The Prostacyclin Receptor. Zitha R. Isingizwe (OC), Benjamin E. Tourdot (Univ of Michigan), Reheman Adili (Univ of Michigan), Meral Abraham(Univ of Michigan), Theodore R. Holman(UCSC), and Michael Holins


2:30 Break


3:15  *Effects of Chronic B-FNA in the Cell Signaling Pathway of Normal Human Astrocytes. Ote Staton, Daniel Buck, Kelly McCracken and Randall Davis. Oklahoma State University Center for Health Sciences.


Posters


**Glial immunolabeling in female rats after short-term vs. long-term furosemide treatment. Sheri L Core and K. S. Curtis. Oklahoma State University Center for Health Sciences.


**Determining the Expression of Nerve Growth factor in rat Antigen Induced Arthritis model. Vikram Gujar and Kenneth E. Miller. Oklahoma State University Center for Health Sciences.


*Human TH2 Cells Experience Decreased Levels of IL-5 and IL-13 When Treated with 4µ8c Inhibitor. Matthew Carlile, Kyeorda Kemp, Cody Poe, and Sallie Ruskoski. Northeastern State University Broken Arrow.

*HTLV-1 promoter complex Tax/pCREB interaction with mediator subunit MED15 via the "KIX-like" binding domain. Joshua Hardage, Morgan Mackey, and Alisha Howard. East Central University.


* Undergraduate  ** Graduate
Posters


*Preliminary Study: Applying Osteopathic Manipulative Techniques in Reducing Soft Tissue Abuse in Vocalists. Breanna Anderson (TU), Kent Smith (OSU-CHS), Leslie Ching (OSU-CHS), and Susan Goldman-Moore (TU). Oklahoma State University Center for Health S.


OKLAHOMA ACADEMY OF SCIENCE PRESIDENTS

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Institution</th>
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<tr>
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<td>H. L. Lane</td>
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