



Comparative & Experimental Medicine

# RESEARCH — *Symposium* —

May 23 & 24, 2016



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## *Program & Schedule*

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Sponsored by the College of Veterinary Medicine, Tennessee AgResearch, the UTK Office of Research & Engagement, and the UT Center for Wildlife Health

# Welcome

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For the tenth consecutive year, the UT Institute of Agriculture is hosting a symposium for UT investigators with animal and human health interests. As the symposium has grown, it has become a calendar event for the Knoxville campuses of UT. The intercollegiate Comparative and Experimental Medicine (CEM) graduate program initiated this symposium in 2007 as an event to showcase the research of CEM student investigators. In 2008, the symposium was opened to participants throughout the Knoxville campuses, and there was a four-fold increase in presentations, with representation from 19 different UT departments and programs.

The CEM Research Symposium has gained both a reputation and recognition for providing an excellent venue for students and new investigators to gain experience showcasing their work as oral presentations. In addition, the gathering of UT investigators with related and varying interests provides opportunities for networking and collaboration that will enhance health-related research at the UT Knoxville campuses. The joint sponsorship of the symposium by the College of Veterinary Medicine, Tennessee AgResearch, the UT Knoxville Office of Research and Engagement, and the UT Center for Wildlife Health signifies both a shared recognition of the need for such a symposium and a cooperative spirit in bringing this exciting event to reality.

We are happy to welcome all participants and attendees and hope the experience will be as positive as it is promising.



Larry Arrington, Chancellor  
University of Tennessee  
Institute of Agriculture



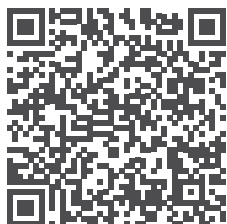
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**Abstract proceedings** are published online and are available at <https://tiny.utk.edu/CEMproc2016>.

## To view abstracts:



We wish to acknowledge the following university programs and individuals, without whom this event would not be possible:

### College of Veterinary Medicine

### Tennessee AgResearch

### UTK Office of Research & Engagement

### UT Center for Wildlife Health

Misty Bailey	Stephen Kania
Michael Cunningham	Michael McEntee
Greg Hirshoren	Kim Rutherford
	Kristen Vandergriff

We appreciate the contributions of session moderators and judges.

Thanks also to the UTCVM chapter of **Phi Zeta**, 2016 Center of Excellence/Merial Summer Student Research Program participants, and our sponsors and exhibitors.

Jimmy Cheek, *Chancellor*  
UT Knoxville

Larry Arrington, *Chancellor*  
UT Institute of Agriculture

Dixie Thompson, *Dean*  
UT Graduate School

James Thompson, *Dean*  
College of Veterinary Medicine

Taylor Eighmy, *Vice Chancellor for Research*  
UT Knoxville Office of Research and Engagement

William F. Brown, *Dean*  
Tennessee AgResearch

# Schedule at a Glance

## Monday, May 23

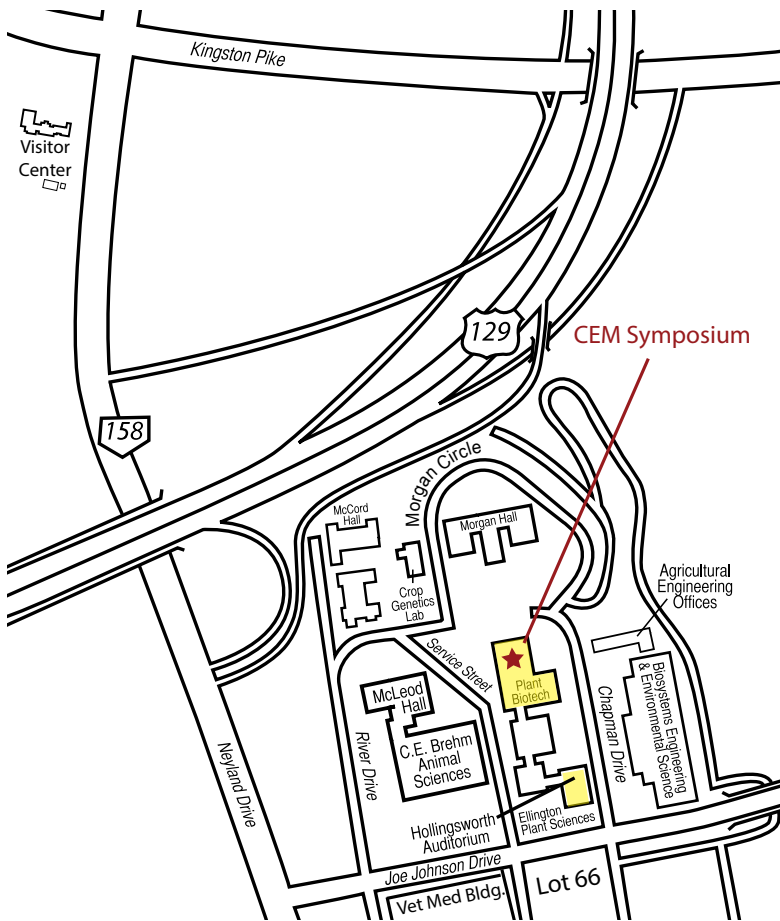
Time	Room	Event
8:30-9:00	PBB*	Morning refreshments
9:00-10:00	PBB* 156/157	<i>Keynote address:</i> <b>Susan Kutz</b> , DVM, PhD “The critical role of wildlife health for food safety and security in the Canadian Arctic”
10:30-11:45	See session matrix (p. 6)	New investigator sessions A & B
11:45-12:30	E.J. Chapman Drive	Patronize food trucks for lunch
12:30-1:30	Hollingsworth Auditorium	<i>Plenary address:</i> <b>Jonathan M. Irish</b> , PhD “Decoding tissue microenvironments using mass cytometry (CyTOF)”
2:00-3:30	See session matrix (p. 7)	New investigator sessions A & B

## Tuesday, May 24

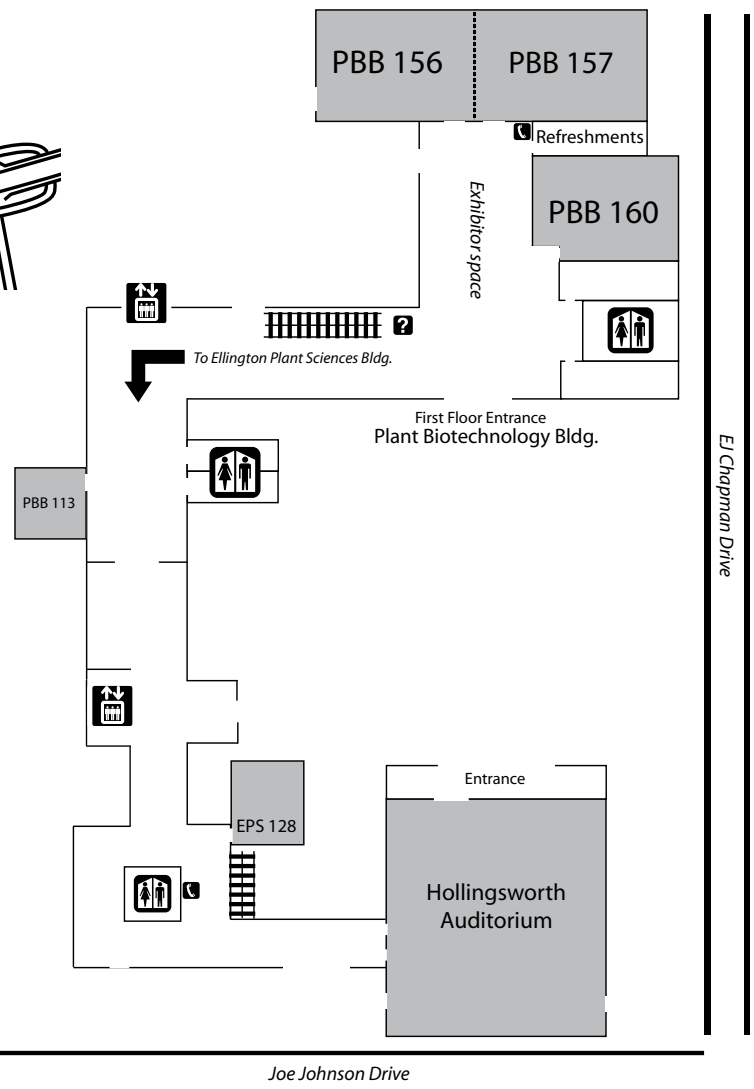
Time	Room	Event
8:30-9:00	PBB*	Morning refreshments
9:00-10:00	PBB* 156/157	<i>Invited address:</i> <b>Suzie Allard</b> , MSLS, PhD “Mentoring and your career: Symbiosis is success”
10:30-12:00	See session matrix (p. 8)	New investigator sessions C & E
12:00-1:00	E.J. Chapman Drive	Patronize food trucks for lunch
12:15-12:45	Hollingsworth Auditorium	<i>Seminar:</i> <b>Kurt Lamour</b> , PhD “Application of the MonsterPlex targeted sequencing technology and opportunities for collaborative research”
1:00-2:30	See session matrix (p. 9)	New investigator sessions D & F
5:30	Hollingsworth Auditorium	Awards Reception-heavy hors d'oeuvres

\*PBB, Plant Biotechnology Building (see map on p. 5)

# Location Information



## Plant Biotechnology Building ⇅



## University of Tennessee Institute of Agriculture Symposium Parking

A valid student, faculty, or staff parking permit is required to park in university lots. Faculty/staff with a valid hang tag may park in the UTIA Campus student lots CFN1 and C4. Faculty, staff, and students with disabilities may ride a paratransit service offered by “The T” (free for all UT faculty, staff, and students) by using the Blue Phone system and requesting the Access Service. The **Knoxville Trolley’s Vol Line** serves campus to University Commons every 10 min from 7 am–6 pm. All other bus service on campus is suspended during the symposium due to no classes being in session.

**\*Notice\*:** Lot 66 may not be used by those without permits for that specific lot (violators may be ticketed or towed). **All non-UT visitors will need a temporary parking permit.**

Full-text abstracts online at <https://tiny.utk.edu/CEMproc2016>

9:00 Keynote address: **Susan Kutz**, DVM, PhD  
 9:00 “*The critical role of wildlife health for food safety and security in the Canadian Arctic*”  
 PBB\* 156/157

### Session A–Clinical Sciences

### Session B–Infectious Diseases & Animal Science

Rm. PBB\* 160

Rm. PBB\* 156/157

10:30 1. Optimizing seeding density for MC3T3-E1 precursor osteoblast cells (**Bow**)

12. Improving surveillance and screening of La Crosse virus in eastern Tennessee (**Urquhart**)

10:45 2. Xenogeneic implantation of equine synovial fluid-derived mesenchymal stem cells promotes cartilage regeneration in a rat subchondral defect model (**Zayed**)

13. An unseen enemy: the ticks that parasitize Tennessee beef cattle (**Theuret**)

11:00 3. Cytotoxicity resulting from use of hydrogen peroxide gas for sterilization of carbon-based biomaterials (**Steiner**)

14. Exploring granuloma formation in Johne’s disease with in vitro and in silico modelling (**Rice**)

11:15 4. Comparison of methods for determining prevalence of *Macrorhabdus ornithogaster* in a flock of captive budgerigars (*Melopsittacus undulatus*) (**Sullivan**)

15. Identification of host-bacterial factors induced during experimental infection of dairy cows with *Staphylococcus aureus* (**Kerro Dego**)

11:30 No presentation

16. Effect of heat stress on adherence to and internalization of *Streptococcus uberis* into bovine mammary epithelial cell (**Almeida**)

11:45 Patronize food trucks for lunch – E.J. Chapman Drive

12:30 Plenary address: **Jonathan M. Irish**, PhD  
 “*Decoding tissue microenvironments using mass cytometry (CyTOF)*”  
 Hollingsworth Auditorium

\*PBB, Plant Biotechnology Building



## Session A—Clinical Sciences

Rm. PBB\* 160

## Session B—Infectious Diseases & Animal Science

Rm. PBB\* 156/157

- |      |   |  |   |
|------|---|--|---|
| 2:00 | 6. Associations among perceived motor competence, motor competence, physical activity, and health-related physical fitness of children ages 10–15 years old ( <b>Post</b> ) |  | 17. Phenotypic and genetic characterization of <i>Staphylococcus aureus</i> isolates from cases of bovine mastitis ( <b>Kerro Dego</b> )                                  |
| 2:15 | 7. Effect of fentanyl on the minimum infusion rate of propofol preventing movement in dogs ( <b>Davis</b> )   |  | 18. Variation of immune response to <i>Staphylococcus pseudintermedius</i> surface-exposed peptides among dogs with pyoderma ( <b>Abouelkhair</b> )                       |
| 2:30 | 8. Vesicopreputial anastomosis for treatment of obstructive urolithiasis in small ruminants ( <b>Cypher</b> )   |  | 19. Identification of <i>Staphylococcus pseudintermedius</i> sortase A inhibitors ( <b>Balachandran</b> )   |
| 2:45 | 9. Evaluation of the effect of oral omeprazole on serum electrolytes, cobalamin and bone mineral homeostasis in cats ( <b>Gould</b> )                                       |  | 20. Finished genome sequences of three dominant <i>Staphylococcus pseudintermedius</i> strains reveal differences in virulence and antibiotic resistance ( <b>Riley</b> ) |
| 3:00 | 10. Comparison of penetrating vs. non-penetrating captive bolt in horned goats ( <b>Collins</b> )   |  | 21. Feeding low crude protein diets in lactating dairy cows during summer months: Improvements in energy metabolism ( <b>Kaufman</b> )                                    |
| 3:15 | 11. Gadoxetate disodium (Eovist) contrast-enhanced magnetic resonance imaging characteristics of hepatocellular carcinoma in dogs ( <b>Constant</b> )                       |  | 22. Hen diet enriched in long chain n-3 polyunsaturated fatty acids reduces adiposity in chicks ( <b>Beckford</b> )   |

\*PBB, Plant Biotechnology Building

### To view abstracts:



# Tuesday, May 24

9:00 Invited address: **Suzie Allard**, MSLS, PhD  
"Mentoring & your career: Symbiosis is success"  
PBB\* 156/157

## Session C–Clinical Sciences

Rm. PBB\* 113

10:30 23. Subjects with and without osteoarthritis alter their muscle coordination to achieve beneficial knee moments while cycling (**Thompson**)

10:45 24. Biomechanics and anomalies in subadult bone development: A gateway to understanding fracture patterns in imperfect bone (**Tengelin**)

11:00 25. Evaluation of calcium deposition in calcified aortic heart valves using laser-induced breakdown spectroscopy (LIBS) (**Davari**)

11:15 26. Evaluation of pulse oximetry in healthy brachycephalic dogs (**Arulpragasam**)

11:30 27. Pelvic limb reflex changes in dogs with acute focal thoracolumbar myelopathy (**Hodshon**)

11:45 44. Intercanine distance as a statistical measure for bite mark analysis (**Ohana**)

## Session E–Infectious Diseases

Rm. PBB\* 156/157

33. *Staphylococcus pseudintermedius* efflux pump detection and characterization (**Millis**)

34. Commercially available citrus-based and Quillaja extracts to reduce Tulane virus titers (**Ailavadi**)

35. Use of mycophenolate mofetil to treat immune-mediated skin disease in 14 dogs–A retrospective evaluation (**Ackermann**)

36. Consideration of the fungal phosphatidylserine synthase as a drug target (**Cassilly**)

37. Decreased dissolved oxygen as a possible mechanism of increased persistence of *Trichomonas gallinae* in the presence of organic material (**Purple**)

No presentation

12:00 Patronize food trucks for lunch – E.J. Chapman Drive

12:15 Seminar: **Kurt Lamour**, PhD  
"Application of the MonsterPlex targeted sequencing technology and opportunities for collaborative research"  
Hollingsworth Auditorium

\*PBB, Plant Biotechnology Building



## Session D-Oncology & Cell Biology

Rm. PBB\* 160

## Session F-Infectious Diseases & Population Health

Rm. PBB\* 156/157

- |      |  |     |  |
|------|--|-----|--|
| 1:00 | 28. Detection of carcinogen-induced bladder cancer by fluorocoxib A in mice ( <b>Bourn</b> )   | 38. | Next generation sequencing and genomic analysis of <i>Tritrichomonas foetus</i> species of bovine and feline origin ( <b>Fleetwood</b> )   |
| 1:15 | 29. Reactive oxygen species-mediated synergistic and selective induction of cell death and reduction of clonogenic resistance in breast cancer cells by combined cisplatin and FK228 ( <b>Pluchino</b> ) | 39. | Identification and role of cysteine protease 30 in feline <i>T. foetus</i> : A novel target for preventive and/or therapeutic strategies for feline trichomonosis ( <b>Gould</b> ) |
| 1:30 | 30. The protease activity of separase is required for both chromosome segregation and membrane trafficking during anaphase ( <b>Bai</b> )  | 40. | Role of IL-28A in herpes stromal keratitis ( <b>Jaggi</b> )  |
| 1:45 | 31. Spatiotemporal regulation of Cdc42 coordinates cytokinetic events in <i>S. pombe</i> ( <b>Hercyk</b> )   | 41. | The role of resistance training in influencing insulin resistance among adults without diabetes: A systematic review and meta-analysis ( <b>Boyer</b> )                            |
| 2:00 | 32. Nicastrin is required for APP but not Notch processing, while Aph-1 is dispensable for processing of both APP and Notch ( <b>Hu</b> )  | 42. | Demographic predictors of pertussis vaccine receipt in Tennessee in all age groups, 2014 ( <b>Tandy</b> )  |
| 2:15 | No presentation  | 43. | Spatial patterns of myocardial infarction death risks in Florida between 2000 and 2014 ( <b>Odoi</b> )   |

**5:30** Awards Reception (Hollingsworth Auditorium)

\*PBB, Plant Biotechnology Building

**To view abstracts:**



# Featured Speakers



## **Susan Kutz, DVM, PhD**

*Associate Professor of Ecosystem Public Health  
Faculty of Veterinary Medicine  
University of Calgary*

### **Monday Keynote Address 9:00 am, PBB 156/157**

**“The critical role of wildlife health and food safety and security in the Canadian Arctic”**

**Dr. Susan Kutz** is a veterinary parasitologist and an expert in wildlife parasitology, disease ecology, ecosystem health, arctic ecology, climate change, and community-based disease surveillance. She completed her DVM at the Western College of Veterinary Medicine, University of Saskatchewan. After working as a veterinarian in the Canadian Arctic for several years, she returned to do a PhD in wildlife parasitology at the University of Saskatchewan. Following that, she was a post-doctoral fellow at the University of Alaska, Fairbanks, where she studied host-parasite associations in Beringia.

Dr. Kutz is a founding member of the Faculty of Veterinary Medicine at the University of Calgary. She also is the director of the Alberta Node of the Canadian Cooperative Wildlife Health Centre and a member of the Terrestrial Mammals Committee of the Committee on the Status of Endangered Wildlife in Canada.

Dr. Kutz’s research interests include understanding the impacts of climate and landscape change on host-parasite interactions in the Arctic. She has programs investigating parasite biodiversity, invasion processes, and the impacts of parasites on host populations, food safety, and food security. She has extensive international collaborations around the Arctic and has led a circumarctic caribou and reindeer health assessment program. In the Arctic, Dr. Kutz works closely with aboriginal hunters to monitor wildlife health and has maintained an NSERC-funded outreach program in the Canadian North since 2004. Her research interests in parasitology extend beyond the Arctic, where she also collaborates on studies in behavioral ecology and parasitism in non-human primates, wild ungulates, and carnivores.

# Featured Speakers

## **Jonathan M. Irish, PhD**

*Assistant Professor  
Department of Cancer Biology  
Vanderbilt University*

**Monday Plenary Address  
12:30 pm, Hollingsworth  
Auditorium**

**“Decoding tissue  
microenvironments using mass  
cytometry (CyTOF)”**



**D**r. Jonathan M. Irish's research is focused on measuring signaling events in individual cells from primary tissues, including human tumors.

Before going to Vanderbilt in December 2011, Dr. Irish trained at Stanford University with Garry Nolan (as a PhD student) and Ronald Levy (as a postdoc & instructor). There, he created a new approach that measures signaling in individual cancer cells and applied it to the study of acute myelogenous leukemia patient clinical outcomes. An advantage of this single cell approach is that signaling can be characterized in rare populations of cancer cells and contrasted with the bulk cancer cell population or with tumor-infiltrating, non-malignant cells.

He later applied this technique to healthy B cells and malignant B cells in follicular lymphoma. In follicular lymphoma, signaling identified a subset of tumor B cells that were present at diagnosis only in patients with a lower overall survival ( $P < .0001$ ) and that increased over time as the patient's cancer progressed.

Systems biology tools like Cytobank, a cloud computing platform Dr. Irish's team created to manage and analyze single cell signaling data, were critical to this work.

# Featured Speakers



## **Suzie Allard, MSLs, PhD**

*Associate Dean for Research, College of  
Communication and Information  
Professor, School of Information Sciences  
University of Tennessee*

***Tuesday Invited Address  
9:00 am, PBB 156/157***

**“Mentoring & your career:  
Symbiosis is success”**

**D**r. **Suzie Allard**’s research focuses on how scientists and engineers use and communicate information, particularly in the virtual environment and across distributed work teams. Current projects center on science data curation, interdisciplinary scientific work teams (particularly in terms of data sharing), and science information cybersecurity.

Allard is a member of the DataONE Leadership Team and the Board of Directors for the Networked Digital Library of Theses and Dissertations. She is PI or co-investigator on grants funded by the National Science Foundation, the Institute of Museum and Libraries Services, the Alfred P. Sloan Foundation, IEEE, and others. Allard has published numerous papers in peer-reviewed journals, spoken at venues around the world, and published several book chapters focused on data curation, data science, trust in online scholarly resources, and research evaluation. Allard received a bachelor’s degree in economics from California State University at Northridge, an MS in library and information sciences, and a PhD in communication from the University of Kentucky. Before her career in academe, Allard was the vice president of Research Frontiers Corporation, which provided creative consultation services to the entertainment industry.



# Featured Speakers

## **Kurt Lamour, PhD**

*Professor  
Department of Entomology  
& Plant Pathology  
Institute of Agriculture  
University of Tennessee*

**Tuesday Seminar  
12:15 pm, Hollingsworth  
Auditorium**

**“Application of the MonsterPlex  
targeted sequencing technology and  
opportunities for collaborative research”**



**D**r. Kurt Lamour is a professor of molecular epidemiology and specializes in genetic diversity and population biology of oomycete organisms with an emphasis on *Phytophthora*. His research program develops genetic tools for plant pathogens, including genome resources and molecular markers. He works closely with vegetable breeders to help find or develop resistant plants.

Lamour earned his PhD in botany and plant pathology from Michigan State University and was appointed to the faculty at the University of Tennessee in 2003.

Lamour developed MonsterPlex, a rapid, low-cost, targeted sequencing technology for large-scale genotyping and resequencing. Exploiting this inexpensive sequencing capacity for specialized or targeted applications, particularly when many samples are involved (for example, hundreds to thousands) is expensive. MonsterPlex is a PCR-based technology, developed at UT, to sequence multiplexed targets (tens to hundreds of targets) from hundreds to thousands of individuals at an overall low cost per target (as low as \$0.05/target at 20x coverage). The technology has been used for SNP genotyping in diverse organisms (humans, animals, plants, plant pathogens, and insects) and most recently was used to re-sequence entire RNA viral genomes (15 Kb total size).

His seminar will briefly overview current applications, describe an educational and research outreach program that makes MonsterPlex available (at cost) to the academic research community, and discuss opportunities for cross-disciplinary research collaborations.

# Food Trucks - Lunch Options

Food trucks will be parked on E.J. Chapman Drive alongside the Plant Biotechnology Building on both days of the symposium. Please patronize our vendors by purchasing lunch from them.



**Monday & Tuesday**  
From 11 to 1 pm  
Accept Debit and Credit Card

## Menu

**VIETGRILL**

**Soup of the Day \$4**  
Make fresh daily



**Egg Roll \$2 ea.**  
Cabbage, carrot, potatoes, onion, are wrapped in wonton skin and deep fry, serve with sweet chili sauce



**Spring Roll \$3 ea.**  
Jicama, carrot, basil, mint, cucumber, lettuce are wrapped in paper rice and dip in peanut sauce



**Singapore Noodle \$8.5**  
Stir fry rice noodle, mushroom, carrot, corn, bok choy, broccoli with curry sauce



**Banh Mi \$6.5**  
**Vietnamese Sandwich**  
Vegan Meat, cucumber, sweet carrot, cilantro, in crispy and crunchy Vietnamese bread



**Garden Fried Rice \$8.5**  
Stir fry rice, egg, carrot, pea, corn, green bean, broccoli, and our homemade fried rice sauce, serve with yummy sauce and sriracha



## Sample Menu



### Ribs

**Rib Snack \$9**  
4 Bones, 1 Side, and King Roll

### Smoked Pork

Add slaw to sandwich \$1.00

**Pork BBQ Sandwich \$8**  
1 Side

**3 Sliders \$9**  
1 Side

### Smoked Chicken Wings

Ranch, Sweet BBQ, Hot BBQ, Texas Pete

**6 Wings \$6**

**12 Wings \$10**

### Smoked Dogs

**Slaw Dog \$3**  
Slaw, Chili, Onion, Ketchup, Mustard

**Smokey Dog \$4**  
Pork BBQ, Slaw, Chili, Onion, Ketchup, Mustard

### Smoked Baked Potato

**Plain Potato \$5**  
Butter, Sour Cream

**Loaded Potato \$8**  
BBQ Pork, Chili, Sour Cream, Butter, Cheese

**\$2**  
Potato Salad  
Macaroni Salad  
**\$3**  
Cornbread Salad

Cole Slaw  
Baked Beans



# Awards Descriptions

## **Graduate Student Category**

Travel awards for the top 3 presentations.

1st Place – \$1,000

2nd Place – \$750

3rd Place – \$500

## **Intern/Resident Category**

Travel award for the top presentation.

\$1,000

## **Research Associate Category**

Travel award for the top presentation.

\$1,000

## **Phi Zeta Award for Excellence in Animal Health Research**

Top presentation representing Phi Zeta's goal to excel in scholarship and research in matters pertaining to the welfare and diseases of animals.

\$250

*Notes:*

*Notes:*

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- Urquhart, Cassandra, May 23, 10:30 AM, PBB 156/157
- Zayed, Mohammed, May 23, 10:45 AM, PBB 160

# ***Sponsor & Exhibitor Directory***

## **Fisher Scientific**

Amy H. Leonard

(865) 684-5798

amy.leonard@thermofisher.com

## **Pendergrass Library (Agriculture & Veterinary Medicine), UT**

Ann Viera

(865) 974-9015

annviera@utk.edu

## **UT Core Facilities**

Dr. Jonathan Phipps, Director

(865) 974-7181

jhipps@utk.edu

## **UT Federal Credit Union**

Hanna Gomez

(865) 971-1971 (Ext. 144)

hgomez@utfcu.org

## **UTIA Genomics Hub**

Sujata Agarwal

(865) 974-8597

sagarwal@utk.edu

## **UTIA Sponsored Programs Office**

Debbie Hampstead

(865) 974-7357

aggrant@utk.edu

**To enter to win door prizes, visit our exhibitors to get your card punched. Pick up a card at one of the symposium tables.**



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KNOXVILLE

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CORE FACILITIES



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ENGAGEMENT