



SCHEDULE OF PRESENTATIONS (Current as of March 3, 2014; subject to change)

THURSDAY AFTERNOON, MARCH 6, 2014

- | | |
|-------------------|--|
| 1:00 pm - 5:00 pm | Registration
2 nd Floor – Pre-Function Area |
| 3:00 pm – 4:00 pm | Business Meeting (All Attendees Invited)
Grand KY Ballroom – Salon D |
| 4:00 pm – 5:00 pm | IBE Executive Council Meeting
Grand KY Ballroom – Salaon A |
| 5:00 pm – 6:00 pm | Welcome Reception
Magnolia Junior Ballroom (1 st Floor) |
| 6:00 pm – 6:30 pm | Student Social
Magnolia Junior Ballroom (1 st Floor) |

FRIDAY AFTERNOON, MARCH 7, 2014

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|-------------------|---|
| 7:00 am – 8:00 am | Continental Breakfast
2 nd Floor Pre-Function Area |
| 8:00 am – 9:20 am | Opening Remarks/Keynote Address – Grand KY Ballroom A |
| 8:00 am | Opening Remarks
Dr. Marshall Porterfield, 2014 President of IBE |
| 8:10 am | Keynote Address: Microbial Biotechnology for Sustainable Resource Recovery
Dr. Craig Criddle
Department of Civil & Environmental Engineering
Woods Institute for the Environment
Stanford University |
| | Sponsored in part by Oak Ridge Associated Universities |
| 9:20 am – 9:30 am | Break |



9:30 am – 12:00 pm Four Concurrent Sessions

I. Sensors & Biosensors I – Grand KY Ballroom A

Chair: Dr. Eric McLamore, University of Florida

- 9:30 am A micro-biosensor for real-time monitoring of extracellular ATP
Diana C. Vanegas, University of Florida, Universidad del Valle; Masashige Taguchi, Eric McLamore, University of Florida; Greg Clark, Stanley Roux, University of Texas
- 9:45 am A pulsed sonoelectrodeposition platform for nanomaterial-mediated biosensor development
M. Taguchi, N. Garland, N. Schwalb, D.C. Vanegas, S.L. Burrs, E.S. McLamore, University of Florida
- 10:00 am Alignment of ellipsoidal particles under dielectrophoresis
Yu Zhao, Guigen Zhang, Clemson University
- 10:15 am Bio-inspired graphene nanosensing
Yue Cui, Utah State University
- 10:30 am Break
- 10:45 am CEL-C advanced bioCD: A Lab-on-a-Chip centrifuge platform for single-cell electrophysiology study
Joon H. Park, W. W. Amani Wan Salim, Purdue University; Antonio J. Ricco, Andres Martinez, Aaron Schooley, Bob Ricks, Abraham Rademacher, Josh Benton, NASA Ames; D. Marshall Porterfield, NASA Headquarters
- 11:00 am Detecting bacterial rot in Vidalia onions with computed tomography - A pilot study
Richard Speir, Mark A. Haidekker, University of Georgia
- 11:15 am Development of nanomaterial-mediated biochips for biofuel research
Stephanie Burrs, Diana Vanegas, Masashige Taguchi, Eric S. McLamore, University of Florida
- 11:30 am Flipping of pearl chains under dielectrophoresis in a flow condition
Yu Zhao, Guigen Zhang, Clemson University



II. Bioenergy: Algae-Based Systems I – Grand KY Ballroom D

Chair: Dr. Zivko Nikolov, Texas A & M University

- 9:30 am Anaerobic co-digestion of algal biomass and rich carbon source material to produce methane
Yousef Soboh, Ronald Sims, Darwin Sorensen, Utah State University
- 9:45 am Evaluation of algal biocathode performance in microbial desalination cells
Bahareh Kokabian, Veera Gnanaswar Gude, Mississippi State University
- 10:00 am Application of the rotating algal biofilm reactor for biomass cultivation and nutrient removal
Terence Smith, Ronald Sims, Utah State University
- 10:15 pm Life cycle assessment and techno-economic analysis of wastewater algae for electric and fuel production
Ronald Sims, Ashik Sathish, Terence Smith, Jason Quinn, Utah State University
- 10:30 am Break
- 10:45 pm Evaluation of sedimentation and vacuum assisted filtration on microalgae with polymeric flocculant addition.
Nicholas Rhea, Czarena Crofcheck, John Groppo, University of Kentucky
- 11:00 am Chitosan enhanced coagulation of algal turbid waters - Comparison between rapid mix and ultrasound coagulation methods
Sara Ann Fast, Veera Gnanaswar Gude, Mississippi State University
- 11:15 am Biomass and phycocyanin production from cyanobacterial biofilms cultured in produced water (Oilfield Wastewater) using a rotating algal biofilm reactor
Jonathan Wood, Ronald Sims, Jon Takemoto, Utah State University
- 11:30 am Comparison of Microwave and Ultrasound Effects on Enhanced Extractive-Transesterification of Algal Lipids
Edith Martinez-Guerra, Veera Gnanaswar Gude, Mississippi State University

III. Environmental Engineering: Environmental Complexity and Systems Issues – Triple Crown

Chair: Dr. Wen Zhang, University of Arkansas

- 9:30 am Assessing trichloromethane formation and control in nutrient enriched waters
Clinton A. Mash, Byron A. Winston, Ashley D. Pifer, J. Thad Scott, Wen Zhang, Julian L. Fairey, University of Arkansas.



- 9:45 am Determination of biofilm activity and species succession of *Thiobacillus sp.* on cement surface using non-invasive self-referencing microsensors
Liqu Cheng, Mitch W. House, W. Jason Weiss, Purdue University; M. Katherine Banks, Texas A&M University
- 10:00 am Development of mobile sensor technology for in-pipe water quality monitoring
Ruoxi Wu, Wan W. Amani Wan Salim, Muhammad Firdaus Razali, Joonhyeong Park, Aaron Brovont, Steven Pekarek, Purdue University; M. Katherine Banks, Texas A&M University; D. Marshall Porterfield, NASA Life and Physical Sciences.
- 10:15 am Manure and biosolid management practices to remove antibiotics and limit the promotion of antibiotic-resistance
Jeffrey L. Ullman, Ella L. Baar, University of Florida; Shannon M. Mitchell, Craig Frear, Washington State University
- 10:30 am Break
- 10:45 am Microbial community under the changing pre-oxidation regime at drinking water treatment plant
Connie Moloney, Wen Zhang, University of Arkansas; Sydney Noell, North Carolina A&T State University
- 11:00 am Novel flow cytometry based method to characterize microbial communities in complex environmental systems
Abhishek Dhoble, Sadia Bekal, William Dolatowski, Kaustubh Bhalerao, University of Illinois at Urbana-Champaign
- 11:15 am The impact of nitrogen to phosphorus ratio in nutrient removal from wastewater using algae
Johnnie Chamberlin, Courtney Hill, Connie Moloney, Wen Zhang, University of Arkansas.
- 11:30 am Towards bioengineered ecosystems - a graph theoretic and experimental investigation of contamination resistance in sourdough
Nico Hawley-Weld, Seokchan Yoo, Kaustubh Bhalerao, University of Illinois

IV. Metabolic Pathway Engineering – Bluegrass Ballroom

Chair: Dr. Ling Yuan, University of Kentucky

- 9:30 am Engineering high value oil production in plants and microbes
Joe Chappell, University of Kentucky



- 9:50 am Manipulation of metabolic pathway using the chimeric repressor in plants
Masaru Ohme-Takagi, Saitama University
- 10:10 am Pathway Pioneer: A web-based metabolic network layout tool for comprehensive visualization of complex networks
Harsh Dosi, Sumit Kumar Singh, Nicholas S. Flann, Utah State University; H. Scott. Hinton, Synthetic Biomanufacturing Institute
- 10:30 Break
- 10:45 am Functional metagenomics for gene discovery
Luke Moe, University of Kentucky
- 11: 05 am Engineered biosynthesis of plant polyphenols in Escherichia coli
Siyuan Wang, Utah State University
- 11:25 am Development of recombinant yeast strains for optimized fuel ethanol production
Joy Ghosh, Pat Heist, FermSolution, Inc.
- 11:45 am Roundtable discussion: Production platform - plants vs. microbes
- 12:00 pm – 2:00 pm LUNCH (on your own)**

FRIDAY AFTERNOON, MARCH 7, 2013

- 2:00 pm – 3:00 pm GENERAL SESSION: BioBusiness Nexus – Grand KY Ballroom A**
Chair and Moderator: Dr. Guigen Zhang, Clemson University

Panel Theme: *Perspectives from working in the trenches*

Panel Presentations

Building a small company while working as a basic scientist

Greg A. Gerhardt, Ph.D., Professor of Anatomy and Neurobiology, University of Kentucky Medical Center; Quanteon, LLC

The unique challenges and opportunities associated with commercializing a novel platform technology

Tom Hedman, Ph.D., Founder, General Partner and CSO, Orthopeutics, L.P.



Pseudo-iterative start-sp: Hummingbird Nano's story from the trenches
Eleanor Hawes, Ph.D., Principal Engineer/CRO, Hummingbird Nano, Inc.

We are still learning at 28...

Danika Lippert, MBA, MS, Human Resources and Commercialization, Biomedical Development Corporation

Sponsored in part by Oak Ridge Associated Universities



3:00 pm – 3:30 pm **Biological Engineering Collaboration Event – 2nd Floor Pre-Function Area**
Refreshment & Networking Break

3:45 pm – 6:00 pm **Four Concurrent Sessions**

I. Sensors and Biosensors II – Grand KY Ballroom A

Chair: Mark A. Haidekker, University of Georgia

- 3:45 pm Respiratory resistance before, during, and after exercise
Arthur T. Johnson, University of Maryland

- 4:00 pm Improved detection of metastatic melanoma with photoacoustic flow cytometry
Mark J. Messler, Erin N. Bax, Benjamin S. Goldschmidt, University of Missouri; John A. Viator,
Duquesne University

- 4:15 pm Noise reduction strategies for dual-energy computed tomography (CT)
Mark A. Haidekker, University of Georgia

- 4:30 pm Photoacoustic detection of *Escherichia coli* bacteria bells for screening of Septicemia
Calvin Irwin, Akia Parks, John Viator, University of Missouri

- 4:45 pm Potentiometric glycerol biosensor based on incorporation of glycerol-dehydrogenase on Au
using layer-by-layer self-assembled molecular wiring systems
Aishwarya Mahadevan, Duminda A. Gunawardena, Sandun Fernando, Texas A&M University

- 5:00 pm Break

- 5:15 pm Wire-guided droplet manipulation based quantitative PCR device towards food and veterinary
diagnostics
Scott V. Angus, Soohee Cho, Dustin K. Harshman, Jeong-Yeol Yoon, University of Arizona



5:30 pm Sensing flow with molecular rotors: A simple photobleaching effect?
Nikki Thai, Adnan Mustafic, Mark A. Haidekker, University of Georgia

5:45 pm Smartphone-based paper microfluidic detection of *E. coli* from field or waste water
Tu San Park, Jeong-Yeol Yoon, University of Arizona

Ila. Bioenergy: Algae-Based Systems II – Grand KY Ballroom D

Chair: Dr. Zivko Nikolov, Texas A&M University

3:45 am Effects of engineered nanoparticles on a microalgal strain *Cryptocodinium cohnii*
Robert Heusner, Yi Cui, Yanna Liang, Weilan Zhang, Samuel Ma, Southern Illinois University
Carbondale

4:00 pm Recovery and characterization of malarial vaccine self-conjugates (Pfs25) expressed in
Chlamydomonas reinhardtii
Katelyn Wilson, Neera Munjal, Rebekah Garcia, Andrea Garzon, Zivko Nikolov, Texas A&M
University

4:15 pm Production and recovery of a monoclonal antibody from green microalgae
Neera Munjal, Katelyn Wilson, Rebekah Garcia, Zivko Nikolov, Texas A&M University

IIb Bioenergy: Biochemical Conversions – Grand KY Ballroom D

Chair: Dr. Yanna Liang, Southern Illinois University Carbondale

4:45 pm Microbial oil produced from sweet sorghum bagasse
Kim Florence Jarosz, Yi Cui, Ji Zhang, Yanna Liang, Southern Illinois University Carbondale;
Ashley T. Wardlow, Florida International University

5:00 pm Effects of solids loadings in sodium hydroxide pretreatment and enzymatic hydrolysis of corn
stover
Alicia A. Modenbach, Sue E. Nokes, University of Kentucky

5:15 pm Sophorolipid production from renewable lignocellulosic biomass
Abdul Samad, Ji Zhang, Yanna Liang, Southern Illinois University Carbondale

5:30 pm Improvement of biofuel production by fungal pretreatment and periodic flushing system
Wanying Yao, Sue E. Nokes, Michael D. Flythe, Barbara L. Knutson, Bert C. Lynn, Stephen E.
Rankin, Mike Montross, University of Kentucky

5:45 pm New route to convert Illinois coal waste to clean energy fuel
Ji Zhang, Yanna Liang, Rohit Pandey, Satya Harpalani, Southern Illinois University Carbondale



III. Environmental Engineering: Ecological and Environmental Modeling – Triple Crown

Chair: Dr. Prem Parajuli, Mississippi State University

- 3:45 pm Assessing the impacts of climate change on fecal Coliform bacteria transport in the Big Sunflower River Watershed in Mississippi
Abdullah O. Dakhalla, Prem B. Parajuli, Mississippi State University
- 4:10 pm Climate change impact on bacteria transport process at watershed scale
Priyantha Jayakody, Prem B. Parajuli, John P. Brooks, Mississippi State University
- 4:35 pm Identifying genes that link with ecophysiology model parameters
Melanie Correll, Li Zhang, Subodh Acharya, C. Eduardo Vallejos, Jim W. Jones, Kenneth J. Boote, University of Florida; Wei Hou, Stony Brook University
- 5:00 pm Break
- 5:15 pm Modeling shallow groundwater nutrient discharge into a river under averaged river stage conditions
Ying Ouyang, USDA Forest Service Center for Bottomland Hardwoods Research

IV. Biological Engineering Design and Education – Bluegrass Ballroom

Chair: Dr. Czarena Crofcheck, University of Kentucky

- 3:45 pm Holistic waste stream management from residences with energy production and nutrient cycling through algal cultivation
Ben J. Stuart, R. Guy Riefler, Husam A. Abu Hajar, Derrick Fainbanks, Ohio University
- 4:00 pm Example of freshman biological engineering design projects
Alicia Modenbach, University of Kentucky
- 4:15 pm Equivalent system metrics as a tool in trade off studies for capstone design
Eric McLamore, University of Florida
- 4:30 pm Utilization of a feedback loop in the evaluation of design reports
Czarena Crofcheck, University of Kentucky
- 4:45 pm Maintaining necessary generalization in the biological engineering curriculum
Arthur T. Johnson, University of Maryland
- 5:00 pm Roundtable discussion: Needs in biological engineering discussion
- 6:00 pm Dinner – On Your Own**



SATURDAY MORNING, MARCH 8, 2014

7:00 am – 8:00 am **Continental Breakfast**
2nd Floor Pre-Function Area

8:00 am – 9:20 am **General Session:**
Showcasing Other Biological Engineering Societies - Grand KY Ballroom A

Hyunmin Yi, Korean Society of Biotechnology and Bioengineering and Department of Chemical and Biological Engineering, Tufts University

Lalit Verma, President of ASABE, Past-President of IBE, and Chair, University of Arkansas

Sponsored in part by Oak Ridge Associated Universities



9:30 am – 12:00 pm **Four Concurrent Sessions**

I. Synthetic Biology (iGEM) – Grand KY Ballroom A

Chair: Drs. Tom Richard, Pennsylvania State University & Meghdad Hajimorad, Eastern Washington University

- 9:30 am Characterizing quorum sensing orthogonality using a modular, *Escherichia coli*-based platform
Rene M Davis, Karmella A. Haynes, Arizona State University
- 9:50 am Secretion of biomaterials from *Escherichia coli* using a synthetic biological engineering approach
Asif Rahman, Ryan J. Putman, Ronald C. Sims, and Charles D. Miller, Utah State University
- 10:10 am Temperature dependence of nucleobase phosphorylation by a kinase ribozyme catalyst
Mackenzie K. Callaway, Raghav R. Poudyal, Phuong D. Nguyen, Donald H. Burke, University of Missouri - Columbia
- 10:30 am Break
- 10:50 am Expression of enzymes Carnitine dehydrogenase, CaiX, and CBCvw in *E.coli* demonstrate increased affinity for the uptake and breakdown of L-carnitine
Margaret S. Barbero, Will Dolatowski, Xinyi Guo, Rachel Walker, Blake Wilhelmsen, University of Illinois at Urbana-Champaign
- 11:10 am AMPed UP *E. coli*
Ryan J. Putman, Charles Barentine, Neal Hengge, Andrea Halling, Tyler Gladwin, Cody A. Tramp, Asif Rahman, Charles D. Miller, Utah State University; Kathleen M. Miller, Logan High School



11:30 am Genes to jeans: A green solution to blue denim
Bernardo Cervantes, Hojae Lee, Roy Park, Ramya Prathuri, Thomas Rich, Zach Russ, Christopher Eiben, Terry Johnson, John Dueber, University of California, Berkley

II. ASABE Perspectives of Biological Engineering - Grand KY Ballroom D

Chair: Dr. Mark R. Wilkins, Oklahoma State University

9:30 am The use of a novel biomass size reduction technique to prepare Eastern red cedar for ethanol production.
Mark R. Wilkins, Karthikeyan D. Ramachandriya, Oscar Pardo-Planas, Hasan K. Atiyeh, Nurhan T. Dunford and Salim Hiziroglu, Oklahoma State University

9:55 am Production of a fermentable sugar stream from woody biomass and agricultural residues
Danielle Carrier, University of Arkansas

10:20 am Break

10:45 am Fungal pretreatment of unsterilized lignocellulosic biomass for enhanced sugar yield and biogas production
Yebo Li, The Ohio State University

11:10 am A framework for rational design of optimal cellulose enzymes for biofuels production
Ganti Murthy, Deepak Kumar, Oregon State University

11:35 am An epidemic model for enzymatic hydrolysis of lignocellulosic biomass
Deepak Keshwani, Chao Tai, University of Nebraska

IIIa. Tissue & Cellular Engineering – Triple Crown

Chair: Dr. Angela Pannier, University of Nebraska

9:30 am Establishment of three-dimensional (3D) cell culture for *in vitro* evaluation of anti-cancer drugs
Audrey Adcock, Goral Trivedi, Rasheena Edmondson, Courtney Spearman, Jessica McKoy, Eric McCoy, Liju Yang, North Carolina Central University

9:50 am Rapid genetic identification of *Phanerochaete chrysosporium* during pretreatment of lignocellulose
Bobby Carey, University of Kentucky



- 10:10 am Telecommunications modeling of nonviral gene delivery
Timothy M. Martin, Beata J. Wysocki, Tadeusz A. Wysocki, Angela K. Pannier, University of Nebraska-Lincoln
- 10:30 am Break
- 10:45 am Peptoid inhibitors of amyloid-beta aggregation in Alzheimer's disease
Melissa A. Moss, Kelly A. Wilson, Lauren Wolf, University of South Carolina; J. Phillip Turner, Shannon L. Servoss, University of Arkansas

IIIb. Theoretical and Computational Biology – Triple Crown

Chair: Dr. Mark J. Uline, University of South Carolina

- 11:15 am Agent-based model for breast tissue culture development *in vitro*
Qanita Bani Baker, Nicholas S. Flann, Soonjo Kwon, Gregory J. Podgorski, and Ahmadreza Ghaffarizadeh, Utah State University
- 11:35 am Curvature and tension effects on the sorting of proteins in phase-separated model lipid bilayers
Mark J. Uline, University of South Carolina

IVa. Nanomaterials & Nanosystems – Bluegrass Ballroom

Chair: Dr. Adarsh Radadia, Louisiana Tech University

- 9:30 am Electronic control of nanopore conductivity and gating
Samuel Bearden, Guigen Zhang, Clemson University
- 9:50 am Detection and identification of charged species in a nanopore
Samuel Bearden, Guigen Zhang, Clemson University
- 10:10 am Fabrication of a pro-adhesive Surface using electrospun PCL nanofibers interspersed with peptide conjugated polystyrene particles
Ariana M. Nicolini, Celine M. Cohn, Marvin J. Slepian, Xiaoyi Wu, Jeong-Yeol Yoon, University of Arizona
- 10:30 am Break
- 11:05 am Nanodiamond-based structuring of biosensing electrodes
Adarsh Radadia, Wenli Zhang, Kush Patel, Shirin Banu, Andre Schexnider, Louisiana Tech University

12:00 pm – 1:45 pm LUNCH (on your own) & Poster Set-Up: Magnolia Jr. Ballroom, 1st Floor



1:45 pm – 2:45 pm **Committee Meetings:** Public Relations, Meetings, Membership, Student Activities

Communities Meetings: (Ecological Engineering, Biomedical Engineering, Biosensors and BioNano, Biological Systems Engineering, Education)

Various 2nd Floor Meeting Rooms – see posted signs

3:00 pm – 4:00 pm **General Session: Bioethics Essay Session** - Grand KY Ballroom A
Chairs: Drs. Praveen Kolar, NC State University and Lisa Wilken, Kansas State University

3:05 pm Helices and ladders: Impacts on ethics of the future professional world of biological engineers
Sean Bedingfield, Utah State University

3:15 pm Biodefense: Looking back and moving forward
Emma Brace, Kansas State University

3:25 pm Neuroethics essay
Kayla Henderson, University of Missouri

3:35 pm Almost human
Garret Hull, University of Missouri

3:45 pm Bioethical Implications of Personal Genome Sequencing
Hilary Schmidt, University of Missouri

4:00 pm – 6:00 pm **Poster Session & Reception (see below for poster presentation details)**
Chair: Dr. Meghdad Hajimorad, Eastern Washington University
Magnolia Jr. Ballroom, 1st Floor

6:30 pm – 8:30 pm **Awards Banquet**
Grand KY Ballroom A



POSTER PRESENTATIONS

Chair: Dr. Meghdad Hajimorad, Eastern Washington University

GENERAL POSTER SESSION

- 1. Degradation of volatile fatty acids from food wastes and electricity production in a microbial fuel cell**
Manzo Oba, M. Takaya, Nihon University
- 2. Initiation of nitrification in facultative aerobic lagoon to solve the problem of struvite sormation**
Neeraj Nagpal, Texas A&M University; John Campbell, Eric Rodriquez, Herman Bergen, Steven Esparza; Hilmar Cheese Company; Muthu Ramanathan, South Dakota State University, Carmen Gomes, Texas A&M University
- 3. Pathway Pioneer: a tool for metabolic network visualization and flux analysis**
Sumit Kumar Singh, Harsh Dosi, Vipul Oswal, Nicholas S. Flann; H. Scott. Hinton, Synthetic Biomanufacturing Institute
- 4. Progress towards eradicating foodborne disease: Rapid immunomagnetic capture of human norovirus virus-like particles**
Jessica Jenkins Broglie, Liju Yang, North Carolina Central University
- 5. Paper microfluidics for red wine tasting**
Tu San Park, Cayla Baynes, Jeong-Yeol Yoon, University of Arizona
- 6. Rapid and reagentless detection of microbial contamination within meat utilizing a smartphone-based biosensor**
Pei-Shih Liang, Tu San Park, Jeong-Yeol Yoon, University of Arizona

UNDERGRADUATE STUDENT POSTER COMPETITION SESSION

- 7. Changing plasmid copy number by mutation of the pMB1 origin of replication**
Erich Baker, Laurie Heyer, A. Malcolm Campbell, Davidson College; Brandon Grieshaber, Jeffrey Poet, Todd Eckdahl, Missouri Western State University
- 8. Evaluation of microbial disinfection through silver nanoparticle coated ceramic cater filters in rural South Africa**
James Smith, Rebecca Dillingham, Marianne Baernholdt, Beeta Ehdaie, Carly Krause, Maya Wright, University of Virginia; Courtney Hill, University of Arkansas; Oliver Haugland, Marquette University; Vivien Riviera, University of Oklahoma
- 9. Examination of nitrogen to phosphorus ratio in nutrient removal from wastewater through *Chlorella vulgaris***
Courtney Hill, Johnnie Chamberlin, Wen Zhang, University of Arkansas



- 10. Fitness and biosensor modules for programmed evolution**
Spencer Chadinha, Phoebe Parrish, Laurie Heyer, A. Malcolm Campbell, Davidson College; Sara Pearson, Jeffrey Poet, Todd Eckdahl, Missouri Western State University
- 11. Junction Golden Gate assembly for introduction of variation into genetic circuits**
Sachith Polpitya Arachchige, Jeffrey Poet, Todd Eckdahl, Missouri Western State University; Jessica Gronniger, A. Malcolm Campbell Davidson College
- 12. Optimized Environmental Conditions for Germination of *C. Richardii* Spores in Space**
P. F. Argote Corrales, Birck-Bindley, H. Park, W. W. A. Wan Salim, J. L. Rickus, Purdue University; D. M. Porterfield, Purdue University and NASA Headquarters
- 13. Production and purification of antimicrobial peptides in *E. coli* using synthetic biology**
Ryan J. Putman, Charles Barentine, Neal Hengge, Andrea Halling, Tyler Gladwin, Cody A. Tramp, Asif Rahman, Charles D. Miller, Utah State University; Kathleen M. Miller, Logan High School
- 14. Structure-based drug design of novel HIV-1 Rnase H inhibitors**
Hilary Schmidt, Karen Kirby, Quiongying Yang, Zhengqiang Wang, Stefan G. Sarafianos University of Missouri, Columbia; Michael A. Parniak, University of Pittsburgh
- 15. Using stress-responsive promoters to detect stressors of theophylline production in *E. Coli***
Jessica Gronniger, Dr. Malcolm Campbell, Davidson College.
- 16. Vapor-phase deposition and silane functionality to address issues in silane Capping of ZnO nanoparticles for use in neurological disorder treatment**
Sean Bedingfield, Kyle Isaacson, Rachael Mansell, Taylor Robins, David W. Britt, Utah State University

GRADUATE STUDENT POSTER COMPETITION SESSION

- 17. A 3D agent-based model of the transition from ductal carcinoma *in situ* to invasion**
Qanita Bani Baker, Nicholas S. Flann, Soonjo Kwon, Gregory J. Podgorski, Ahmadreza Ghaffarizadeh, Utah State University
- 18. Algae-based sustainable house**
Husam A. Abu Hajar, Derrick Fairbanks, R. Guy Riefler, Ben J. Stuart, Ohio University
- 19. Anaerobic digestion optimization through elemental feedstock characterization**
Derrick Fairbanks, Husam A. Abu Hajar, R. Guy Riefler, Ben Stuart, Ohio University
- 20. Gapped-duplex structure to label-free mismatch detection of pathogen DNA on solid substrate**
Spencer Eugene Williams, Renny Edwin Fernandez, Ruizhen Li, Anhong Zhou, Utah State University



21. ***In vivo* binding characteristics of polysaccharides and bacterial cellulose**
Alyssa Henning, Jeffrey Catchmark, Penn State University
22. **Integration of biological kinetics and computational fluid dynamics to model growth of *Nannochloropsis salina* in an open pond raceway**
Stephen Y. Park, Yebo Li, The Ohio State University
23. **Mechanistic insight into polyphenol inhibition of amyloid- β^2 aggregation in Alzheimer's disease using NMR**
Zeb Vance, Yiyang Wang, Perry Pellechia, Melissa Moss, University of South Carolina
24. **Monitoring ion flux in single cells: Planar patch clamp**
J. Park, J. Rickus and D.M. Porterfield
25. **Optimization of *P. chrysosporium* during solid state pretreatment**
Amanda Hickman, University of Kentucky
26. **Production of Polyhydroxyalkanoates in *Escherichia coli* from alternative carbon sources**
Asif Rahman, Ryan J. Putman, Ronald C. Sims, Charles D. Miller, Utah State University
27. **Up regulation of Heat Shock Protein 70A (HSP70A) in *Chlamydomonas reinhardtii* via internal promoter and SSA transformation**
Kirtley Amos, Jozsef Stork, Seth DeBolt, Czarena Crofcheck, University of Kentucky