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**CURRENT POSITION**

**Associate Professor**, University of Kentucky. Department of Biosystems and Agricultural Engineering, Lexington, KY: July 2021 to present.

Current Distribution of Effort: 55% Research, 40% Instruction, 5% Service.

**EDUCATION**

Ph.D., Biological Engineering (minor in Biotechnology), North Carolina State University, 2007

M.S., Food Science and Engineering, China Agricultural University, China, 2003

B.E., Material Science and Metallurgical Engineering, Chongqing University, China, 1999

**PROFESSIONAL EXPERIENCE**

**Associate Professor**, *University of Kentucky*. Biosystems and Agricultural Engineering Department, Joint Appointment in Chemical Engineering Department, Lexington, KY: July 2021 to present

**Affiliate/Visiting Scientist**, *Lawrence Berkeley National Laboratory*. Joint BioEnergy Institute, Berkeley, CA: June 2022 to present

**Assistant Professor**, *University of Kentucky*. Biosystems and Agricultural Engineering Department, Lexington, KY: July 2015 to June 2021

- Develop research program to understand and design new processes and models for bio-derived chemicals, materials and products
- Develop and teach upper level undergraduate and/or graduate level course(s) related to biofuels, bioenergy and industrial biotechnology

**Senior Scientist**, *Novozymes Biologicals Inc.* Salem, VA: January 2015 to June 2015

- Fermentation process development and optimization for BioAg products in biocontrol, yield enhancer, and biofertilizer
- Product recovery, separation, formulation, and technology transfer
- Integration of advanced analytics (metabolite profiling) to understand fermentation processes

**Postdoctoral Researcher**, Sandia National Laboratories/Joint BioEnergy Institute, Emeryville, CA: March 2012-January 2015

- Ionic liquid (IL) based fractionation and catalysis for biofuels production and catalytic lignin conversion
- Bioproducts (enzyme protein, solvent and biofuel) separation and recovery using centrifugation, ultra-, nano-filtration, osmosis, pervaporation, liquid-liquid extraction and electro-dialysis techniques
- Development of novel task specific renewable ILs for biomass pretreatment and other applications
- Proposal development to Advanced Biofuels PDU user facility for scale-up of enzyme production in 300L reactors and separation processes using Karr column and tangential flow filtration (TFF)

**Research Associate II**, Ohio Agricultural Research and Development Center, The Ohio State University, Wooster, OH: March 2011 to March 2012

- Development of an integrated anaerobic digestion (iAD) system that produces biogas from municipal, food and agricultural wastes and technology transfer/pilot scale demonstration with Quasar Energy Group
- Microbial community analysis on system failure during thermo- and mesophilic solid-state anaerobic digestion using 16S rRNA finger-printing and meta-genomic tools

**Postdoctoral Researcher**, University of California Riverside, Dept. of Chemical and Environmental Engineering, Riverside, CA: February 2008 to December 2010

- Comparison of leading biomass pretreatment technologies (dilute acid, hot water, soaking in aqueous ammonia, AFEX, SO<sub>2</sub>, lime, and microwave) by investigating enzyme adsorption isotherms and synergism on pure cellulose and pretreated biomass
- Simultaneous saccharification and fermentation (SSF) and multistage continuous SSF (cSSF) of dilute acid and hot-water pretreated corn stover using *E. coli KO11*, *Z. mobilis* and *S. cerevisiae*
- Technical and economic evaluation on the potential use of green and blue bin municipal solid waste (MSW) for biofuel production
- Participation in a multi-institutional project on aqueous catalytic conversion of cellulosic biomass to JP-8 range alkanes as gasoline and jet fuels

**Postdoctoral Researcher**, North Carolina State University, Department of Forest Biomaterials, Raleigh, NC: Aug 2007 to Feb 2008

- Develop an autohydrolysis process for improving biomass conversion.

**Bioinformatics Intern**, Johnson & Johnson, BIO R&D, Philadelphia, PA: 2007

- Design of a high-throughput sequence analysis tool for phage informatics/antibody discovery.

**Graduate Assistant**, North Carolina State University, Department of Biological and Agricultural Engineering, Raleigh, NC: January 2004 to May 2007

- Physiochemical and microbial delignification of agricultural waste by submerged/solid state fermentation using *P. chrysosporium*
- Statistical and kinetic modeling of heterogeneous microbial processes
- Value-added products from sweet potato; Bioethanol separation by selective membranes

## RECENT GRANTS

### **Nationally Competitive (\$9,634,233 total; \$5,279,975 as PI, cost share excluded)**

- 1) Sunkyu Park, Richard Venditti, Elis-Signe Olsson, Hasan Jameel, Margaret Blanchard, Xiaowen Chen, Yian Chen, Xiao Zhang, **Jian Shi**, Isabel Escobar, Qi Wang, Sefik Yunc, 2023. Deep Eutectic Solvent Pulping Technology to Reduce Carbon Emission in Pulp and Paper Industry, Department of Energy, **\$3,350,000** (\$2,600,000 federal share), 10/01/2023-09/30/2026. Shi: Co-Project Director.
- 2) C Saffron, W Lin, J Shi, E Monono, 2023. Travel: Symposium on Science and Technology Driving the Bioeconomy 2023, National Science Foundation, **\$18,000**, 06/01/2023-01/31/2024. Shi: Co-Principal Investigator.
- 3) **J Shi**, Michael Montross, Dimitrios Koumoulis, Jin Chen, Fazleena Badurdeen, Mark Mba-Wright, Beiwen Li, Ling Ding, Mikael Karlsson, Jeff Manternach, Nathan Rich, 2022. Surface Enhanced Preprocessing of MSW for Year-Round Supply of Conversion-Ready Feedstocks, Department of Energy, **\$2,647,542** (\$2,116,749 federal share), 10/01/2022-09/31/2026. Shi: Project Director.
- 4) **J Shi**, Ryan Kalinoski, Patrick Heist. 2021. I-Corps: Lignin-derived antimicrobials to control bacterial contamination in fuel ethanol fermentation, National Science Foundation. **\$50,000**, 2/1/2021-4/30/2023. Shi: Principal Investigator (project completed).
- 5) Kunlei Liu, Landon Caudill, Heather Nikolic, **J Shi**, 2021. Development and Characterization of Densified Biomass-plastic Blend for Entrained Flow Gasification, Department of Energy, **\$500,000**, 8/01/2021-07/31/2023. Shi: Co-Investigator (project completed).
- 6) **J Shi**, M Crocker, M Gnanamani, M Dinh, Y Zheng, C Li, A Ray, H Hu. 2019. Sulfur Profiling in Pine Residues and Its Impact on Thermochemical Conversion, Department of Energy, **\$2,056,372** (\$1,641,922 federal share), 10/01/2019-07/31/2025. Shi: Project Director.
- 7) **J Shi**. 2019. RII Track-4: Elucidating Enzyme-Ionic Liquid Interactions to Enable Effective Lignin Valorization, National Science Foundation EPSCoR Research Fellow. **\$207,562**, 12/1/2019-5/31/2024. Shi: Principal Investigator.
- 8) **J Shi**, YT Cheng, S DeBolt. 2018. Lignin-silicon Electrode Material from High-lignin Content Endocarp Biomass, USDA-NIFA Sustainability Challenge Area. **\$500,000**, 5/1/2018-4/30/2023. Shi: Principal Investigator (project completed).
- 9) SE Nokes, B Lynn, B Knutson, S Rankin, **J Shi**. 2016. Assembling Successful Structures: Lignin Beads for Sustainability of Food, Energy, and Water Systems, National Science Foundation EPSCoR RII Track-2 FEC, **\$2,000,000**, 8/1/2016 – 7/31/2021. Shi: Co- Principal Investigator (project completed).

### **Regionally Competitive (\$72,500 total; \$72,500 as PI, cost share excluded)**

- 1) **J Shi** and H Zhu, 2017. A sweet BioAg solution: Sweet sorghum bagasse based crop yield enhancer, Kentucky Science and Engineering Foundation (KSEF), **\$50,000**, 8/1/2017-7/31/2018. Shi: Principal Investigator (completed).
- 2) **J Shi**. 2018. Production of lipo-chitooligosaccharides from *Bradyrhizobium japoricum* grown on food waste, KY NSF EPSCoR-Research Scholars Program, **\$7500**, 7/1/2018-6/30/2019. Shi: Principal Investigator (completed).

- 3) **J Shi**. 2017. High-value carotenoids from biorefinery waste streams, KY NSF EPSCoR-Research Scholars Program, **\$7500**, 7/1/2017-6/30/2018. Shi: Principal Investigator (completed).
- 4) **J Shi**. 2016. Production of biocontrol agents for Asian rust disease using soybean processing byproducts, KY NSF EPSCoR-Research Scholars Program, **\$7500**, 7/1/2016-6/30/2017. Shi: Principal Investigator (completed).

***UK Internally Competitive (\$474,518 total; \$106,221 as PI, cost share excluded)***

- 1) DY Kim, YT Cheng, X Gao, AO Omosebi, E Santillan-Jimenez, S Rankin, B Knutson, DS, yang, F Yang, A Seo, D Bhattacharyya, **J Shi**, 2023. HPR-40 differential electrochemical mass spectrometry (DEMS), UKY Office of the Vice President for Research, **\$84,055**
- 2) AF Miller, et al., 2023. Helium Recapture and Compression to Maximize NMR Accessibility and Resilience, UKY Office of the Vice President for Research, **\$91,855**
- 3) A Adedeji, **J Shi**, W Ford, T Barzee, T Messer, 2023. Replacement of A Dedicated Shared Equipment – Fourier Transform Infrared Spectrometer (FTIR), UKY Office of the Vice President for Research, **\$40,756** (including \$5,000 departmental cost share)
- 4) **J Shi**, A Adedeji, W Ford, T Barzee, T Messer, 2022. Particle Size Analyzer to Enable New Research Capacities for Multistate S1041 & NC1023, CAFE Research Office, **\$64,646**
- 5) Q Shao, **J Shi**, J Chen, 2021. Simulation-Deep Learning-Experiment Pipeline for Discovery of Novel Deep Eutectic Solvents, Igniting Research Collaborations (IRC) pilot grant, **\$35,000**, 1/1/2021-12/31/2021. Shi: Co-Principal Investigator.
- 6) T Dvorak, **J Shi**, SE Nokes, 2019. Providing STEM education with a sustainable outlook to youth, Kentucky NSF EPSCoR, **\$1,600**, 11/1/2019-10/31/2020. Shi: Co-Investigator.
- 7) A Adedeji, **J Shi**, M Davisson, 2019. Optimizing barley malt diastatic (fermentation) power and bioactive compounds for food (bourbon) production using LED lights, Food Connection Grant, **\$2,500**, 7/1/2019-6/30/2020. Shi: Co-Principal Investigator.
- 8) J Mobley, M Crocker, B Lynn, M Meier, R Schendel, S Debolt, SE Nokes, **J Shi**, M Weisenberger, 2019. Kentucky Integrated Biorefinery, UKY Sustainability Challenge Grant, **\$34,887**, 1/1/2019-12/31/2019. Shi: Co-Principal Investigator.
- 9) **J Shi** and A Adedeji, 2018. Multi-shot micro-pyrolyzer to enable new research capacities, Multistate Research Support Competition, CAFE Research Office, **\$37,575** (\$10000 awarded from CAFE and \$5000 match from BAE department)
- 10) A Adedeji and **J Shi**, 2018. Acquisition of a digital PCR for food-feed-fiber-energy-water related research, teaching and extension, Multistate Research Support Competition, CAFE Research Office, **\$87,644** (\$77,644 awarded from CAFE)
- 11) **J Shi**. 2016. Design and implementation of new biofuels and bioprocessing courses through eLearning innovation initiative (eLII), UKY eLII Teaching Enhancement Award, **\$4000**, 6/1/2016-5/31/2017 (Competitive Funds for Teaching Support)

***Non-Competitive (excluding startup fund)***

- 1) CAFE 2022-2023 Research Activity Award, **\$2994** (50% match from BAE department)

- 2) Powering the Kentucky Bioeconomy for a Sustainable Future, NSF EPSCoR RII Track-1 FEC, PI on a scope account (Overall PI: R. Andrews), **\$326,000** as part of the startup fund, 8/1/2015-7/30/2019
- 3) Additional support to cover tuition and stipend for graduate students from KY NSF EPSCoR “Powering the Kentucky Bioeconomy for a Sustainable Future”, PI on a subcontract of **\$81,070**, 8/1/2015-7/30/2019
- 4) CAFE 2018-2019 Research Activity Award, **\$2610** (50% match from BAE department)

### ***Multistate and Hatch Projects***

- 1) S1075: “The science and engineering for a biobased industry”, 2023-2028. Shi: Principal-Investigator and committee chair of the proposal development team.
- 2) S1075: “The science and engineering for a biobased industry”, 2019-2023. Shi: Principal-Investigator and member of the proposal development team.
- 3) S1084: Industrial Hemp Production, Processing, and Marketing in the U.S. 2018-2022. Shi: Participant, member of the proposal development team.
- 4) S1041: “The science and engineering for a biobased industry”, 2014-2018. Shi: Principal-Investigator from 2016-2018 (completed).

### **PUBLICATIONS<sup>1</sup>**

(\*Corresponding author, \*Supervised student/post-doc; #Previous work published while at UK; JIF: journal impact factor of the publication year, TC: total citations based on google scholar until Oct/31/2023)

#### **<sup>1</sup>Peer-reviewed journal publications and book chapters**

##### ***2015-present***

- 1) J Hunter<sup>\*</sup>, Q Qi, Y Zhang<sup>\*</sup>, Q Shao, C Crofcheck, **J Shi\*** (2023) Green solvent mediated extraction of micro- and nano-plastic particles from water. *Scientific Report*, 13, 10585
- 2) X Bai, J Tang, W Wang, J Ma, **J Shi**, W Ren (2023) Organic Amendment Effects on Cropland Soil Organic Carbon and its Implications: A Global Synthesis, *CATENA*, 231, 107343
- 3) C Liu<sup>\*</sup>, A Ullah<sup>\*</sup>, X Gao, **J Shi\*** (2023) Synergistic Ball Milling–Enzymatic Pretreatment of Brewer’s Spent Grains to Improve Volatile Fatty Acid Production through Thermophilic Anaerobic Fermentation, *Processes*, 11(6), 1648 (Feature Article)
- 4) M Liu, J Hunter, **J Shi**, Y Zheng (2023) Bioleaching to produce clean loblolly pine for thermochemical conversion, *Fuel*, 344, 128148
- 5) U Abbas, Y Zhang, J Tapia, S Md, J Chen, **J Shi**, Q Shao (2023) Deciphering Hydrogen Bond Features to Develop Machine Learning Models for Predicting Non-ionic Deep Eutectic Solvents, *ChemRxiv*
- 6) Y Zhang<sup>\*</sup>, Q Qiao, UL Abbas, J Liu, Y Zheng, C Jones, Q Shao, **J Shi\*** (2023) Lignin derived hydrophobic deep eutectic solvents as sustainable extractants, *Journal of Cleaner Production*, 388, 135808
- 7) W Li<sup>\*</sup>, **J Shi** (2023) Lignin-derived carbon material for electrochemical energy storage applications: insight into the process-structure-properties-performance correlations, *Frontiers in Bioengineering and Biotechnology*, 11:1121027

- 8) A Ullah<sup>\*</sup>, Y Zhang, C Liu, Q Qiao, Q Shao, **J Shi<sup>\*</sup>** (2022) Process intensification strategies for green solvent mediated biomass pretreatment, *Bioresource Technology*, 128394
- 9) MC Vin-Nnajofofor<sup>\*</sup>, W Li, S Debolt, YT Cheng, **J Shi<sup>\*</sup>** (2022) Fractionation and Upgrade of Endocarp Lignin to Carbon-Silicon Nanocomposites as an Anode Material in Lithium-Ion Batteries, *Applied Engineering in Agriculture*, 38(3): 509-516
- 10) JC Stevens<sup>\*</sup>, **J Shi<sup>\*</sup>** (2022) Modifying surface charges of a thermophilic laccase toward improving activity and stability in ionic liquid, *Frontiers in Bioengineering and Biotechnology*, 10: 816
- 11) W Li<sup>\*</sup>, D Qian, DY Kim, YT Cheng, **J Shi<sup>\*</sup>** (2022) Engineering Lignin-Derived Carbon–Silicon Nanocomposite Electrodes: Insight into the Copyrolysis Mechanism and Process–Structure–Property–Performance Relationships, *ACS Sustainable Chemistry & Engineering*, 10, 2, 868-879
- 12) MC Vin-Nnajofofor<sup>\*</sup>, W Li, S Debolt, YT Cheng, **J Shi** (2022) Characterization of the Composition, Structure, and Mechanical Properties of Endocarp Biomass, *Journal of the ASABE*, 65(1): 67-74
- 13) UL Abbas, Q Qiao, MT Nguyen, **J Shi**, Q Shao (2022) Molecular Dynamics Simulations of Heterogeneous Hydrogen Bond Environment in Hydrophobic Deep Eutectic Solvents, *AIChE Journal*, e17382
- 14) RM Kalinoski<sup>\*</sup>, W Li, JK Mobley, X Chen, SE Nokes, BC Lynn, **J Shi<sup>\*</sup>** (2021). Controlling bacterial contamination during fuel ethanol fermentation using thermochemically depolymerized lignin bio-oils, *Green Chemistry*, 23 (17), 6477-6489
- 15) UL Abbas, Q Qiao, MT Nguyen, **J Shi**, Q Shao (2021). Structure and Hydrogen Bonds of Hydrophobic Deep Eutectic Solvent-Aqueous Liquid-Liquid Interfaces, *AIChE Journal*, e17427
- 16) Q Qiao, **J Shi**, Q Shao (2021). Multiscale Solvation Effect on Reactivity of  $\beta$ -O-4 of Lignin Dimers in Deep Eutectic Solvents, *Physical Chemistry Chemical Physics*, 23 (45), 25699-25705
- 17) Q Qiao, **J Shi**, Q Shao (2021). Effects of water on the solvation and structure of lipase in deep eutectic solvents containing a protein destabilizer and stabilizer, *Physical Chemistry Chemical Physics* 23 (40), 23372-23379
- 18) W Li<sup>\*</sup>, Y Zhang, **J Shi<sup>\*</sup>** (2021). Product and Solvent Recovery in Ionic Liquid-Based Biomass Pretreatment Processes, Book Chapter in *Encyclopedia of Ionic Liquids*, Springer
- 19) B Ai<sup>\*</sup>, L Zheng, W Li<sup>\*</sup>, X Zheng, Y Yang, D Xiao, J Shi, Z Sheng (2021) Biodegradable cellulose film prepared from banana pseudo-stem using an ionic liquid for mango preservation, *Frontiers in Plant Science*, 12, 234
- 20) E Liu, W Li, S DeBolt, SE Nokes, **J Shi<sup>\*</sup>** (2021). Fractionation, Characterization, and Valorization of Lignin Derived from Engineered Plants, Book Chapter in *Emerging Technologies for Biorefineries, Biofuels, and Value-Added Commodities*, pp245-288, Springer
- 21) RM Kalinoski<sup>\*</sup>, W Li<sup>\*</sup>, JK Mobley, SO Asare, M Dorrani, BC Lynn, X Chen, **J Shi<sup>\*</sup>** (2020). Antimicrobial properties of corn stover lignin fractions derived from catalytic transfer hydrogenolysis in supercritical ethanol with a Ru/C catalyst, *ACS Sustainable Chemistry & Engineering*, 8, 50, 18455–18467
- 22) W Li<sup>\*</sup>, N Wanninayake, X Gao, M Li, Y Pu, DY Kim, AJ Ragauskas, **J Shi<sup>\*</sup>** (2020). Mechanistic insight into lignin slow pyrolysis by linking pyrolysis chemistry and carbon material properties, *ACS Sustainable Chemistry & Engineering*, 8, 42, 15843–15854
- 23) B Ai<sup>\*</sup>, J Woomer, M Li, W Li<sup>\*</sup>, Y Pu, Z Sheng, L Zheng, A Adedeji, AJ Ragauskas, **J Shi<sup>\*</sup>** (2020). Natural deep eutectic solvents mediated extrusion for continuous high-solid pretreatment of lignocellulosic biomass, *Green Chemistry*, 22, 6372-6383 (Back Cover)
- 24) M Barekati-Goudarzi, D Boldor, L Khachatryan, B Lynn, R Kalinoski<sup>\*</sup>, J Shi (2020). Heterogeneous and homogeneous components in gas-phase pyrolysis of hydrolytic lignin, *ACS Sustainable Chemistry & Engineering*, 8, 34, 12891–12901

- 25) GY Lee<sup>\*</sup>, W Li<sup>\*</sup>, UM Chirwa, **J Shi\*** (2020) Effect of substrate characteristics on the growth and sporulation of two biocontrol microorganisms during solid state cultivation. *Fermentation*, 6, 69
- 26) JC Stevens<sup>\*</sup>, DW Rodgers, C Dumon, **J Shi\*** (2020) Characterization and enzyme engineering of a hyperthermophilic laccase toward improving its activity in ionic liquid, *Frontier in Energy Research*, 8, 158.
- 27) L Das<sup>\*</sup>, W Li, LA Dodge, JC Stevens, DW Williams, H Hong, C Li, AE Ray, **J Shi\*** (2020) Comparative evaluation of industrial hemp cultivars: agronomical practices, feedstock characterization and potential for biofuels and bioproducts, *ACS Sustainable Chemistry & Engineering*, DOI: 10.1021/acssuschemeng.9b06145.
- 28) JC Stevens<sup>\*</sup>, L Das, JK Mobley, AO Shadrack, BC Lynn, DW Rodgers, **J Shi\*** (2019). Understanding laccase-ionic liquid interactions toward biocatalytic lignin conversion in aqueous ionic liquids, *ACS Sustainable Chemistry & Engineering*, 7, 19, 15928-15938.
- 29) JC Stevens<sup>\*</sup>, **J Shi\*** (2019) Biocatalysis in ionic liquids for lignin valorization: Opportunities and recent developments, *Biotechnology Advances*, 107418.
- 30) JA Belgodere, SA Zamin, RM Kalinoski<sup>\*</sup>, CE Astete, JC Penrod, KM Hamel, BC Lynn, JS Rudra, **J Shi\***, JP Jung<sup>\*</sup> (2019) Modulating mechanical properties of collagen–lignin composites, *ACS Applied Bio Materials*, 2,8,3562-3572 ([Supplemental Cover](#)).
- 31) PD Muley, JK Mobley, X Tong, B Novak, J Stevens, D Moldovan, **J Shi**, D Boldor<sup>\*</sup> (2019) Rapid microwave-assisted biomass delignification and lignin depolymerization in deep eutectic solvents, *Energy Conversion and Management*, 196, 1080-1088.
- 32) L Dodge<sup>\*</sup>, RM Kalinoski, L Das, J Bursavich, PD Muley, D Boldor, **J Shi\*** (2019) Sequential extraction and characterization of lignin derived compounds from thermochemically processed biorefinery lignins, *Energy and Fuels*, 33 (5), 4322-4330.
- 33) RA Kalinoski<sup>\*</sup>, **J Shi\*** (2019). Hydrogels derived from lignocellulosic compounds: Evaluation of the compositional, structural, mechanical and antimicrobial properties, *Industrial Crops and Products*, 128: 323-330.
- 34) W Li<sup>\*</sup>, K Amos, M Li, Y Pu, S Debolt, AJ Ragauskas, **J Shi\*** (2018). Fractionation and characterization of lignin streams from unique high-lignin content endocarp feedstocks, *Biotechnology for Biofuels*, 11: 304.
- 35) W Li<sup>\*</sup>, Y Zhang, L Das, Y Wang, M Li, N Wanninayake, Y Pu, DY Kim, YT Cheng, AJ Ragauskas, **J Shi\*** (2018). Linking lignin source with structural and electrochemical properties of lignin-derived carbon materials, *RSC Advances*, 8: 38721-38732.
- 36) L Das<sup>\*</sup>, M Li, JC Stevens, W Li, Y Pu, AJ Ragauskas, **J Shi\*** (2018). Characterization and catalytic transfer hydrogenolysis of deep eutectic solvent extracted sorghum lignin to phenolic compounds, *ACS Sustainable Chemistry & Engineering*, 6 (8): 10408-10420.
- 37) E Liu<sup>\*</sup>, M Li, L Das, Y Pu, T Frazier, B Zhao, M Crocker, AJ Ragauskas, **J Shi\*** (2018). Understanding lignin fractionation and characterization from engineered switchgrass treated by an aqueous ionic liquid, *ACS Sustainable Chemistry & Engineering*, 6(5): 6612-6623.
- 38) E Liu<sup>\*</sup>, L Das, M Crocker, B Zhao, **J Shi\*** (2017). Impact of dilute sulfuric acid, ammonium hydroxide and ionic liquid pretreatment on the fractionation and characterization of engineered switchgrass, *BioEnergy Research*, 10: 1079-1093.

- 39) L Das\*, E Liu, A Saeed, DW Williams, H Hong, C Li, AE Ray, **J Shi\*** (2017). Industrial hemp as a potential biofuels crop in comparison with kenaf, switchgrass and biomass sorghum, *Bioresource Technology*, 244: 641-649.
- 40) L Das\*, S Xu, **J Shi\***. Catalytic oxidation and depolymerization of lignin in aqueous ionic liquid (2017). *Frontiers in Energy Research*, 5:21.
- 41) Y Zheng, **J Shi#**, M Tu, YS Cheng (2017) Principles and development of lignocellulosic biomass pretreatment for biofuels. Published by Elsevier, In *Advance in Bioenergy*, 2: 1-68.
- 42) J Sun, **J Shi#**, NVSN Murthy Konda, D Campos, D Liu, S Nemser, J Shamshina, T Dutta, P Berton, G Gurau, RD Rogers, BA Simmons and S Singh (2017). Efficient dehydration and recovery of ionic liquid after lignocellulosic processing using pervaporation. *Biotechnology for Biofuels* 10(1): 154.
- 43) **J Shi#**, D Wu, L Zhang, BA Simmons, S Singh, B Yang, CE Wyman (2017) Dynamic changes of substrate reactivity and enzyme adsorption on partially hydrolyzed cellulose. *Biotechnology and Bioengineering*, 114: 503–515.
- 44) H Wang\*, B Zhang, S Xiu, R Li, **J Shi\*** (2016) Densification and pyrolysis of lignocellulosic biomass for renewable energy. *Current Organic Chemistry*, 20: 2480 – 2488.
- 45) T Dutta, **J Shi#**, J Sun, X Zhang, G Cheng, BA Simmons, S Singh (2016) Ionic liquid pre-treatment of lignocellulosic biomass for biofuels and chemicals. In *Ionic Liquids in the Biorefinery Concept: Challenges and Perspectives*, Rafal Bogel-Lukasik Edition, Published by the Royal Society of Chemistry. (Peer Reviewed Book Chapter)
- 46) **J Shi#**, S Pattathil, R Parthasarathi, NA Anderson, JI Kim, S Venketachalam, MG Hahn, C Chapple, BA Simmons, S Singh (2016) Impact of engineered lignin composition on biomass recalcitrance and ionic liquid pretreatment efficiency. *Green Chemistry*, 18: 4884-4895. (Back Cover Article).
- 47) J Sun, S Konda, **J Shi#**, R Parthasarathi, T Dutta, F Xu, CD Scown, BA Simmons, S Singh (2016) CO<sub>2</sub> enabled process integration for the production of cellulosic ethanol using bionic liquids, *Energy and Environmental Science*, 9: 2822-2834. (Featured research in Berkeley Lab News, Science Daily, Biofuels Digest, R&D magazine, Biomass Magazine, etc.)
- 48) YF Li, **J Shi#**, MC Nelson, PH Chen, J Graf, Y Li, Z Yu (2016) Impact of different ratios of feedstock to liquid anaerobic digestion effluent on the performance and microbiome of solid-state anaerobic digesters digesting corn stover, *Bioresource Technology*, 200: 744–752.
- 49) F Xu, J Sun, S Konda, **J Shi#**, T Dutta, CD Scown, B Simmons, S Singh (2016) Transforming biomass conversion with ionic liquids: process intensification and the development of a high-gravity, one-pot process for the production of cellulosic ethanol. *Energy & Environmental Science*, 9, 1042-1049. (Featured research in Berkeley Lab News, Science Daily, Ethanol Producer Magazine, Nano Werk, etc.)
- 50) R Parthasarathi, K Balamurugan, **J Shi#**, V Subramanian, BA Simmons, S Singh (2015) Theoretical insights into the role of water in the dissolution of cellulose using IL/water mixed solvent systems. *The Journal of Physical Chemistry B*, 119, 14339–14349. (Front Cover Article)
- 51) **J Shi#**, George K, Sun N, He W, Stavila V, Lee TS, Simmons BA, Singh S (2015) Impact of pretreatment technologies on saccharification and isopentenol fermentation of mixed lignocellulosic feedstocks, *BioEnergy Research*, 1-10.
- 52) George A, Brandt A, Tran K, Zahari S, Klein-Marcuschamer D, Sun N, Sathitsuksanoh N, **Shi J#**, Stavila V, Parthasarathi R, Singh S, Holmes BM, Welton T, Simmons BA, Hallett JP (2015) Design of low-cost ionic liquids for lignocellulosic biomass pretreatment, *Green Chemistry*, 17, 1728-1734.



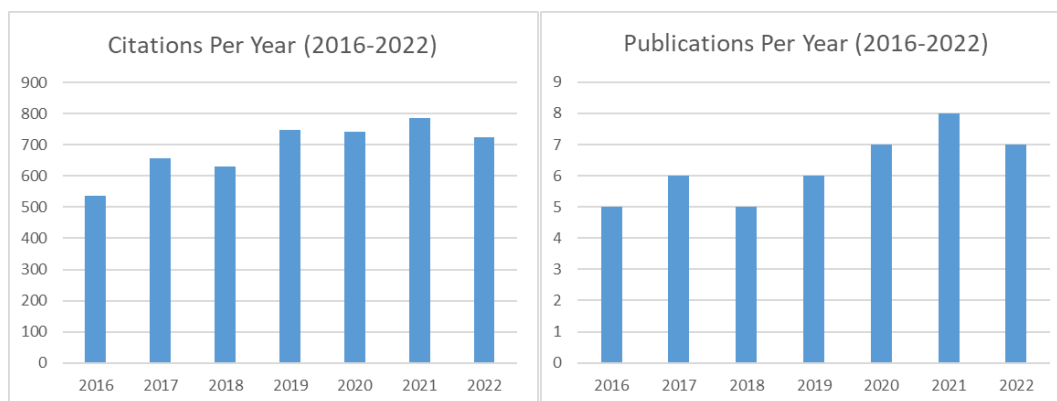
- 53) Sathitsuksanoh N, Sawant M, Truong Q, Tan J, Canlas CG, Sun N, Zhang W, Renneckar S, Prasomsri T, **Shi J**<sup>#</sup>, Çetinkol Ö, Singh S, Simmons BA, George A (2015) How alkyl chain length of alcohols affects lignin fractionation and ionic liquid recycle during lignocellulose pretreatment? *BioEnergy Research*, 8, 973-981.
- 54) **Shi J**, Balamurugan K, Parthasarathi R, Sathitsuksanoh N, Zhang S, Stavila V, Subramanian V, Simmons BA, Singh S (2014) Understanding the role of water during ionic liquid pretreatment of lignocellulose: co-solvent or anti-solvent, *Green Chemistry*, 16, 3830-3840.
- 55) Socha, AM, Parthasarathi R, **Shi J**, Pattathil S, Whyte D, Bergeron M, Venkatachalam S, Hahn MG, Simmons BA, and Singh S (2014) Efficient biomass pretreatment using ionic liquids derived from lignin and hemicellulose, *Proceedings of the National Academy of Sciences*, 111, E3587-E3595. (Featured research in Berkeley Lab News, Science Daily, Biofuels Digest, R&D magazine)
- 56) **Shi J**, Chinn, MS, Sharma RS (2014) Interactions between fungal growth, substrate utilization, and enzyme production during solid substrate cultivation of *Phanerochaete chrysosporium* on cotton stalks. *Bioprocess and Biosystems Engineering*, 37, 2463-2473.
- 57) Kai D, Takasuka TE, Heins R, Cheng X, Bergeman LF, **Shi J**, Aschenbrenner R, Deutsch S, Singh S, Sale KL, Simmons BA, Adams PD, Singh AK, Fox BG, and Northen TR, (2014) Rapid kinetic characterization of glycosyl hydrolases based on oxime derivatization and nanostructure-initiator mass spectrometry (NIMS), *ACS Chemical Biology*, 9, 1470–1479 (Cover article).
- 58) Sun N, Parthasarathia N, Socha AM, **Shi J**, Zhang J, Stavila V, Sale KL, Simmons BA, Singh S (2014) Understanding pretreatment efficacy of four cholinium and imidazolium ionic liquids by chemistry and computation, *Green Chemistry*, 16, 2546-2557.
- 59) **Shi J**, Xu F, Wang Z, Stiverson JA, Yu ZT, Li Y (2014). Effects of microbial and non-microbial factors of liquid anaerobic digestion effluent as inoculum for solid-state anaerobic digestion of corn stover, *Bioresource Technology*, 157:188–196.
- 60) Konda MNVSN, **Shi J**, Singh S, Blanch HW, Simmons BA, Klein-Marcuschamer D (2014) Understanding cost drivers and economic potential of two variants of ionic liquid pretreatment for cellulosic biofuel production, *Biotechnology for Biofuels*, 7:86.
- 61) **Shi J**, Gladden JM, Sathitsuksanoh N, Kambam P, Sandoval L, Mitra D, Zhang S, George A, Singer SW, Simmons BA, Singh S (2013). One-pot ionic liquid (IL) pretreatment and saccharification of switchgrass, *Green Chemistry*, 15, 2579-2589. (Featured research in Science Daily, R&D magazine; cover story on Biofuels Digest).
- 62) **Shi J**, Wang Z, Stiverson JA, Yu ZT, Li Y (2013). Reactor performance and microbial community dynamics during solid-state anaerobic digestion of corn stover at mesophilic and thermophilic conditions, *Bioresource Technology*, 136: 574–581.
- 63) **Shi J**, Thompson VS, Yancey NA, Stavila V, Simmons BA, Singh S (2013) Impact of mixed feedstocks and feedstock densification on ionic liquid pretreatment efficiency, *Biofuels*, 4(1): 63–72 (Highlighted research in Berkeley Lab News, Science Daily, and DOE Pulse).
- 64) Xu F, **Shi J**, Lv W, Yu Z and Li Y (2013) Comparison of different anaerobic digestion effluents as inocula and nitrogen sources for solid-state anaerobic digestion of corn stover, *Waste Management*, 33(1):26-32.
- 65) Brown D, **Shi J**, Li Y (2012) Comparison of solid-state to liquid anaerobic digestion of lignocellulosic feedstocks for biogas production, *Bioresource Technology*, 124: 379–386.

- 66) Liew LN, **Shi J**, Li Y (2012) Methane production from solid-state anaerobic digestion of lignocellulosic biomass, *Biomass & Bioenergy*, 46: 125–132.
- 67) Cui Z, Wan C, Shi J, Sykes RW, Li Y (2012) Enzymatic digestibility of corn stover fractions in response to fungal pretreatment, *Industrial & Engineering Chemistry Research*, 51 (21): 7153–7159 (Highlighted research in ACS News and Science Daily).
- 68) Cui Z<sup>1</sup>, **Shi J**<sup>1</sup>, Wan C and Li Y (2012) Comparison of alkaline- and fungi-assisted wet-storage of corn stover, *Bioresource Technology*, 109: 98-104 (<sup>1</sup>equal contribution).
- 69) **Shi J**, Sharma-Shivappa RS, and Chinn MS (2012) Interactions between fungal growth, substrate utilization and enzyme production during shallow stationary cultivation of *Phanerochaete chrysosporium* on cotton stalks, *Enzyme and Microbial Technology*, 51 (1): 1-8.
- 70) **Shi J**, Qing Q, Zhang T, Lloyd TA and Wyman CE (2012) Aqueous processing of cellulosic biomass for biological and chemical conversion to ethanol and other fuels. In *Fundamentals of Materials for Energy and Environmental Sustainability*, David Ginley and David Cahen edition, Materials Research Society and Cambridge University Press. (Book Chapter).
- 71) Tanjore D, **Shi J**, and Wyman CE (2011) Water-only and dilute acid pretreatment of lignocellulosic biomass. In *Chemical and Biochemical Catalysis for Next Generation Biofuels (RSC Energy Series)*, Blake A. Simmons edition, Royal Society of Chemistry, Cambridge, UK. (Book Chapter)
- 72) Cui Z, **Shi J**, and Li Y (2011) Solid-state anaerobic digestion of spent wheat straw from horse stall for biogas production, *Bioresource Technology*, 102 (20):9432-37.
- 73) Liew LN, **Shi J**, and Li Y (2011) Enhancing solid-state anaerobic digestion of fallen leaves through simultaneous alkaline treatment, *Bioresource Technology*, 102 (19):8828-8834.
- 74) **Shi J**, Pu Y, Yang B, Ragauskas A, and Wyman CE (2011) Comparison of microwaves to fluidized sand baths for heating tubular reactors for hydrothermal and dilute acid batch pretreatment of corn stover. *Bioresource Technology*, 102(10): 5952-61.
- 75) Falls M, **Shi J**, Ebrik MA, Redmond T, Yang B, Wyman CE, Garlock RJ, Balan V, Dale BE, Pallapolu VR, Lee YY, Kim Y, Mosier NS, Ladisch MR, Hames B, Thomas SR, Donohoe BS, Vinzant TB, Elander RT, Sierra R, Holtzapple MT (2011) Investigation of enzyme formulation on pretreated switchgrass. *Bioresource Technology*, 102(24): 11072-79.
- 76) **Shi J**, Ebrik MA, Yang B, Wyman CE (2011) Sugar yields from dilute sulfuric acid and sulfur dioxide pretreatments and subsequent enzymatic hydrolysis of switchgrass, *Bioresource Technology*, 102(20):8930-38.
- 77) Pallapolu VR, Lee YY, Garlock RJ, Balan V, Dale BE, Kim Y, Mosier NS, Ladisch MR, Falls M, Holtzapple MT, Sierra R, **Shi J**, Ebrik MA, Redmond T, Yang B, Wyman CE, Donohoe BS, Vinzant TB, Elander RT, Hames B, Thomas SR, Warner RE (2011). Effects of enzyme loading and  $\beta$ -glucosidase on enzymatic hydrolysis of switchgrass processed by leading pretreatment technologies. *Bioresource Technology*, 102(24): 11115-20.
- 78) **Shi J**, Ebrik MA, Redmond T, Yang B, Garlock RJ, Balan V, Dale BE, Pallapolu VR, Lee YY, Kim Y, Mosier NS, Ladisch MR, Holtzapple MT, Falls M, Sierra R, Donohoe BS, Vinzant TB, Elander RT, Hames B, Thomas SR, Warner RE, Wyman CE, et al. (2011) Application of cellulase and hemicellulase to pure xylan, pure cellulose, and switchgrass solids from leading pretreatments. *Bioresource Technology*, 102(24): 11080-88.

- 79) Garlock RJ, Balan V, Dale BE, Pallapolu VR, Lee YY, Kim Y, Mosier NS, Ladisch MR, Holtzapple MT, Falls M, Sierra R, **Shi J**, Ebrik MA, Redmond T, Yang B, Wyman CE, Donohoe BS, Vinzant TB, Elander RT, Hames B, Thomas SR, Warner RE (2011). Comparative material balances around leading pretreatment technologies for the conversion of switchgrass to soluble sugars. *Bioresource Technology*, 102(24): 11063-71.
- 80) Donohoe BS, Vinzant TB, Elander RT, Pallapolu VR, Lee YY, Garlock RJ, Balan V, Dale BE, Kim, Y, Moiser N, Ladisch MR, Falls M, Sierra R, Holtzapple MT, **Shi J**, Ebrik MA, Redmond T, Yang B, Wyman CE, Hames B, Thomas SR, Warner RE (2011). Native and pretreated switchgrass surface and ultrastructural imaging analysis of various leading pretreatment technologies. *Bioresource Technology*, 102(24): 11097-104.
- 81) Kim, Y, Moiser N, Ladisch MR, Pallapolu VR, Lee YY, Garlock RJ, Balan V, Dale BE, Donohoe BS, Vinzant TB, Elander RT, Falls M, Sierra R, Holtzapple MT, **Shi J**, Ebrik MA, Redmond T, Yang B, Wyman CE, Warner RE (2011) Comparative study on enzymatic digestibility of switchgrass varieties and harvests processed by leading pretreatment technologies. *Bioresource Technology*. 102(24): 11089-96 (Highlighted research in Science Daily).
- 82) Tao L, Aden A, Elander RT, Pallapolu VR, Lee YY, Garlock RJ, Balan V, Dale BE, Kim Y, Mosier NS, Ladisch MR, Falls M, Holtzapple MT, Sierra R, **Shi J**, Ebrik MA, Redmond T, Yang B, Wyman CE, Hames B, Thomas SR, Warner RE (2011). Process and techno-economic analysis of leading pretreatment technologies for lignocellulosic ethanol production using switchgrass. *Bioresource Technology*, 102(24): 11105-14.
- 83) Wyman CE, Balan V, Dale BE, Elander RT, Falls M, Holtzapple MT, Hames B, Ladisch MR, Lee YY, Mosier NS, Pallapolu VR, **Shi J**, Thomas SR, Warner RE (2011). Comparative data on effects of leading pretreatments and enzyme loadings and formulations on sugar yields from different switchgrass sources. *Bioresource Technology* 102(24): 11052-62.
- 84) Li N, Tompsett GA, Zhang T, **Shi J**, Wyman CE, and Huber GW (2011) Renewable gasoline from aqueous phase hydrodeoxygenation of aqueous sugar solutions prepared by hydrolysis of maple wood. *Green Chemistry*, 13, 91-101.
- 85) Lee JM, **Shi J**, Venditti RA, Jameel H (2009) Autohydrolysis pretreatment of coastal bermuda grass for increased enzyme hydrolysis. *Bioresource Technology*, 100 (24): 6434-6441. [JIF= 4.365; TC = 110]
- 86) **Shi J**, Sharma-Shivappa RR, Chinn MS (2009) Microbial pretreatment of cotton stalks by submerged cultivation of *Phanerochaete chrysosporium*. *Bioresource Technology*, 100 (19): 4388-4395.
- 87) **Shi J**, Sharma-Shivappa RR, Chinn MS, Howell N (2009) Effects of microbial pretreatment on enzymatic hydrolysis and fermentation of cotton stalks to ethanol production. *Biomass and Bioenergy*, 33 (1): 88-96 (One of the Top 25 most cited papers for 2009-2014 of the journal).
- 88) **Shi J**, Chinn MS, Sharma-Shivappa RR (2008) Microbial pretreatment of cotton stalks by solid-state cultivation of *Phanerochaete chrysosporium*. *Bioresource Technology*, 99(14): 6556-6564.
- 89) **Shi J**, Sharma-Shivappa RR, Howell N, Shivappa RB, and Dean RA (2007) Challenge in quantification of ligninolytic enzymes from *Phanerochaete chrysosporium* cultivation for pretreatment of cotton stalks. *Transaction of the ASABE*, 50 (6): 2347-2354 (ASABE paper award 2008).

## Publication Metrics

(Google Scholar citation >7000 times, H-index = 45)



\* Counted until Oct 31 of 2023 based on Google Scholar.

## INTELLECTUAL PROPERTIES

(\* Denoted to intellectual properties developed at UKY)

- 1) Method for recycling the critical metals from spent lithium-ion batteries\*. **U.S. Provisional Patent 63/405,803** (total 5 co-inventors)
- 2) Hydrophobic deep eutectic solvent based lignocellulosic biomass processing\*. **U.S. Provisional Patent 63/524,334** (total 2 co-inventors)
- 3) Method for synthesizing a hydrophobic deep eutectic solvent\*. **U.S. Utility Patent, US20220144669A1** (total 4 co-inventors)
- 4) Compositions and methods for extracting plastic contaminants from water\*, **U.S. Utility Patent, US20210403346A1** (total 5 co-inventors)
- 5) Compositions and methods for inhibiting growth of lactic acid producing bacteria\*, **U.S. Utility Patent, US20210301249A1** (total 2 co-inventors)
- 6) Synthesis and formulation of lignin derived compounds as treatment of plant diseases\*. **U.S. Utility Patent, US20210007352A1** (total 2 co-inventors)
- 7) Lignin valorization in ionic liquids and deep eutectic solvents via catalysis and biocatalysis\*. **U.S. Utility Patent, 10,723,859** (total 4 co-inventors)
- 8) Renewable aromatics from lignocellulosic lignin, **U.S. Utility Patent, 16/254,305** (total 5 co-inventors)
- 9) Adjusting the pH of a pretreatment solution using carbon dioxide useful for integrating saccharification and fermentation. **WO2016105538 A1** (total 4 co-inventors)
- 10) A bioreactor for ethanol production from lignocellulosic biomass by solid substrate fermentation, **China Patent, CN2535414Y** (total 3 co-inventors)
- 11) A method to produce ethanol from corn stover by solid substrate fermentation, **China Patent, CN 1216150C** (total 4 co-inventors)

## **TECHNICAL/EXTENSION REPORTS**

- 1) Shi J, Ebrik M, Yang B, Wyman CE (2009) The potential of cellulosic ethanol production from municipal solid waste: a technical and economic evaluation (*University of California Energy Institute. Development & Technology. Paper EDT-015, <http://repositories.cdlib.org/ucei/devtech/EDT-015>*)
- 2) Li Y, Shi J, Reeder R (2011) Storing lignocellulosic biomass as silage. The Ohio State University Extension-Agriculture and Natural Resources, Fact Sheet: AEX 651.1-11 (<http://ohioline.osu.edu/aex-fact/pdf/0651.pdf>)

## **AWARDS AND RECOGNITION**

- 1) Bobby Pass Grantsmanship Award (UKY CAFE), 2023
- 2) Wethington Award, University of Kentucky, 2017, 2018, 2019, 2020, 2021, 2022, 2023
- 3) Nominated by the department to compete College of Engineering Outstanding Teacher award, 2019
- 4) Early Career Award, Association of Overseas Chinese Agricultural, Biological, and Food Engineers (AOCABFE), 2018
- 5) Recognized for having the Most Patent Disclosures, Joint BioEnergy Institute, 2014
- 6) Recognized for Citizenship Contribution Award, Deconstruction Division, Joint BioEnergy Institute, 2014
- 7) First Place Research Poster Award, the Ohio Agricultural Research and Development Center (OARDC) Annual Research Conference, 2012
- 8) Supervised student team won the Honorable Mention Award, EPA P3 National Sustainable Design Expo, 2010
- 9) Honorable Mention Paper Award, American Society Agricultural Biological Engineers (ASABE), 2008
- 10) Graduate Student Paper Competition Award, Association of Overseas Chinese Agricultural, Biological and Food Engineers (AOCABFE), 2007
- 11) Gamma Sigma Delta, Inducted into the Honor Society for Agriculture, 2007
- 12) Sigma Xi, Inducted into the Scientific Research Society, 2006

## **TEACHING AND ADVISING**

### ***Courses Taught***

BAE 542: *Biofuels and Bioproducts* (3 credit hours) – *Newly Developed Course*

BAE 310: *Heat and Mass Transfer in Biosystems* (3 credit hours) – *Newly Developed Course*

BAE 775: *Professional Practice Seminar* (3 credit hours) – *Newly Developed Course*

### ***Guest Lectures***

- 1) BAE 549 Bioprocessing Fundamentals (2 lectures each year in 2016-2022)

- 2) GEN 300G Climate Change and Agriculture (1 lecture each year in 2017-2021)
- 3) ENG 199 Scholars Program in Undergraduate Research (1 lecture in 2018)

Course & Semester	No. Students	Course Evaluation <sup>1</sup>	Teaching Evaluation <sup>1</sup>
BAE 599, Spring 2018 <sup>1</sup>	27	4.6	4.5
BAE 310, Spring 2019 <sup>1</sup>	23	4.1	4.1
BAE 310, Spring 2020 <sup>1</sup>	19	4.5	4.7
BAE 310, Spring 2021 <sup>1</sup>	19	4.0	4.3
BAE 310, Spring 2022 <sup>1</sup>	22	4.1	4.5
BAE 310, Spring 2023 <sup>1</sup>	12	4.7	4.7
BAE 504, Fall 2015 <sup>1</sup>	8	3.2 <sup>3</sup>	3.2 <sup>3</sup>
BAE 504, Fall 2016 <sup>1</sup>	8	4.5	4.5
BAE 504, Fall 2017 <sup>1</sup>	6	4.3	4.3
BAE 542, Fall 2019 <sup>1</sup>	11	4.3	4.1
BAE 542, Fall 2021 <sup>1</sup>	7	4.7	4.9
BAE 542, Fall 2022 <sup>1</sup>	6	4.8	4.6
BAE 542, Fall 2023 <sup>1</sup>	8	4.6	4.6
BAE 775, Fall 2020 <sup>1</sup>	4	N/A <sup>4</sup>	N/A <sup>4</sup>
BAE 775, Fall 2021 <sup>1</sup>	10	4.6	4.4
BAE 775, Fall 2022 <sup>1</sup>	8	4.3	4.5
BAE450/750, Spring 2016	1	N/A <sup>4</sup>	N/A <sup>4</sup>
BAE450/750, Fall 2016	1	N/A <sup>4</sup>	N/A <sup>4</sup>
BAE450/750, Spring 2017	1	N/A <sup>4</sup>	N/A <sup>4</sup>
BAE450/750, Fall 2017	3	N/A <sup>4</sup>	N/A <sup>4</sup>
BAE450/750, Spring 2018	3	N/A <sup>4</sup>	N/A <sup>4</sup>
BAE450/750, Fall 2018	2	N/A <sup>4</sup>	N/A <sup>4</sup>
BAE450/750, Spring 2019	3	N/A <sup>4</sup>	N/A <sup>4</sup>
BAE450/750, Fall 2019	1	N/A <sup>4</sup>	N/A <sup>4</sup>
BAE450/750, Spring 2020	4	N/A <sup>4</sup>	N/A <sup>4</sup>

<sup>1</sup>BAE 310 was a newly designed course offered since 2018 (formalized from BAE 599: Special Topics as experimental teaching); <sup>2</sup>BAE 542 was redesigned from BAE 504 and offered since 2019, partially developed new content; <sup>3</sup>Scale was 4.0 in 2015 and comparison was made with College Agriculture. Scale of assessment was 5.0 since 2016. <sup>4</sup>Evaluation is not provided since the number of students is less than 5.

**Graduate student advising as advisory committee chair (6 PhD students, 7 MS students)**

*Masters - Completed*

- 1) Enshi Liu, M.S., Biosystems Engineering, graduated Spring 2017

(*Thesis*: Fractionation and characterization of lignin streams from engineered switchgrass, [https://uknowledge.uky.edu/bae\\_etds/49/](https://uknowledge.uky.edu/bae_etds/49/))

- 2) Luke Dodge, M.S., Biosystems Engineering, graduated Spring 2018

(*Thesis*: Fractionation of lignin derived compounds from thermochemical processed lignin towards antimicrobial properties, [https://uknowledge.uky.edu/bae\\_etds/54/](https://uknowledge.uky.edu/bae_etds/54/))

- 3) Makua Vin-Nnajofofor, M.S., Biosystems Engineering, graduated Spring 2021

(*Thesis*: Characterization and upgrade of endocarp biomass derived lignin to value added products, [https://uknowledge.uky.edu/bae\\_etds/79/](https://uknowledge.uky.edu/bae_etds/79/))

- 4) Jameson Hunter, M.S., Biosystems Engineering, graduated Fall 2021

(*Thesis*: Extraction of micro- and nano-plastic particles from water using hydrophobic natural deep eutectic solvents, [https://uknowledge.uky.edu/bae\\_etds/83/](https://uknowledge.uky.edu/bae_etds/83/))

- 5) Ashlee Edmonson, M.S., Biosystems Engineering, graduated May 2023

(*Thesis*: Life cycle assessment of air classification as a sulfur mitigation technology in pine residue feedstocks, [https://uknowledge.uky.edu/bae\\_etds/97/](https://uknowledge.uky.edu/bae_etds/97/))

#### *Ph.D. – Completed*

- 1) Wenqi Li, Ph.D., Biosystems Engineering, graduated Fall 2019

(*Dissertation*: Lignin-derived carbon and nanocomposite materials for energy storage applications, [https://uknowledge.uky.edu/bae\\_etds/68/](https://uknowledge.uky.edu/bae_etds/68/))

- 2) Joseph Stevens, Ph.D., Biosystems Engineering, graduated Fall 2020

(*Dissertation*: Characterization and enzyme engineering of laccases towards lignin valorization in aqueous ionic liquids, [https://uknowledge.uky.edu/bae\\_etds/72/](https://uknowledge.uky.edu/bae_etds/72/))

- 3) Ryan Kalinoski, Ph.D., Biosystems Engineering, graduated Fall 2020

(*Dissertation*: Characterizing and predicting the antimicrobial properties of lignin derivatives, [https://uknowledge.uky.edu/bae\\_etds/76/](https://uknowledge.uky.edu/bae_etds/76/))

- 4) Can Liu, Ph.D., Biosystems Engineering, in progress, graduated Summer 2023

(*Dissertation*: A process intensification approach to improve volatile fatty acids production, extraction, and valorization, [https://uknowledge.uky.edu/bae\\_etds/105/](https://uknowledge.uky.edu/bae_etds/105/))

- 5) Yuxuan Zhang, Ph.D., Biosystems Engineering, in progress, graduated Fall 2023

(*Dissertation*: Development of Lignin Derived Hydrophobic Deep Eutectic Solvents as Sustainable Solvents and Their Applications, [https://uknowledge.uky.edu/bae\\_etds/106/](https://uknowledge.uky.edu/bae_etds/106/))

#### *Masters – In Progress*

- 1) Emon Das, M.S. Biosystems Engineering, in progress, expected graduation Spring 2025

- 2) Enyonam Ahadzi, M.S. Biosystems Engineering, in progress, expected graduation Spring 2025

*Ph.D. – In Progress*

3) Gary Lopez, Ph.D. Biosystems Engineering, in progress, expected graduation Spring 2025

***Service on graduate advisory committee***

1. MS Thesis

- i. Kirtley Amos (BAE) - *Thesis: Up regulation of heat shock protein 70B (HSP70B) and SSA1 in Chlamydomonas Reinhardtii via HSP70A-RBCS2 and PSAD promoter, 2015*
- ii. Mathew Ruwaya (BAE) - *Thesis: Automated solid-substrate cultivation of the anaerobic bacterium Clostridium thermocellum, 2016*
- iii. Megan Walz (BAE) - *Thesis: Investigating the feasibility of using mesoporous silica particles to deliver glucose during anaerobic fermentation, 2018*
- iv. Julia Parker (BAE) – *Thesis: lignin valorization via reductive depolymerization using promoted nickel catalysts and sub- and supercritical methanol, 2022*
- v. Suvro Talukdar (BAE) – *Thesis: Microalgae Immobilization with Filamentous Fungi: Process Development for Sustainable Food Systems, 2023*

2. PhD Dissertation

*Internal*

- i. Jiazhi Hu (Chemical and Materials Engineering) graduated Fall 2019  
(*Dissertation: understanding the structure-property-performance relationship of silicon negative electrodes*)
- ii. Felix Akharume (Biosystems and Agricultural Engineering), expected Spring 2020
- iii. Rilwan Oyetunji (Biosystems and Agricultural Engineering), expected Fall 2020
- iv. Gedara Karunasinghe (Chemistry), expected Fall 2022
- v. Stephanie Sorensen (Chemistry), expected Fall 2022
- vi. Bayode Dada (Chemical and Materials Engineering), expected Fall 2023
- vii. Andrew Drake (Chemical and Materials Engineering), expected Fall 2022
- viii. Usman Abbas (Chemical and Materials Engineering), expected Fall 2023
- ix. Yosselin Islas Castro (Biosystems and Agricultural Engineering), expected Fall 2024

*External*

- x. Jorge Belgodere (Biomedical Engineering, LSU-AgCenter), expected Fall 2020

3. Outside Examiner

- i. Tao Chen (Chemical and Materials Engineering), 2016
- ii. Xueyi Sui (Plant and Soil Sciences), 2017
- iii. Soledad G. Yao (Chemistry), 2017
- iv. Yan Zhang (Chemistry), 2018



- v. Shuang Gao (Chemical and Materials Engineering), 2019
- vi. Yang Song (Chemical and Materials Engineering), 2019
- vii. Mahsa Moradipour (Chemical and Materials Engineering), 2021
- viii. Ming Wang (Chemical and Materials Engineering), 2021
- ix. Udari Kodithuwakku (Chemistry), 2023
- x. Poorya Kamali (Chemistry), 2023

***Advised/Advising post-doctoral scholars***

- i. Ahamed Ullah, 2022-present (*Project: DES and battery recycling*)
- ii. Wenqi Li, 2020-2022 (*Project: Sulfur profiling and lignin derived anode material*)
- iii. Lalitendu Das, 2016-2018 (*Project: Catalytic conversion of lignin*)

***Undergraduate/visiting student advising***

1. Current: Lillian Kirby, Abbey Osborne, Benjamin Shacklett

2. Past:

- i. Undergraduates: Abby Olaleye, Kennedy Krieg, Ashlee Edmonson, 2021
- ii. Visiting Students/Scholars: Dr. Binling Ai, 2020-21
- iii. Jeremy Kimbrough, Sophomore, Civil Engineering & Applied Mathematics, KYSU, 2019
- iv. Kristian Bolden and Jonathan Lott, high school seniors, from Carter G. Woodson Academy, 2019
- v. Jameson Hunter, Truc Nguyen, Biosystems Engineering, UKY, 2018-2019
- vi. Alejandro Espinosa, Sophomore, Civil Engineering & Applied Mathematics, KYSU, 2018
- vii. David Jenkins and Andrew Lin, Chemical Engineering Sophomores, 2018
- viii. Brad Ballard, Sophomore, Biosystems Engineering, UKY, 2016-2018
- ix. Ulalo Chirwa, Sophomore, Biosystems Engineering, UKY, 2016-2017
- x. Areej Saeed, Sophomore, Biosystems Engineering, UKY, 2016-2017
- xi. Ga-Young Lee, visiting undergraduate student, Indonesia International Institute for Life Sciences, 2016-2017
- xii. Xiao Chen, visiting MS student, Henan Agricultural University, China, 2016-2017
- xiii. Siquan Xu, visiting MS student, Nanjing Forestry University, China, 2016-2017

***Senior design teams:***

2023-24 (*Project: Design of system for microplastics recycle*)

2022-23 (*Project: Design of shredder and washer for municipal solid waste preparation*)

2017-18 (*Project: Design of an electrodialysis unit for ionic liquid recycle*)

***Other Teaching Outcomes/Student Awards***

- 1) Joe Stevens received a prestigious *Chateaubriand/MOPGA fellowship* (one of the 50 recipients nationwide). The fellowship will sponsor his 9-month research project at the Laboratoire d'Ingénierie des Systèmes Biologiques et des Procédés (LISBP), French National Institute for Applied Sciences (2019)
- 2) Ryan Kalinosi and Wenqi Li won 1st and 2nd place *Boyd-Scott Graduate Research Award* for PhD students, respectively. This award recognizes excellence in graduate student research from the American Society of Agricultural and Biological Engineers (ASABE) (2018)
- 3) Ulalo Chirwa, Enshi Liu, and Lalitendu Das won *Best Poster Awards* at the Super Collider conference organized by KY NSF EPSCoR (2017)
- 4) Supervised Areej Saeed on a project “Will hemp become the next big Kentucky crop?” that won the *2016 Oswald Research and Creativity Competition* for undergraduates, 2nd place under Physical and Engineering Sciences category (2016)
- 5) Supervised graduate student, Enshi Liu who received *2nd Place Poster Award* at 2016 Frontiers in Biorefining Conference, Simmons Island, GA (2016)
- 6) Developed two lecture modules for a web-based bioenergy education material exchange system (*BEEMS*), which are being adopted by eight Bio/Ag Engineering programs across the country (2011)
- 7) Supervised high school student, Rama Balasubramaniam on her research project “Which household waste produces the most biogas?”, which won the *Governor's Award for Excellence in Environmental Protection* and was nominated for *Broadcom Masters*, a nationwide competition for 6-8th graders (2011)
- 8) Supervised a senior design group, Garong J, Kwon C, Nguyen V, and Turgman A on their senior design project “Using alternative daily cover for producing cellulosic bioethanol” that won the *Honorable Mention Award* on the *EPA P3 National Sustainable Design Expo* (2010)
- 9) Served as a guest lecturer on the “Global climate change and energy systems workshops” for Riverside unified school district and provided mentorship for high school students on their science fair projects that won *2<sup>nd</sup> place award Riverside Unified School District Science & Engineering Fair* (2009)

**SERVICE**

***Departmental***

- 1) Undergraduate Curriculum Committee (UGCC), 2019-present
- 2) Secretary for faculty meeting, 2019-2021
- 3) Career advisor for BAE undergraduate students, 2018-present
- 4) Faculty advisor for Alpha Epsilon student branch, 2017-present

- 5) Faculty advisor for BAE Connection Newsletter, 2017-present
- 6) Committee of Research and Graduate Studies, 2015-present
- 7) Committee of Social Activities, 2015-2016
- 8) Committee of Building and Facilities, 2016-2018

### ***National/International Committees***

- 1) Secretary, Vice Chair, Chair, Multistate S1075: “The science and engineering for a biobased industry”, 2020-2023. Lead the proposal rewrite.
- 2) Secretary, Vice Chair, Chair, Process Systems Committee, American Society of Agricultural and Biological Engineers, 2018-2020
- 3) Committee member, ES220 and PRS-280, American Society of Agricultural and Biological Engineers, since 2016
- 4) Executive Board, Vice President, President-Elect, President, Association of Chinese Agricultural, Biological, and Food Engineers (AOC), 2016-2021
- 5) Session Chair, “Advances in lignin valorization”, American Society of Agricultural and Biological Engineers (ASABE), since 2018
- 6) Session Chair, “Feedstock pretreatment and fractionation: manipulating lignin and lignin products”, Symposium on Biotechnology for Fuels and Chemicals, Industrial Microbiology and Biotechnology, 2017
- 7) Session Chair, “Experiences in engineering education”, International Technology, Education and Development Conference, 2017

### ***Reviewer/Other Professional Services***

- 1) Ad-hoc reviewer for USDA/NIFA, USDA/SBIR, IECTR, NSF, DOE, etc., 2017-2023
- 2) Panel reviewer for USDA/NIFA, NSF, DOE, etc., 2017-2023
- 3) Ad-hoc reviewer for UKY CAFE hatch proposals, 2019-2020
- 4) Judge for Boyd-Scott Graduate Research Award (ASABE), 2016-2018
- 5) Judge for Junior Kentucky Academy of Science, 2017
- 6) Served on Annual Industrial Advisory Board Meeting of National Science Foundation (NSF) Project #1601636 - Community College (BCC) - City University of New York (CUNY), 2018
- 7) Editorial board: *Fermentation* (a MDPI journal), 2016-present
- 8) Guest editor: Sustainable Bioenergy and Bioproducts from Biowastes for *AIMS Energy* journal, 2019
- 9) Technical reviewer of 200+ manuscripts for 30+ journals:

*ACS Sustainable Chemistry and Engineering, Applied Biochemistry and Biotechnology, Applied Catalysis A, Applied Engineering in Agriculture, Biological Engineering, Biomass and Bioenergy, Bioprocess and Biosystems Engineering, Bioresource Technology, Biotechnology and Bioprocess Engineering, Biotechnology for Biofuels, BMC Biotechnology, Energy & Environmental Science, Energy and Fuels, Enzyme and Microbial Technology, Fermentation, Green Chemistry, Industrial Biotechnology, Industrial & Engineering Chemistry Research, Industrial Crops and Products, International Journal of Agricultural*

*and Biological Engineering, Journal of Chemical Education, Journal of Agricultural and Food Chemistry, Journal of the American Chemical Society, Process Biochemistry, Protist, RSC Advances, Science, Transaction of the ASABE, etc.*

### **PROFESSIONAL DEVELOPMENT**

- 1) Attended Experienced Leader Academy, 2023
- 2) Attended Promotion and Tenure workshop organized by CAFE Faculty Council, 2019
- 3) Attended a Unconscious Bias Training organized by KY NSF EPSCoR, 2018
- 4) Attended a NSF CAREER workshop hosted by the NSF CMMI division, Charlotte, NC, 2018
- 5) Attended a KY NSF EPSCoR Workshop: Improving Leadership & Teamwork with MBTI, 2017
- 6) Attended UTIA and UK Grant Writers Workshop, Knoxville, TN, UK Research, 2017
- 7) Selected to *Faculty Fellow*, Presentation U! Cohort 7, University of Kentucky, 2016
- 8) Attended a number of workshops on teaching enhancement *via* University of Kentucky eLII award and Presentation U Faculty Fellow, 2015-17
- 9) Attended NSF Super Communicator Workshop, 2016
- 10) Attended several grant writing workshops organized by UK PDO and VPR, such as NSF CAREER Workshop, Peer Review/Responding to Reviewers, etc., 2015-17
- 11) Attended "Mentoring in a Professional Context" organized by KY NSF EPSCoR

### **PROFESSIONAL AFFILIATION/CERTIFICATION**

- American Society of Agricultural and Biological Engineers (ASABE), 2006-present
- The Society for Industrial Microbiology (SIM), 2008-present
- American Institute of Chemical Engineers (AIChE), 2009-present
- Association of Chinese Agricultural, Biological, and Food Engineers (AOCABFE), 2006-present
- Bioconversion and Bioprocesses (ASABE), PRS-28; Energy Systems (ES), 2010-present
- *Engineer in Training (EIT)*, A-22277, North Carolina, 2006
- Certified IMG user for microbial genomics & metagenomics, JGI, 2014

### **CONFERENCE PAPERS AND PRESENTATIONS**

#### ***Invited Seminars***

- 1) **J Shi**. Biological and Agricultural Engineering, University of California at Davis, 9/27/2023
- 2) **J Shi**. Institute for Decarbonization and Energy Advancement, University of Kentucky, 9/16/2023
- 3) **J Shi**. Chemistry Department, Universidade Nova de Lisboa, 5/18/2023
- 4) **J Shi**. Department of Microbiology and Cell Science, University of Florida, 3/20/2023 (virtual)

- 5) **J Shi**. Biosystems Engineering Department, Auburn University, 2/8/2022 (virtual)
- 6) **J Shi**. Department of Chemical and Materials Engineering, University of Kentucky, 9/30/2020 (virtual)
- 7) **J Shi**. College of Biosystems Engineering and Food Science, Zhejiang University, 2019
- 8) **J Shi**. College of Light Industry and Food Engineering, Nanjing Forestry University, 2019
- 9) **J Shi**. Institute of Biomass Chemistry and Technology, Beijing Forestry University, 2017
- 10) **J Shi**. College of Engineering, China Agricultural University, 2017
- 11) **J Shi**. Center of Membrane Sciences, University of Kentucky, 2016

#### ***Invited Talks***

- 12) T Barzee\*, **J Shi**. Finding Common Ground in Upgrading Ag Processing Byproducts: From Renewable Battery Materials to Stillage Mushrooms. Oral presentation at the 45th Symposium on Biotechnology for Fuels and Chemicals, Portland, OR, 05/01/2023
- 13) B Ai, J Hunter, Q Qiao, Q Shao, **J Shi\***. Natural deep eutectic solvent mediated biomass deconstruction. Oral presentation at the 44th Symposium on Biotechnology for Fuels and Chemicals, New Orleans, LA, 05/02/2022
- 14) L Das, S Xu, **J Shi\***. Characterization and catalytic upgrading of deep eutectic solvent extracted sorghum lignin to phenolic compounds. Oral presentation at the 40th Symposium on Biotechnology for Fuels and Chemicals, Clearwater, FL, 05/01/2018
- 15) **J Shi\***. Exploring catalytic conversion of lignin in ionic liquids via catalysis and biocatalysis, 2017 Southeast Regional Meeting (SERMACS), Charlotte, NC, 11/10/2017
- 16) L Das, S Xu, **J Shi\***. Catalytic oxidation and depolymerization of lignin in ionic liquids. Oral presentation at the 39th Symposium on Biotechnology for Fuels and Chemicals, San Francisco, CA, 05/02/2017
- 17) L Das, E Liu, A Saeed, DW Williams, C Li, AE Ray, **J Shi\***. Biofuels and bioproduct potentials of industrial hemp in comparison with kenaf, switchgrass and biomass sorghum. Oral presentation at the 39th Symposium on Biotechnology for Fuels and Chemicals, San Francisco, CA, 05/03/2017
- 18) L Das, J Stevens, R Kalinoski, **J Shi\***. Catalytic conversion of lignin in ionic liquids via catalysis and biocatalysis. Oral presentation at the 2016 Frontier in Biorefining, St Simons Island, GA, 11/04/2016
- 19) E Liu, L Das, **J Shi\***. Lignin fractionation and characterization from engineered switchgrass. Oral presentation at the 38th Symposium on Biotechnology for Fuels and Chemicals, Baltimore, MD, 04/26/2016
- 20) **J Shi\***, Pattathil S, Ramakrishnan P, Venkatachalam S, Hahn MG, Chapple C, Simmons BA and Singh S. Impact of lignin composition on biomass recalcitrance of engineered Arabidopsis. 36th Symposium on Biotechnology for Fuels & Chemicals, April 28-May 1, 2014, Clearwater Beach, FL.
- 21) **J Shi\***, J.M. Gladden, P. Kambam, L. Sandavol, S. Zhang, S.W. Singer, B.A. Simmons, S. Singh. Consolidated “one-pot” ionic liquid (IL) pretreatment and saccharification of switchgrass using a thermostable, IL tolerant enzyme cocktail. 35th Symposium on Biotechnology for Fuels & Chemicals, May 2, 2013, Portland, OR.

#### ***Other Podium and Poster Presentations***

- 1) Vin-Nnajofofor. M.C., **Shi, J.**, 2019 AIChE Annual Meeting, "Evaluating endocarp biomass as potential feedstocks for biorefinery," Orlando, FL. (November 10, 2019)
- 2) Stevens, J., **Shi, J.**, 2019 AIChE Annual Meeting, "Understanding beneficial laccase-ionic liquid interactions with *in silico* techniques," Orlando, FL. (November 11, 2019)
- 3) Li, W., Cheng, Y.-T., **Shi, J.**, 2019 Carbon conference, "Characterization and investigation of lignin derived silicon-carbon nanocomposite anode for lithium-ion battery," Lecture, International, Lexington, KY, United States. (July 14, 2019)
- 4) Li, W., Cheng, Y.-T., **Shi, J.**, 2019 Annual International Meeting of American Society of Agricultural and Biological Engineers, "Understanding co-pyrolysis of lignin with silicon nanoparticles," Lecture, International, Boston, MA, United States. (July 7, 2019)
- 5) Li, W., Cheng, Y.-T., **Shi, J.**, 2019 American Chemical Society Spring National Meeting, "Understanding co-pyrolysis of lignin with silicon nanoparticles," Lecture, International, Orlando, FL, United States. (March 31, 2019)
- 6) Kalinoski, R., **Shi, J.**, 2018 AIChE Annual Meeting, "Exploring Antimicrobial Properties of Lignin Derived Compounds and Materials," AIChE, Lecture, International, Pittsburg, PA, United States. (October 30, 2018).
- 7) Muley, P., Boldor, D., **Shi, J.**, Lynn, B. C., 2018 AIChE Annual Meeting, "Microwave Assisted Lignin Depolymerization Using Deep Eutectic Solvents," AIChE, Poster, International, Pittsburg, PA, United States. (October 29, 2018).
- 8) Stevens, J., Mobley, J., Das, L., Rodgers, D., **Shi, J.**, 2018 AIChE Annual Meeting, "Towards Biocatalytic Lignin Valorization in Aqueous Ionic Liquids Using Thermophilic Laccases," AIChE, Lecture, International, Pittsburg, PA, United States. (October 29, 2018).
- 9) Li, W., Amos, K., Li, M., Pu, Y., Ragauskas, A. J., Debolt, S., **Shi, J.**, 2018 AIChE Annual Meeting, "Characterization of Deep Eutectic Solvent Extracted Lignin Streams from Endocarp Biomass," AIChE, Lecture, International, Pittsburg, PA, United States. (October 28, 2018).
- 10) Li, X., Das, L., **Shi, J.**, Tharayil, N., Zheng, Y., 2018 Annual International Meeting of American Society of Agricultural and Biological Engineers, "A Novel Platform for Bioupgrading of Lignin to Valuable Nutraceuticals and Pharmaceuticals," Lecture, International, Detroit, MI, United States. (July 31, 2018).
- 11) Kalinoski, R., Dodge, L., Nokes, S. E., **Shi, J.**, 2018 Annual International Meeting of American Society of Agricultural and Biological Engineers, "Antimicrobial Properties of Lignin in Lignocellulosic Hydrogels and Lignin Derived Compounds," Lecture, International, Detroit, MI, United States. (July 31, 2018).
- 12) Li, W., Cheng, Y.-T., **Shi, J.**, 2018 Annual International Meeting of American Society of Agricultural and Biological Engineers, "Lignin derived carbon-silicon nanocomposite materials for energy storage applications," Lecture, International, Detroit, MI, United States. (July 31, 2018).
- 13) Li, W., DeBolt, S., **Shi, J.**, 2018 Annual International Meeting of American Society of Agricultural and Biological Engineers, "Fractionation and characterization of lignin from endocarp biomass using deep eutectic solvent," Lecture, International, Detroit, MI, United States. (July 30, 2018).
- 14) Das, L., Li, W., Williams, D. W., Hu, H., L, C., Ray, A. E., **Shi, J.**, 2017 AIChE Annual Meeting, "Evaluation of Industrial Hemp Varieties As Potential Biomass Feedstock for Biofuels and Bioproducts," Lecture, International, Minneapolis, MN, United States. (November 2, 2017).

- 15) Das, L., Stevens, J., Liu, E., **Shi, J.**, 2017 AIChE Annual Meeting, "Catalytic Conversion of Lignin in Ionic Liquids Via Catalysis and Biocatalysis," Lecture, International, Minneapolis, MN, United States. (November 1, 2017).
- 16) Lee, G. Y., Shi, J., 2018 Annual International Meeting of American Society of Agricultural and Biological Engineers, "Effect of Substrate Characteristics on Bacterial Growth and Sporulation of Two Biocontrol Microorganisms During Solid State Cultivation," Poster, International, Detroit, MI, United States. (July 31, 2018).
- 17) Kalinoski, R., Olaleye, A., Shi, J., 2018 Annual International Meeting of American Society of Agricultural and Biological Engineers, "Optimization of Lipo-chitooligosaccharides Production by Solid State Cultivation of *Bradyrhizobium japonicum* on Sweet Sorghum Bagasse," Poster, International, Detroit, MI, United States. (July 31, 2018).
- 18) Li, W., Zhang, Y., Das, L., Wang, Y., Kim, D. Y., Cheng, Y.-T., Shi, J., 40th Symposium on Biotechnology for Fuels and Chemicals, "Impact of Lignin Sources on the Derived Activated Carbon Materials for Supercapacitor Application," Poster, International, Clearwater, FL, United States. (May 2, 2018).
- 19) Stevens, J., Das, L., Rodgers, D., Shi, J., 40th Symposium on Biotechnology for Fuels and Chemicals, "Lignin decomposition via biocatalysis in aqueous ionic liquids," Poster, International, Clearwater, FL, United States. (May 2, 2018).
- 20) Dodge, L., Sue, N. E., Shi, J., 255th ACS National Meeting & Exposition, "Fractionation of lignin derived compounds from thermochemical processed lignin towards antimicrobial properties," Poster, International, New Orleans, LA, United States. (March 19, 2018).
- 21) Vin-Nnajifor, M., Shi, J., 255th ACS National Meeting & Exposition, "High value carotenoids from biorefinery waste streams," Poster, International, New Orleans, LA, United States. (March 19, 2018).
- 22) Li, W., Chen, X., Das, L., Adedeji, A. A., Shi, J., 2017 Renewable Energy & Energy Efficiency (RE3) Workshop, "Effect of pretreatment methods on biohydrogen production from industrial hemp," Poster, National, KY, United States. (May 22, 2017).
- 23) Stevens, J., Kalinoski, R., Das, L., Shi, J., 39th Symposium on Biotechnology for Fuels and Chemicals, "Exploring biocatalysis in ionic liquid for selective lignin depolymerization," Poster, International, San Francisco, CA, United States. (May 2, 2017).
- 24) Liu, E., Li, M., Das, L., Pu, Y., Crocker, M., Zhao, B., Ragauskas, A. J., Shi, J., 39th Symposium on Biotechnology for Fuels and Chemicals, "Fractionation and characterization of lignin streams from engineered switchgrass pretreated by an aqueous ionic liquid," Poster, International, San Francisco, CA, United States. (May 2, 2017).
- 25) Chirwa, U., Liu, E., Shi, J., 39th Symposium on Biotechnology for Fuels and Chemicals, "Production of biocontrol agents using soybean processing wastes," Poster, International, San Francisco, CA, United States. (May 2, 2017).
- 26) J Stevens, R Kalinoski, L Das, J Shi. Exploring biocatalysis in ionic liquid for selective lignin depolymerization. Poster presentation at the 39th Symposium on Biotechnology for Fuels and Chemicals, San Francisco, CA, 05/02/2017
- 27) E Liu, M Li, L Das, Y Pu, M Crocker, B Zhao, AJ Ragauskas, J Shi. Fractionation and characterization of lignin streams from engineered switchgrass pretreated by an aqueous ionic liquid. Poster presentation at the 39th Symposium on Biotechnology for Fuels and Chemicals, San Francisco, CA, 05/02/2017

- 28) E Liu, L Das, B Zhao, M Crocker, J Shi. Fractionation and characterization of lignin streams from engineered switchgrass. Poster presentation at the 2016 Frontier in Biorefining, St Simons Island, GA, 11/04/2016
- 29) E Liu, L Das, J Shi. Lignin fractionation and characterization from engineered switchgrass. Oral presentation at the 2016 Annual International Meeting of American Society of Agricultural and Biological Engineers, Orlando, FL, 07/18/2016
- 30) L Das, J Shi. Catalytic oxidation of lignin in ionic liquids. Oral presentation at the 2016 Annual International Meeting of American Society of Agricultural and Biological Engineers, Orlando, FL, 07/20/2016
- 31) U Chirwa, E Liu, J Shi. Bioprocessing of soybean processing waste for bacterial biocontrol agents. Poster presentation at the 2016 Annual International Meeting of American Society of Agricultural and Biological Engineers, Orlando, FL, 07/19/2016
- 32) E Liu, J Shi. Comparing three pretreatment methods for lignin fractionation from engineered switchgrass. Oral presentation at KY NSF Super Collider 2016, Lexington, KY, 02/26/2016
- 33) Shi J, Sun J, Sun N, Tran K, Simmons BA, and Singh S. Strategies for efficient and cost-effective ionic liquid recycle and product recovery, Gordon Research Conference – Ionic liquids, August 17-22, 2014 Newry, ME.
- 34) Pattathil S, Chundawat SPS, Li M, Shi J, Kandemkavil S, Venkatachalam S, DeMartini J, Hodge DB, Wyman CE, Singh S, Simmons BA, Dale BE and Hahn MG. Analyses of changes in composition and extractability of cell wall glycans in plant biomass subjected to leading pretreatment technologies. 36th Symposium on Biotechnology for Fuels and Chemicals, April 28-May 1, 2014, Clearwater Beach, FL.
- 35) Shi J, Pattathil S, Venkatachalam S, Hahn MG, Simmons BA and Singh S. Unveiling ionic liquid deconstruction of lignocellulosic biomass using glycome profiling. 36th Symposium on Biotechnology for Fuels and Chemicals, April 28-May 1, 2014, Clearwater Beach, FL.
- 36) Parthasarathi R, Shi J, Sun N, Simmons BA and Singh S. Towards a predictive control for ionic liquid enabled lignocellulosic biomass conversion: computational perspective. 36th Symposium on Biotechnology for Fuels and Chemicals, April 28-May 1, 2014, Clearwater Beach, FL.
- 37) Singh S, Socha, AM, Parthasarathi R, Shi J, Pattathil S, Whyte D, Bergeron M, Venkatachalam S, Hahn MG, Simmons BA, Efficient Biomass Pretreatment using Renewable Ionic Liquids Derived from Lignin and Hemicelluloses, DOE-GSP 2014 Annual Meeting, Washington, DC, February 09-12, 2014.
- 38) Shi J, Parthasarathi R, Sathitsuksanoh N, Zhang S, Stavila V, Simmons BA, Singh S (2013) Understanding pretreatment of lignocellulosic biomass with ionic liquid-water mixtures, AIChE Annual Meeting, San Francisco, CA, November 3-8, 2013
- 39) Shi J, Zhang S, Cu T, Thompson VS, Yancey NA, Simmons BA, Singh S (2013) Impact of mixed feedstocks and feedstock densification on ionic liquid pretreatment efficiency, DOE-GSP Annual Meeting, Washington, DC, February 25-27, 2013.
- 40) Shi J, Jin Y\*, Ebrik M, and Wyman CE (2010) Improving simultaneous saccharification and co-fermentation (SSCF) performance by optimizing biomass and enzyme loadings. *AIChE 2010 Annual Meeting*, November 9<sup>th</sup>, Salt Lake City, UT.
- 41) Jin Y\*, Shi J, Shen J, and Wyman CE (2010) Modeling for identification of operating strategies for continuous simultaneous saccharification and co-fermentation (cSSCF). *AIChE 2010 Annual Meeting*, November 11<sup>th</sup>, Salt Lake City, UT.



- 42) Zhang T\*, Shi J, and Wyman CE (2010) Comparison of one and two step methods for producing jet fuel building blocks from cellulosic biomass: hemicellulose release and levulinic acid production from maple wood. *AIChE 2010 Annual Meeting*, November 9<sup>th</sup>, Salt Lake City, UT.
- 43) Shi J\*, Redmond T, Ebrik M, and Wyman CE (2010) Effect of water soluble sugars on total sugar yields from dilute acid pretreatment and enzymatic hydrolysis of switchgrass varieties. *The ASABE International Annual Meeting*, June 21<sup>st</sup>, Pittsburg, PA.
- 44) Shi J\*, Ebrik M, Wyman CE (2010) Understanding possible causes of slow hydrolysis rate through a restart approach. *The 32nd Symposium on Biotechnology for Fuels and Chemicals*, April 18-24, Clearwater, FL.
- 45) Zhang T, Shi J, Wyman CE (2010) Production of reactive intermediates for Aqueous Phase Processing (APP). Surface Catalysis for Energy Program Review Meeting, October 13-14, 2009, San Diego, CA
- 46) Shi J\*, Ebrik M, Redmond T, et al. (2009) Properties of cellulase and hemicellulase enzymes and their interaction with switchgrass processed by leading pretreatment technologies. *The AIChE 2009 Annual Meeting*, November 9-13, Nashville, TN
- 47) Shi J\*, Yang B, Wyman CE (2009) Evaluation of cellulose reactivity with CBH1 and/or EG2 during hydrolysis. *The AIChE 2009 Annual Meeting*, November 9-13, 2009, Nashville, TN
- 48) Shi J, Yang B\*, Wyman CE, Ramaswamy S and Huang H-J (2009) The potential of cellulosic ethanol production from municipal solid waste: a technical and economic evaluation. *The AIChE 2009 Annual Meeting*, November 9-13, Nashville, TN
- 49) Shi J, Qing Q, Yang B\*, and Wyman CE (2009) Key factors controlling enzymatic hydrolysis of cellulosic biomass. *The 2009 World Congress on Industrial Biotechnology and Bioprocessing*, July 21<sup>st</sup>, Montreal, Canada
- 50) Shi J\*, Ebrik M, Yang B, and Wyman CE (2009) Limiting factors of enzymatic hydrolysis of lignocellulosic biomass at high solids loadings. *The 31st Symposium on Biotechnology for Fuels and Chemicals*, May 3-6, San Francisco, CA.
- 51) Shi J, Redmond T\*, Ebrik M, Yang B, and Wyman CE (2009) Sugar yields from switchgrass for dilute acid and sulfur dioxide pretreatment and subsequent enzymatic hydrolysis. *The 31st Symposium on Biotechnology for Fuels and Chemicals*, May 3-6, San Francisco, CA.
- 52) Shi J\*, Yang B, and Wyman CE (2009) Fundamentals of enzymatic hydrolysis of cellulose through a restart approach. *The 31st Symposium on Biotechnology for Fuels and Chemicals*, May 3-6, San Francisco, CA.
- 53) Ebrik M\*, Shi J, Yang B, and Wyman CE (2009) Comparison of sugar yields from pretreatment and enzymatic hydrolysis of different fractions of municipal solid waste. *The 31st Symposium on Biotechnology for Fuels and Chemicals*, May 3-6, San Francisco, CA.
- 54) Shi J, Pu Y, Yang B\*, Ragauskas A, and Wyman CE (2009) A comparison of batch tube and microwave reactors for water-only and dilute acid pretreatment of corn stover. *The 31st Symposium on Biotechnology for Fuels and Chemicals*, May 3-6, San Francisco, CA.
- 55) Shi J\*, Ebrik M, Yang B, and Wyman CE (2008) Sugar yields from switchgrass for the coupled operations of dilute acid and sulfur dioxide pretreatment and enzymatic hydrolysis. *The AIChE 2008 Annual Meeting*, November 16-21, Philadelphia, PA
- 56) Shi J, Yang B\*, and Wyman CE. (2008) The potential of cellulosic ethanol production from municipal solid waste. *The AIChE 2008 Annual Meeting*, November 16-21, Philadelphia, PA

- 57) Shi J\*, Yang B, Larenas E, Mitchinson C and Wyman CE (2008) Evaluation of cellulose reactivity with purified enzyme components during hydrolysis. *The AIChE 2008 Annual Meeting*, November 16-21, Philadelphia, PA
- 58) Ebrik M\*, Shi J, Brethauer S, Studer M, Yang B, and Wyman CE (2008) Water-only and dilute acid pretreatment of aspen wood for sugar generation, *UCR Tech Horizons Conference 2008*. May 11<sup>th</sup>, Riverside, CA. (2008 Tech Horizons Conference Poster Awards – First Place winner)
- 59) Shi J, Yang B\*, Larenas E, Mitchinson C, and Wyman CE (2008) Fundamentals of enzymatic hydrolysis of cellulose through a restart approach, *the 30th Symposium on Biotechnology for Fuels and Chemicals*, May 4-7<sup>th</sup>, New Orleans, LA.
- 60) Lu J\*, Shi J, Shi L, Tsui P, Amegadzie B, and Sweet R (2007) High throughput sequence analysis system for antibody and peptide-phageinformatics, *the 2007 Centocor R&D Science Day*. Aug 21<sup>st</sup>, Philadelphia, PA.
- 61) Shi J\*, Sharma-Shivappa RR, and Chinn MS (2007) Effects of fungal pretreatment on enzymatic saccharification and fermentation of cotton stalks to fuel ethanol, Presented at *the ASABE International Annual Meeting*, June 19th, Minnesota, MN.
- 62) Shi J (2007) Potentials of fungal pretreatment technology for biomass-to-ethanol conversion. *International Conference on the Critical Technology of Biomass Energy*. (Presented by Donghai Su\*) April 17<sup>th</sup>, Beijing, China
- 63) Shi J\*, Sharma-Shivappa RR, and Chinn MS (2006) Studying the kinetics of microbial pretreatment of cotton stalks by *Phanerochaete chrysosporium*, Presented at *the ASABE International Annual Meeting*, July 12th, Portland, OR.
- 64) Shi J\*, Sharma-Shivappa RR, and Chinn MS (2005) Microbial pretreatment of cotton stalk by *Phanerochaete chrysosporium* for bioethanol production, Presented at *the ASAE International Annual Meeting*, July 19th, Tampa, FL.
- 65) Shi J\*, Sharma-Shivappa RR, Hinestroza J, and Harrell EL (2005) Selective membranes for the separation of bioethanol from plant biomass, Presented at *the ASABE International Annual Meeting*, July 19th, Tampa, FL.
- 66) Shi J\* (2005) Microbial and Supercritical CO<sub>2</sub> Pretreatments as environmentally sound approaches for conversion of cotton stalks to fuel ethanol, Presented at *International Research Exposition*, April 18th, NC State University, Raleigh, NC.

## **MEDIA COVERAGE**

### ***Since joining UK***

- 1) "[UKNow](#)" (Nov. 6, 2020). UK Researchers Launch \$2 Million Project to Study Sulfur Variability in Biofuel Feedstocks, [Link](#)
- 2) "CAFE News" (Aug. 10, 2020). Dual-purpose hemp cultivars have best biofuel potential, [Link](#)
- 3) "Biofuels Digest" (August 13, 2020). University of Kentucky researchers show dual-purpose hemp cultivars best for bioenergy, [Link](#)
- 4) "[UKNow](#)" (February 25, 2019). BAE Honor Society Book Drive Promotes Literacy. KY, United States. (<https://uknow.uky.edu/student-and-academic-life/bae-honor-society-book-drive-promotes-literacy>)

- 5) "Glasgow Daily Times" (August 25, 2018). UK researchers to use lignin to make batteries. KY, United States.  
([https://www.glasgowdailytimes.com/community/uk-researchers-to-use-lignin-to-make-batteries/article\\_dda43355-c15e-5a25-a617-9c45d80933e1.html](https://www.glasgowdailytimes.com/community/uk-researchers-to-use-lignin-to-make-batteries/article_dda43355-c15e-5a25-a617-9c45d80933e1.html))
- 6) "Richmond Register" (August 23, 2018). Can peach pits, walnut shells power your cell phone?, United States.  
([https://www.richmondregister.com/news/can-peach-pits-walnut-shells-power-your-cell-phone/article\\_d5b5ef1e-a034-5a0f-b359-68a7fab661ac.html](https://www.richmondregister.com/news/can-peach-pits-walnut-shells-power-your-cell-phone/article_d5b5ef1e-a034-5a0f-b359-68a7fab661ac.html))
- 7) "UKNow" (August 22, 2018). Can Peach Pits, Walnut Shells Power Your Cell Phone? KY, United States.  
(<https://uknow.uky.edu/research/can-peach-pits-walnut-shells-power-your-cell-phone>)
- 8) "Kentucky Kernel", (February 20, 2018). UK fraternity hosts book drive for local charity organization. KY, United States.  
([http://www.kykernel.com/features/uk-fraternity-hosts-book-drive-for-local-charity-organization/article\\_0df20744-165a-11e8-a7f7-775484bc17a8.html](http://www.kykernel.com/features/uk-fraternity-hosts-book-drive-for-local-charity-organization/article_0df20744-165a-11e8-a7f7-775484bc17a8.html))
- 9) "Science Daily", (July 21, 2016). Scientists harness CO2 to consolidate biofuel production process, Rockville, MD, United States.  
(<https://www.sciencedaily.com/releases/2016/07/160721104605.htm>)
- 10) "R&D Magazine", (Jan 19, 2016). One-stop shop for biofuels. Rockaway, NJ, United States.  
(<https://www.rdworldonline.com/one-stop-shop-for-biofuels/>)
- 11) "Science Daily", (Jan 19, 2016). One-stop shop for biofuels. Rockville, MD, United States.  
(<https://www.sciencedaily.com/releases/2016/01/160119151249.htm>)

### ***Before joining UK***

- 12) "Biofuels Digest", (June 15, 2015). Why we have a Joint BioEnergy Institute: the story of ionic liquids, Miami, FL, United States.  
(<http://www.biofuelsdigest.com/bdigest/2015/06/15/why-we-have-a-joint-bioenergy-institute-the-story-of-ionic-liquids/>)
- 13) "Science Daily", (Aug 18, 2014). Bionic liquids from lignin: New results pave the way for closed loop biofuel refineries, Rockville, MD, United States.  
(<https://www.sciencedaily.com/releases/2014/08/140818152519.htm>)
- 14) "E&E News", (Oct 13, 2013). Quest for cheap, nonfood biofuel starts with a brewery, Washington, D.C., United States.  
(<https://www.eenews.net/stories/1059988623/print>)
- 15) "Science Daily", (Aug 13, 2013). One-pot to prep biomass for biofuels. Rockville, MD, United States.  
(<https://www.sciencedaily.com/releases/2013/08/130814101433.htm>)
- 16) "DOE Pulse" feature article, (April 1, 2013). Vintage biofuel: a Joint Bioenergy Institute blend,  
(<https://web.ornl.gov/info/news/pulse/no385/feature.shtml>)
- 17) "Biomass Magazine", (Feb 01, 2013). Researchers use ionic liquid to pretreat biofuel feedstock mix. Grand Forks, ND. United States.

(<http://biomassmagazine.com/articles/8595/researchers-use-ionic-liquid-to-pretreat-biofuel-feedstock-mix>)

- 18) "[Science Daily](#)", (Jan 30, 2013). Biofuels blend right in: Researchers show ionic liquids effective for pre-treating mixed blends of biofuel feedstock, Rockville, MD, United States.  
(<https://www.sciencedaily.com/releases/2013/01/130130132449.htm>)
- 19) "[ACS News](#)" Weekly PressPac, (Sept 12, 2012). White rot fungus boosts ethanol production from corn stalks, cobs and leaves, Washington, D.C., United States.  
(<https://www.acs.org/content/acs/en/pressroom/presspacs/2012/acs-presspac-september-12-2012.html>)
- 20) "[Science Daily](#)", (Jan 11, 2012). Engineers make 'building blocks of chemical industry' from wood while boosting production 40 percent. Rockville, MD, United States.  
(<https://www.sciencedaily.com/releases/2012/01/120110192727.htm>)

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