



**5<sup>th</sup> Annual Applied Polymer Technology  
Extension Consortium Symposium**



***The University of Southern Mississippi***

**Hattiesburg, MS**

**November 13<sup>th</sup>, 2017**

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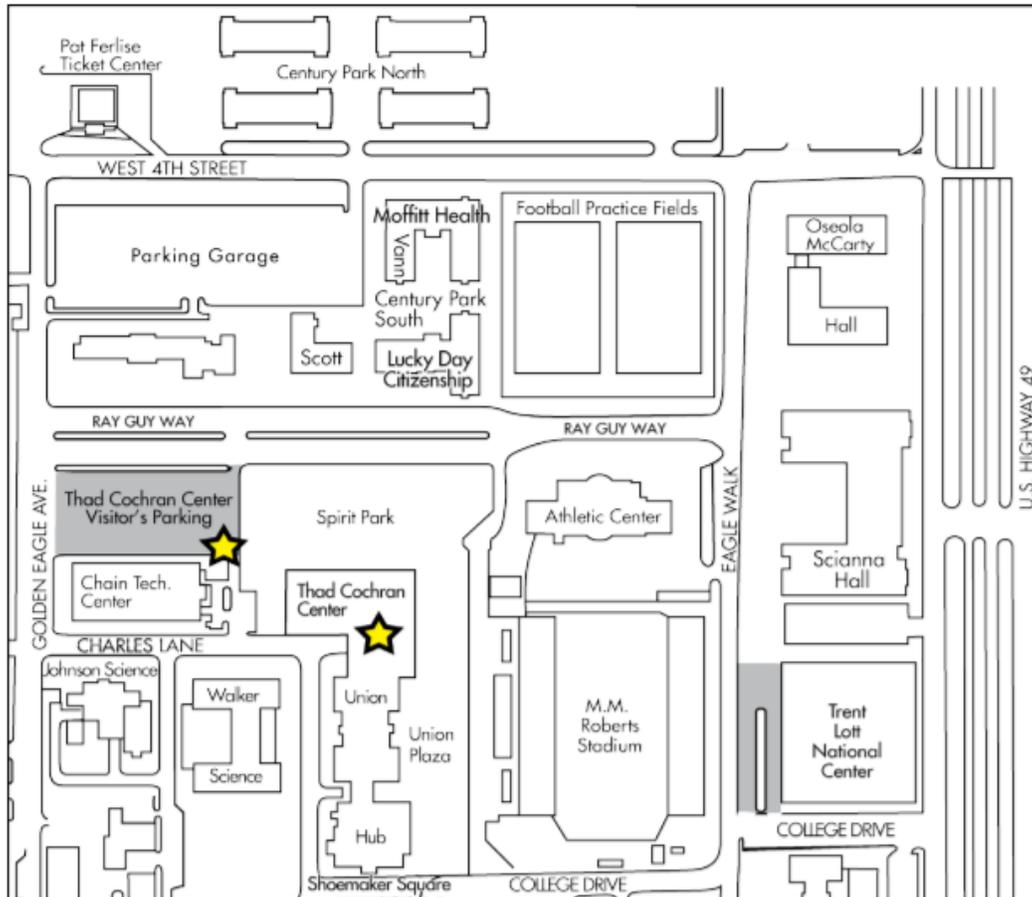
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## Campus and Parking Maps

### **Thad Cochran Center (TCC)**

121 Ray Guy Way  
Hattiesburg, MS 39406



### Directions

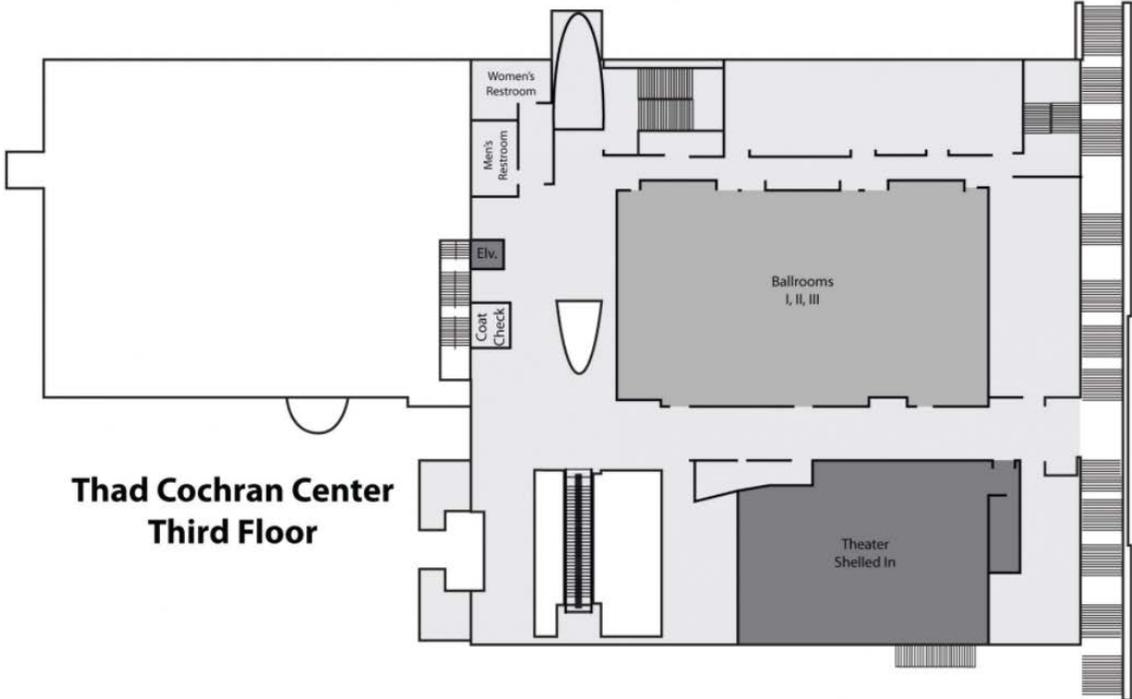
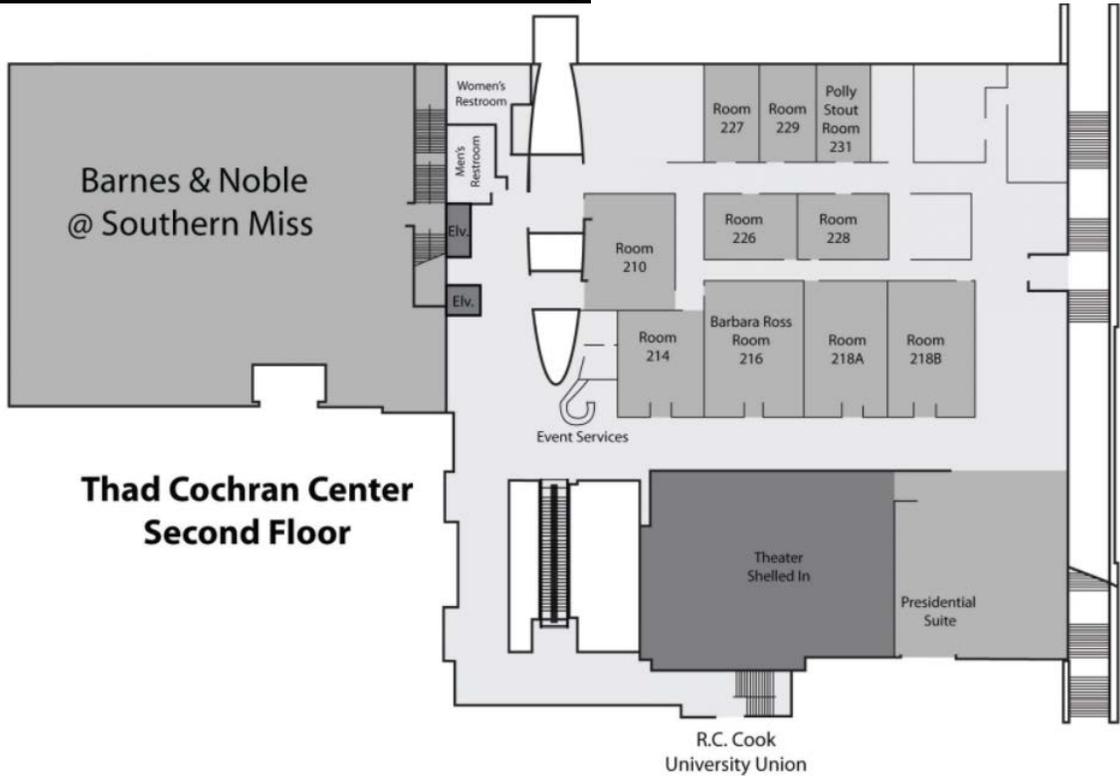
#### Traveling from Jackson on Hwy 49 S

- Less than one mile after traveling under I-59, look for a sign on the right showing Exit to the Coliseum and 4th Street.
- On Hwy 49, take the West 4th Street Exit (follow signs to Coliseum). Turn left on service road.
- Take right onto West 4th Street.
- On West 4th Street, take left at first traffic light onto Golden Eagle Avenue.
- Take third left into the Visitor's Parking Lot.

#### Traveling on Hwy 49 N

- At the Hwy 49/Hardy Street intersection, turn left onto Hardy Street.
- Take immediate right onto Service Drive.
- Follow Service Drive to traffic light.
- Take left onto West 4th Street.
- On West 4th Street, take left at first traffic light onto Golden Eagle Avenue.
- Take the third left into the Visitor's Parking Lot

**Thad Cochran Center (TCC) Map**



## Directions to Southern Prohibition Brewery (Social Venue)

**\$10 ticket includes 2 drink tickets from Southern Prohibition Brewery and pizza and salad bar provided by Mercury Pizza!**

**Address:** 301 Mobile Street, Hattiesburg, MS, 39401

### **Directions Starting from USM:**

- Head towards the stoplight on 4<sup>th</sup> street
- Turn right on 4<sup>th</sup> street, continue for 2.3 miles
- Turn Right of Mobile Street
- Southern Prohibition will be on the left-hand side on the corner of Mobile and E. 2<sup>nd</sup> Street



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## **Itinerary**

<b>Registration and Breakfast</b>	<i>(TCC Ballroom I)</i>	<b>8:00am-8:45am</b>
<b>Introductory Remarks</b>	<i>(TCC Ballroom I)</i>	<b>8:45am-9:00am</b>
Derek Patton, The University of Southern Mississippi Paul S. Russo, Georgia Institute of Technology		
<b>Oral Presentations</b>	<i>(TCC 216)</i>	<b>9:00am-10:00am</b>
1. Michael Sims, University of Florida 2. Louis Reisman, The University of Alabama 3. Alex London, The University of Southern Mississippi		
<b>Poster Session 1</b>	<i>(TCC 218)</i>	<b>10:00am-11:00am</b>
<b>Oral Presentations</b>	<i>(TCC 216)</i>	<b>11:00am- 12:00pm</b>
1. Douglas Amato, The University of Southern Mississippi 2. Aaron Alford, University of Alabama at Birmingham 3. Richard Cooke, The University of Southern Mississippi		
<b>Lunch Buffet</b>	<i>(TCC Ballroom I)</i>	<b>12:00pm-1:00pm</b>
<b>Poster Session 2</b>	<i>(TCC 218)</i>	<b>1:00pm-2:00pm</b>
<b>Oral Presentations</b>	<i>(TCC 216)</i>	<b>2:00pm-3:20pm</b>
1. Phillip Pickett, The University of Southern Mississippi 2. Indika Chandrasiri, University of Mississippi 3. Pradipta Das, The University of Southern Mississippi 4. Yiming Yang, University of Alabama at Birmingham		
<b>Keynote Speaker</b>	<i>(TCC Ballroom I)</i>	<b>3:20pm-4:00pm</b>
Timothy White, Air Force Research Lab		
<b>Career Panel</b>	<i>(TCC Ballroom I)</i>	<b>4:00pm-5:00pm</b>
Timothy White, AFRL Rebecca Parkhurst, U.S. GAO Monica Tisack, MPI Lu Lu, LAMG		
<b>Social</b>		<b>5:30pm-7:30pm</b>
Southern Prohibition Brewery		

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## **Abstracts for Oral Presentations**

***First Session (9:00am-10:00am)***

### **Harnessing Imine Diversity to Tune Polymer Degradation**

*Michael Sims, University of Florida*

Dynamic-covalent chemistry has enabled the facile synthesis of a new generation of degradable materials, but controlling the rate at which these materials degrade remains elusive. Using segmented hyperbranched polymers (SHPs) as model branched architectures, we demonstrate that SHPs containing imine crosslinks degrade under acidic conditions into well-defined linear chains at rates controllable via modification of the imine N-substituent. Imine-crosslinked SHPs were synthesized in a one-pot protocol by reversible addition-fragmentation chain transfer (RAFT) copolymerization of novel divinyl compounds containing dynamic-covalent oxime, semicarbazone, and acyl hydrazone moieties. The extent of SHP branching could be controlled through the relative stoichiometric ratios of crosslinker and chain transfer agent (CTA), and studies of the polymerization kinetics confirmed the growth of polydisperse branched species at high monomer conversions. When subjected to aqueous acidic conditions, the polydisperse branched architecture degraded into well-defined polymers, a process that was accelerated under more strongly acidic conditions and by incorporating less hydrolytically stable imines into the crosslinks. Finally, we found that the rate of SHP degradation could be tuned with an unprecedented level of control by crosslinking the polymers with different proportions of multiple imines.

### **The Anionic Ring-Opening Polymerization of Azetidine**

*Louis Reisman, The University of Alabama*

Although similar to many AROP capable monomers, cyclic amines do not undergo anionic polymerizations. For example, aziridine and azetidine only polymerize through cationic ring-opening polymerization (CROP) and produce hyperbranched polymers with broad molecular weight distributions. Building upon the progress made with N-(sulfonyl)aziridine polymerizations, we now report the first example of the AROP of an activated azetidine. N-(methanesulfonyl)azetidine (MsAzet) undergoes anionic polymerization at high temperature ( $>100\text{ }^{\circ}\text{C}$ ) in DMSO to form p(MsAzet). However, unlike the sulfonylaziridine systems, light branching of p(MsAzet) does occur, although the mechanism for branching is very different from what occurs in CROPs of aziridine and azetidine. The kinetics of the polymerization of MsAzet are also studied.

### **Rational Design of a High-Spin ( $S = 1$ ) Conjugated Polymer**

*Alex London, The University of Southern Mississippi*

High-spin ( $S \geq 1$ ) organic molecules contain weakly interacting unpaired electrons which exhibit intrinsic magnetic, spintronic and quantum phenomena, but are limited by their stability. New design guidelines for stabilizing these materials, allow for synthetic manipulation, and combine their properties with the optical and electrical characteristics of organic semiconductors are desired for enabling next-generation technologies. Here, we demonstrate a modular synthetic approach for generating an air-stable high-spin organic semiconductor. The extended  $\pi$ -system, planarization of the polymer backbone, and cross-conjugated ferromagnetic coupling units coalesce to invert the singlet-triplet energy levels, affording a neutral ground state triplet ( $S=1$ ). Superconducting quantum interference device (SQUID) magnetometry and electron spin resonance (ESR) indicate antiferromagnetically interacting polymer chains exhibiting a high-to-low spin gap ( $\Delta_{\text{EST}} = \text{of } 9.30 \times 10^{-3} \text{ kcal mol}^{-1}$ ). We demonstrate new synthetic guidelines for accessing stable, high-spin organic semiconductors with intrinsic magnetic properties and unique spin-spin interactions.

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**Second Session (11:00am-12:00pm)**

**Thiol-ene Photopolymerization in Droplet Based Microfluidics**

*Douglas Amato, The University of Southern Mississippi*

We demonstrate the utility of thiol-ene photopolymerizations as a simple and efficient tool to fabricate multifunctional materials within highly controlled droplet based microfluidics. Thiol-ene chemistry was used to fabricate complex microparticles with even greater loading capacity (90%) and conversion dependent release kinetics of omniphilic dyes. Microparticles cured at high conversion (90%) resulted in long-term retention of dyes (>30 days) while low conversion resulted in rapid release (minutes). We have incorporated degradable anhydride linkages within the thiol-ene shell to afford a fully degradable microparticle with delayed release. Lastly, we have developed a continuous photopatterning device for the production of hemi-spherical microparticles. The thiol-ene chemistry demonstrated can be widely applied in designer emulsions in which rapid curing and easy incorporation of new polymeric backbones is necessary.

**Ultrasound Guided Multilayer Polymer Capsules for Drug Delivery**

*Aaron Alford, University of Alabama at Birmingham*

The ability to see drug carriers in their administered environment in real time and to release the drug in a controlled, minimally invasive manner are hallmarks of an advanced drug delivery system. However, the nature of non-invasive imaging modes and structural requirements for controlled cargo release mean that imparting such capabilities to materials is not done easily. By focusing the precise control and flexibility of the layer by layer approach on the aim of maximizing the utility of an imaging-guided drug delivery system, we developed an approach that meets these challenges. Moreover, we characterized some relevant fundamental properties of several multilayer systems and their effects on the system's response to ultrasound. We present ultrasound-sensitive multilayer capsules composed of hydrogen-bonded polyphenol tannic acid (TA) and poly(N-vinylpyrrolidone) (PVPON) which are capable of encapsulating and delivering the anticancer drug doxorubicin. The labile nature of hydrogen bonds as structural elements of the capsule shell coupled with the mechanical force and cavitation effects of ultrasound allows perforation of the capsule shell and subsequent release of encapsulated doxorubicin at two distinctly different ultrasound intensities. We show that doxorubicin delivered from ultrasound treated capsules resulted in over 95% cytotoxicity to MCF-7 breast cancer cells and that no significant death occurred in cells incubated with unloaded and non-treated controls. Employing 1 MHz ultrasound with  $<1 \text{ mW/cm}^2$  intensity facilitated characterization of imaging contrast according to the thickness/size ratio of the shell and the local rigidity of the polymer. The controllable imaging sensitivity and drug release of this system provides a solid, expandable groundwork for design of diagnostic and therapeutic ultrasound sensitive multilayer encapsulation strategies.

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## **A Composite Matrix by Azide-Alkyne Cycloaddition**

*Richard Cooke, The University of Southern Mississippi*

Since the inception of carbon fiber-reinforced polymers (CFRPs) they have steadily gained in popularity due to their light weight, high tensile strength and modulus, and environmental toughness. However, curing of CFRPs of the thermosetting type generally must be performed within an autoclave, whose fixed, physical dimensions effectively limit the maximum size of the part. Alternative curing chemistries may potentially eliminate the requirement for an autoclave, which would allow creation of much larger panels. This project seeks to develop a thermoset composite matrix that is radiation-curable using the Cu(I)-catalyzed azide-alkyne cycloaddition (CuAAC) click reaction. Previously, Storey et al. reported that the azide-modified epoxy resin, di(3-azido-2-hydroxypropyl) ether of bisphenol-A (DAHP-BPA), could be cured by reaction with polyfunctional alkyne crosslinkers under mild conditions using Cu(I) catalysis. In the absence of reducing agents, Cu(II) compounds are catalytically inactive; however, upon exposure to ultraviolet light, they are reduced to Cu(I), which then catalyzes the reaction, allowing it to progress to a high degree of cure at room temperature. Herein, we report the kinetics of photo-induced CuAAC polymerization of the DAHP-BPA and several polyfunctional propargyl amine based crosslinkers, monitored by real-time FTIR as well as mechanical properties of fully cured materials. Polymerizations were studied as a function of Cu(II) compound type, Cu(II) concentration, UV light (365 nm) intensity, and duration of irradiation.

### ***Third Session (2:00pm-3:20pm)***

#### **“Polysoaps” via RAFT Copolymerization Forming Well-Defined, Unimeric Micelles for Water Remediation and Targeted Drug Delivery**

*Phillip Pickett, The University of Southern Mississippi*

Research in the area of stimuli-responsive amphiphilic (co)polymers continues to grow at a remarkable rate, largely due to the plethora of synthetic methods and “tools” available to polymer chemists. The impetus for this activity arises from the behavioral characteristics in water, as well as the biological relevance of these architecturally advanced systems for biomedical, pharmaceutical, and environmental applications. Structurally-tailored, statistical amphiphilic copolymers or “polysoaps” can self-assemble into single-chain or unimeric micelles, eliminating any concentration dependence on domain formation. Such micelles offer vast potential for dispersion of hydrophobic molecules in water at high dilution, making them desirable candidates for novel water remediation and targeted drug delivery technologies. Our group has synthesized a number of these “polysoap”-type copolymers utilizing reversible addition-fragmentation chain transfer (RAFT) polymerization, which provides control over molecular weight and gives narrow molecular weight distributions. Controlling the hydrophobic monomer content along the copolymer backbone allows the study of solution properties including those pertaining to micelle formation and hydrocarbon sequestration in aqueous media. Additionally, we can statistically incorporate stimuli-responsive co-monomers to determine the reversibility of micelle-to-unimer or micelle-to-aggregate phase transition behavior in response to external stimuli, including pH or CO<sub>2</sub>. This presentation will highlight current research efforts in our labs to synthesize and characterize “polysoap”-type copolymers as hydrocarbon dispersants that can, conceptually, circumvent several limitations of classical water remediation and drug delivery technologies.

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## **Synthesis and Characterization of Linear-Dendritic Block Copolymers (LDBC) as Next Generation Biomaterials**

*Indika Chandrasiri, University of Mississippi*

Dendrimers comprised of heterogeneous polymeric segments (e.g., hydrophobic and hydrophilic) afford multiple properties in a single molecule. Such dendrimers are described as “Janus type” and can be obtained by coupling two dendrons—possessing chemically different properties—to a single core. A unique property exhibited by these Janus dendrimers is the formation of various types of nanoparticles in aqueous media, depending on the ratio between the heterogeneous polymeric segments. However, lack of synthetic feasibility has hindered the widespread adoption of Janus dendrimers in drug delivery literature. In addition, they suffer from poor solubility and cytotoxicity—limiting clinical application. Alternatively, linear-dendritic block copolymers (LDBC) combine the advantageous properties of dendritic polymers with that of linear copolymers to afford nanomaterials with superior mechanical properties. Contrasting the basic architecture of LDBC to that of traditional block copolymers and phospholipids, their branched topology allow for guest-molecule entrapment while multiple head groups impart tailored, multivalent functionalities (e.g., targeted ligands and stimuli-responsive properties). Likewise, the linear segment of the copolymer provides excellent mechanical stability due to random-coil chain entanglements. Herein, we report the analysis of a library of polymers analogous to Janus dendrimers, known as Janus linear-dendritic hybrids. This combines the advantages regarding drug uptake and release of dendritic systems with the synthetic accessibility and precise molecular weight control of traditional polymerization techniques. In conjunction with microscopy (e.g., TEM and AFM), spectroscopic and light scattering techniques afford evidence of nanoparticle formation. The mean diameters of the nanoparticles formulated at concentrations of 1-10 mg/mL ranged between 30-300 nm. The size of the nanoparticles depend on the formulation method employed. Results of the study suggest materials applicable as next generation drug delivery systems.

## **Glycopolymer Brush as a Model to Investigate the Effect of Saccharide Structure on Peptide Aggregation Utilizing QCM and AFM in Tandem**

*Pradipta Das, The University of Southern Mississippi*

Saccharide crowding has been reported to have major effects on protein aggregation, including that of the amyloid- $\beta$  peptide implicated in Alzheimer’s disease. The mechanism and structural effects of saccharide-induced A $\beta$  aggregation are not well understood. Glycopolymer brushes containing stereo-controlled saccharides of glucose and galactose as pendant groups were synthesized on silicon surfaces via a facile UV photopolymerization technique and utilized as in vitro models. Here the brushes mimic the saccharide clusters of gangliosides which are present on cell surfaces. Quartz crystal microbalance with dissipation monitoring (QCM-D) and atomic force microscopy (AFM) were utilized in tandem to investigate the kinetics and process of A $\beta$  peptide assembly in the presence of glycopolymer brushes. Large fibrillar aggregates which grow from nucleation centers were observed in the presence of the galactose containing brush. However, small spherical aggregates, apparently oligomers of A $\beta$  which are known to have high neurotoxicity, were observed in the presence of the glucose containing brush.

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## **pH-Dependent Release of Anticancer Drug Doxorubicin from Biocompatible Thermoresponsive**

*Yiming Yang, University of Alabama at Birmingham*

Vesicles made from synthetic amphiphilic ABA triblock copolymers are promising for biomedical applications due to their stability, customizable size, and potential for stimuli-responsive properties. Among stimuli-responsive polymeric vesicles (polymersomes), those self-assembled at room temperature and pH/thermoresponsiveness in biologically relevant temperature and pH conditions are particularly well suited for applications in therapeutic delivery. We report on novel non-toxic amphiphilic triblock copolymer polymersomes with pH-triggered release and temperature-controlled permeability at the physiologically relevant temperatures. Our poly(N-vinylcaprolactam)10-poly(dimethylsiloxane)65-poly(N-vinylcaprolactam)10-(PVCL10-PDMS65-PVCL10) copolymer was able to assemble into a stable vesicle structure at room temperature and is capable of encapsulating the therapeutic model drug doxorubicin. The polymersome diameter was shown to decrease from 480 to 110 nm within 5 hours of hydrolysis at pH 4, which occurred in parallel to fast drug release as compared to non-stimuli responsive polymersomes. The biocompatibility of the polymersomes was evaluated via in vivo studies including necropsy analysis, histological imaging, and hematological analysis. The in vivo studies showed strong agreement in terms of biocompatibility which supports the potential use of our system for prolonged therapeutic delivery. Considering their biocompatible nature and high loading capacity, these polymer vesicles have considerable potential as novel stimuli-responsive drug nanocarriers.

### **Notes**

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## **Titles of Poster Presentations**

***Graduate Students/Post-Docs Session 1*** ***(10:00am-11:00am)***

1. **Design and Fabrication of Polymer Vesicles from Crosslinkable Linear Amphiphilic Triblock Copolymers**  
*Tamuka Chidanguro, The University of Southern Mississippi*
2. **Frontal Polymerization of Deep Eutectic Solvents Containing Acrylic and Methacrylic Acids**  
*Kylee Fazende, Louisiana State University*
3. **Post-Polymerization Modification of Styrene-Maleic Anhydride Copolymer Brushes**  
*Dr. Wei Guo, The University of Southern Mississippi*
4. **Donor-Acceptor Polymers with Tunable Infrared Photoresponse**  
*Lifeng Huang, The University of Southern Mississippi*
5. **Chemical Oscillating Particles Through Encapsulation of the Urea-Urease Reaction**  
*Anthony Mai, Louisiana State University*
6. **Manipulation of Thermal and Optoelectronic Properties via Compositional Control in Polythiophene Statistical Copolymers**  
*Michael Minkler, Auburn University*
7. **Effect of Energetically Inert Microspheres on Glassy Polymer Network Formation and Mechanics**  
*Travis Palmer, The University of Southern Mississippi*
8. **Thiol-Ene Networks Containing Perfluorinated and Poly(ethylene glycol) Moieties and their Effects on Gas Transport Properties**  
*Ramesh Ramakrishnan, The University of Southern Mississippi*
9. **Tailoring the Composition of Conjugated Polymer Blends for High Contrast Black-to-Transmissive Electrochromism**  
*Lisa Savagian, Georgia Institute of Technology*
10. **Well-Defined Polypeptides via Interfacial Ring-Opening Polymerization of Amino-Acid-Derived-N-Thiocarboxyanhydrides**  
*David Siefker, Louisiana State University*
11. **Heterobifunctional Linear-Dendritic Block Copolymers (LDBC)s as Multifunctional Carriers for Targeted Drug Delivery**  
*Briana Simms, University of Mississippi*
12. **Electrical Conductivity and Seebeck Coefficient of Air-Stable N-type Polymer Composite Films**  
*Tabitha Sutch, The University of Alabama*

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13. **Radical-Induced Cationic Frontal Polymerization of Vinyl Ethers**  
*Baylen Thompson, Louisiana State University*
14. **Thin Film Phase Behavior and Domain Spacing of Ternary Homopolymer/Block Copolymer Blends**  
*Md Fakar Uddin, Tulane University*
15. **Synthesis of Novel Water Soluble Semiconducting Polyrhodamine**  
*Ranganath Wahalathantrige Don, Mississippi State University*
16. **Poly(4-vinylpyridine)-b-Polyisoprene-b-Poly(4-vinylpyridine) Triblock Copolymer based Thermoplastic Elastomer: Synthesis and Characterization**  
*Huiqun Wang, University of Tennessee, Knoxville*
17. **Fine Tuning of Block Copolymer Phase Separation Behavior by Selective Infiltration of Ionic Liquids**  
*Le Zhang, Louisiana State University*
18. **Barrier and Mechanical Properties of Crosslinked PVOH Films**  
*Xujun Zhang, Georgia Institute of Technology*

**Undergraduate Students Session 1 (10:00am-11:00am)**

19. **Microwave Assisted Palladium(II) Acetate Catalyzed Acylative Cleavage of Cyclic and Acyclic Ethers Under Neat Conditions**  
*Shreya Bhatt, Southeastern Louisiana University*
20. **Raster Solvent Vapor Annealing of Semi-Crystalline Homopolymer Films**  
*Daniel Christiansen, Tulane University*
21. **A Bio-Based Pro-Antimicrobial Network via Degradable Acetal Linkages**  
*Michael Sandoz, The University of Southern Mississippi*
22. **Wrinkling of Styrene-Maleic Anhydride Copolymer Brush Surfaces via Postpolymerization Modification**  
*Brittany Thompson, The University of Southern Mississippi*

**Graduate Students/Post-Docs Session 2 (1:00pm-2:00pm)**

23. **Poly(vinylmethylsiloxane)-b-Poly(methyl methacrylate) Characterization and Its Morphology Under Thin Film Confinement**  
*Saeed Behzadinasab, Tulane University*
24. **Low Temperature Frontal Polymerization of Acrylate-Based Composites for Use in Bone Repair**  
*Sam Bynum, Louisiana State University*

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25. **Comparative Study of Dielectric Relaxations Correlated to Hydrogen Bonding Organization between bis-MPA based Hyperbranched Polymer and Dendrimer**  
*Beibei Chen, The University of Southern Mississippi*
26. **Characterization of Neutral Multicomponent Transport through Cationic Nafion 117 Membranes Utilizing in situ ATR FTIR Spectroscopy**  
*Breanna Dobyms, Auburn University*
27. **Synthesis of Tailored Amphiphilic Block Copolymers with Tunable Self-Assembled Void Volume**  
*Chris Keller, Tulane University*
28. **High-Throughput Assessment of a Novel, Thiol-Acrylate Hydrogel for Tumor Spheroid Synthesis in a Microfluidic Device**  
*Nathan Kersker, Louisiana State University*
29. **Assembled Stimuli Response Nanoparticles: Dendrimer-pAMP Conjugates for Potential Controlled Drug Delivery Systems**  
*Dr. Janet Manono, Xavier University of Louisiana*
30. **Time-Lapse Materials: Using the Enzymatic Hydrolysis of Urea in Polymerization**  
*Dennel McKenzie, Louisiana State University*
31. **Formation and Utilization of Aqueous Gel Networks**  
*Graham Parkinson, Georgia Institute of Technology*
32. **Synthesis of bis-MPA Branched Polymers to Study Structural Properties**  
*McKenna Redding, Tulane University*
33. **Computational Modeling of Polymer Nanocomposites**  
*Michael Roth, The University of Southern Mississippi*
34. **Photoinitiated Crosslinking of Poly(vinylmethyl siloxane)**  
*Debaroty Roy, Tulane University*
35. **Synthesis of Novel and Sustainable (Bio-Based) Poly(Ether Amides)**  
*Guery Saenz, Mississippi State University*
36. **Utilization of Thiol-ene Chemistry for Simple Fabrication of Zeolite-Based Mixed Matrix Membranes**  
*Jacob Schekman, The University of Southern Mississippi*
37. **Effect of Ionic Group Location in Self-Assemblies of Sequence-Defined Peptoid Block Copolymers**  
*Garrett Sternhagen, Louisiana State University*
38. **Investigation of Fire Properties of UV Curable Thiol-ene Networks: Effect of Structure and Junction Points on Pyrolysis Behavior**  
*Vivek Vasagar, The University of Southern Mississippi*

**39. Isoporous Membranes via Block Copolymer Self Assembly**

*Daniel Weller, The University of Southern Mississippi*

**40. Effects of Branch Density on Linear-Dendritic Block Copolymers (LDBC)**

*Jon Williams, University of Mississippi*

**41. Mechanical Testing for Stretchable Organic Thin Film for Electronic Applications**

*Song Zhang, The University of Southern Mississippi*

**Undergraduate Students Session 2 (1:00pm-2:00pm)**

**42. Nano-Dispersed Pt(0) in Organically Modified Silicates as Efficient Catalysts for the Hydrosilylation of Olefins: The Effect of the Core Matrix**

*Shreeja Bhatt, Southeastern Louisiana University*

**43. Recyclable Sulfonamide “Polysoaps” for Removal of Hydrocarbon Impurities from Water for Remediation Applications**

*Mason Dearborn, The University of Southern Mississippi*

**44. Wrinkling of Styrene-Maleic Anhydride Copolymer Brush Surfaces via Postpolymerization Modification**

*Phillip Logan, The University of Southern Mississippi*

**45. Pro-Antimicrobial Networks with Degradable Acetals (PANDAs) Prepared via Thiol-ene Photopolymerization**

*Sarah Swilley, The University of Southern Mississippi*

**46. The Effect of Conductive Material to Modulate Front Velocities in Self-Propagating Thermal Frontal Polymerization Systems**

*Corey Weber, Louisiana State University*

**Notes**

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## **Keynote Speaker Bio**



**Timothy J. White** is the Technology Advisor of the Photonic Materials Branch in the Materials and Manufacturing Directorate of the Air Force Research Laboratory (AFRL). Tim received his Ph.D. in Chemical and Biochemical Engineering in 2006 from the University of Iowa. Subsequently he joined the Air Force Research Laboratory. Tim is active in all phases of research and development as leader of the “Responsive Photonic Materials” (RPM) group. The RPM group is an interdisciplinary team working basic, applied, and developmental research projects. Dr. White has been honored with the 2016 Materials Research Society “Outstanding Young Investigator” award, the 2013 SPIE Early Career Achievement award, the 2013 American Chemical Society PMSE Division Award for “Cooperative Research in Applied Polymer Science”, and the 2012 Air Force Early Career Award. His research is generally focused on stimuli-responsive materials, with an emphasis on polymers and liquid crystals. Dr. White actively serves the broader materials research community in leadership activities with American Chemical Society (POLY), Materials Research Society, and SPIE.

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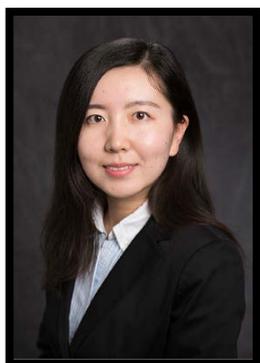
## **Career Panel Member Bios**



**Rebecca Parkhurst, US Government Accountability Office**  
Rebecca Parkhurst is a chemist and Senior Physical Scientist in the Center for Science, Technology, and Engineering at the U.S. Government Accountability Office. Prior to joining GAO in 2016, Rebecca was a AAAS Science and Technology Policy fellow in the Basic Research Office at the U.S. Department of Defense. Between these two positions Rebecca has worked on a variety of science policy issues including research funding, STEM education, and chemical safety and sustainability. Rebecca holds a PhD in organic chemistry from the Massachusetts Institute of Technology, and did post-doctoral research in polymer chemistry at the Adolphe Merkle Institute in Fribourg, Switzerland.

### **Monica Tisack, Mississippi Polymer Institute**

Monica Tisack is the director of the Mississippi Polymer Institute (MPI), working at the intersection of academia, entrepreneurship, and commercial industry. The non-profit Institute catalyzes and supports the growth of advanced materials at all stages of business maturity, and assists in educational outreach. Prior to joining MPI at the University of Southern Mississippi, she spent 20 years in the polymer industry working with nylon, Nafion™, ETFE, PTFE, Teflon™, and Tedlar™ polymer products with DuPont and its subsequent spin-off, The Chemours Company. Before graduate school, she interned as a technician at Eastman Chemical Company in their polyester division.



### **Lu Lu, Louisiana Multi-Functional Materials Group**

Lu Lu received her Ph.D in Chemistry Department at Louisiana State University in 2015. Right after, she joined Prof. Guoqiang Li's group at Department of Mechanical and Industrial Engineering as a postdoc. After the training in shape memory and self-healing polymers for over a year, she and her co-workers started a small business named as Louisiana Multi-Functional-Materials Group, LLC (LAMG). She is the Chief Chemist and leads the research of a project under NSF SBIR program.

**Timothy J. White, Air Force Research Laboratory**  
See Keynote Speaker Bio for More Information



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