

DR. HANWU LEI

Associate Professor

Bioproducts, Sciences and Engineering Laboratory

Department of Biological Systems Engineering

Washington State University

Email: hlei@wsu.edu; Phone: 509-372-7628; Web: <https://labs.wsu.edu/lei/>

EDUCATION

- 1/2006 **Ph.D.** in Biosystems and Agricultural Engineering, University of Minnesota, Twin-Cities
1/2003 **M.S.** in Biosystems and Agricultural Engineering, University of Minnesota, Twin-Cities
7/1992 **B.S.** in Grain Science and Engineering, Wuxi University of Light Industry, China

PROFESSIONAL EXPERIENCE

- 8/15- **Associate Professor** (tenured) and **Scientist**, Bioproducts, Sciences and Engineering Laboratory, Department of Biological Systems Engineering, Washington State University
8/09-8/15 **Assistant Professor** and **Scientist**, Bioproducts, Sciences and Engineering Laboratory, Department of Biological Systems Engineering, Washington State University
12/07-8/09 **Assistant Professor, Bioprocess Engineer, and Graduate Faculty**, Agricultural and Biosystems Engineering Department, South Dakota State University
1/06-12/07 **Research Associate** and **Process Engineer**, Department of Bioproducts and Biosystems Engineering, University of Minnesota, Twin-Cities
1/01-12/05 **Research Assistant**, Department of Bioproducts and Biosystems Engineering, Department of Food Science and Nutrition, University of Minnesota, Twin-Cities
6/95-12/00 **Manager** and **Process Engineer** of Producing and Technology Department, Sichuan Agricultural and Sideline Products Processing Technology Development Corporation, China
7/92-6/95 **Technical Supervisor** and **Engineer**, Dongfeng Wheat Flour Mill, China

PEER-REVIEWED JOURNAL ARTICLES (77) (* indicates corresponding author; * indicates corresponding author in the review process; underline indicates my students with me as major advisor)

2017 Published Peer-Reviewed Journal Papers (4):

77. G. Yadavalli, **H. Lei***, Y. Wei, L. Zhu, X. Zhang, Y. Liu, D. Yan. 2016. Carbon dioxide capture using ammonium sulfate surface modified activated biomass carbon. *Biomass and Bioenergy*. doi: 10.1016/j.biombioe.2017.01.015.
76. X. Zhang, **H. Lei***, L. Zhu, M. Qian, G. Yadavalli, J. Wu, S. Chen. 2016. From plastics to jet fuel range alkanes via combined catalytic conversions. *Fuel*, 188, 28-38. 10.1016/j.fuel.2016.10.015.
75. Y. Zhang, P. Chen, Sh. Liu; P. Peng; M. Min, Y. Cheng, E. Anderson; N. Zhou, L. Fan, C. Liu, G. Chen, Y. Liu, **H. Lei**, B. Li, R. Ruan*. 2016. Effects of feedstock characteristics on microwave-assisted pyrolysis-a review. *Bioresource Technology*, doi: 10.1016/j.biortech.2017.01.046.

74. H. M. Morgan JR., Q. Bu*, J. Liang, H. Mao, A Shi, **H. Lei**, R. Ruan. 2016. A review of catalytic microwave pyrolysis of lignocellulosic biomass for value-added bio-oil production. *Bioresource Technology*, 230:112-121. doi: 10.1016/j.biortech.2017.01.059

2016 Published Peer-Reviewed Journal Papers (10):

73. X. Zhang, **H. Lei***, L. Zhu, M. Qian, G. Yadavalli, J. Wu, S. Chen. 2016. From plastics to jet fuel range alkanes via combined catalytic conversions. *Fuel*, 188, 28-38. 10.1016/j.fuel.2016.10.015.
72. X. Zhang, **H. Lei***, L. Zhu, X. Zhu, M. Qian, G. Yadavalli, J. Wu, S. Chen. 2016. Thermal behavior and kinetic study for catalytic co-pyrolysis of biomass with plastics. *Bioresource Technology*, doi: 10.1016/j.biortech.2016.08.068.
71. H. Ma, M. M. Addy, E. Anderson, W. Liu, Y. Liu, Y. Nie, P. Chen, B. Cheng, **H. Lei**, R. Ruan*. 2016. A novel process for low-sulfur biodiesel production from scum waste. *Bioresource Technology*, 214, 826-835. doi:10.1016/j.biortech.2016.05.029.
70. X. Zhang, **H. Lei***, L. Zhu, Y. Liu, G. Yadavalli, D. Yan, X. Zhu, J. Chin, M. Qian. J. Wu, S. Chen 2016. Optimizing carbon efficiency of jet fuel range alkanes from cellulose co-fed with polyethylene via catalytically combined processes. *Bioresource Technology*, 214, 45-54. doi: 10.1016/j.biortech.2016.04.086.
69. Y. Wei, **H. Lei***, L. Zhu, X. Zhang, Y. Liu, G. Yadavalli, X. Zhu, M. Qian, D. Yan. 2016. Hydrocarbon produced from upgrading rich phenolic compound bio-oil with low catalyst coking. *Fuel*, 178: 77-84. doi:10.1016/j.fuel.2016.03.039.
68. X. Zhang, **H. Lei***, L. Zhu, M. Qian, X. Zhu, J. Wu, S. Chen. 2016. Enhancement of jet fuel range alkanes from co-feeding of lignocellulosic biomass with plastics via tandem catalytic conversions. *Applied Energy*, 173, 418-430. doi: 10.1016/j.apenergy.2016.04.071.
67. Q. Bu, **H. Lei***, M. Qian, G. Yadavalli. 2016. A thermal behavior and kinetics study of the catalytic pyrolysis of lignin. *RSC Advances*, 6, 100700-100707. doi: 10.1039/C6RA22967K.
66. X. Zhang, **H. Lei***. 2016. Synthesis of high energy-density jet fuel from plastics via catalytically integral processes. *RSC advances*, 6: 6154-6163. doi: 10.1039/c5ra25327f.
65. X. Zhang, **H. Lei***, J. Wu, S. Chen. 2016. Catalytic co-pyrolysis of lignocellulosic biomass with polymers: a critical review. *Green Chemistry*, 18, 4145-4169. DOI: 10.1039/C6GC00911E.
Published and featured with Front Cover Image
64. X. Zhang, **H. Lei***, L. Zhu, M. Qian, J. C. Chan, X. Zhu, Y. Liu, G. Yadavalli, D. Yan, L. Wang, Q. Bu, Y. Wei, J. Wu, S. Chen. 2016. Development of a catalytically green route from diverse lignocellulosic biomasses to high-density cycloalkanes for jet fuels. *Catalysis Science & Technology*, 6, 4210-4220. doi: 10.1039/C5CY01623A.

2015 Published Peer-Reviewed Journal Papers (10):

63. X. Zhang, **H. Lei***, L. Zhu, J. Wu, S. Chen. 2015. From lignocellulosic biomass to renewable cycloalkanes for jet fuels. *Green Chemistry*. 17: 4736-4747. DOI: 10.1039/C5GC01583A. Published in October 2015
62. X. Zhang, **H. Lei***, L. Wang, L. Zhu, Y. Wei, Y. Liu, G. Yadavalli, D. Yan. 2015. Renewable gasoline-range aromatics and hydrogen-enriched fuel gas from biomass via catalytic microwave-induced pyrolysis. *Green Chemistry*. 17: 4029-4036. doi: 10.1039/C5GC00516G. Published in May 2015
61. X. Zhang, **H. Lei***, G. Yadavalli, L. Zhu, Y. Wei, Y. Liu. 2015. Gasoline-range Hydrocarbons produced from Microwave-induced Pyrolysis of Low-Density Polyethylene over ZSM-5. *Fuel*, 144: 33-42. doi: 10.1016/j.fuel.2014.12.013. Published in January 2015
60. K. Li, Q. Gao*, G. Yadavalli, X. Shen, **H. Lei**, B. Han, K. Xia, and C. Zhou. 2015. Selective adsorption of Gd³⁺ on a magnetically retrievable imprinted chitosan/carbon nanotube composite with high

- capacity. *ACS Applied Materials & Interfaces*. 7(38), 21047-21055. doi: 10.1021/acsami.5b07560. Published in September 2015
59. B. Xie; Y Chen*, M. Yu, X. Shen, **H. Lei**, T. Xie, Y. Zhang, Y. Wu. 2015. Carboxyl-Assisted Synthesis of Nitrogen-Doped Graphene Sheets for Supercapacitor Applications. *Nanoscale Research Letters*, 10:332-341, doi: 10.1186/s11671-015-1031-z. Published in August 2015
58. X. Zhang, **H. Lei***, L. Wang, L. Zhu, Y. Wei, Y. Liu, G. Yadavalli, D Yan, J. Wu, S. Chen. 2015. Production of renewable jet fuel range alkanes and aromatics via integrated catalytic processes of intact biomass. *Fuel*, 160:375-385. doi: 10.1016/j.fuel.2015.08.006. Published in August 2015
57. Q. Bu, **H. Lei***, L. Wang, G. Yadavalli, Y. Wei, X. Zhang, L. Zhu, Y. Liu. 2015. Biofuel production from catalytic microwave pyrolysis of Douglas fir pellets over ferrum-modified carbon catalyst. *Journal of Analytical and Applied Pyrolysis*, 112: 74-79. doi: 10.1016/j.jaap.2015.02.019. Published in March 2015.
56. **Invited Peer-Reviewed Journal Paper:** Y. Wei, **H. Lei***, L. Zhu, X. Zhang, G. Yadavalli, Y. Liu, D. Yan. 2015. Oxygen-containing fuels from high acid water phase pyrolysis bio-oils by ZSM-5 catalysis: kinetic and mechanism studies. *Energies*, 8(6), 5898-5915; doi:10.3390/en8065898. Published in June 2015.
55. L. Zhu, **H. Lei***, L. Wang, G. Yadavalli, X. Zhang, Y. Wei, Y. Liu, S. Chen, and B. Ahring. 2015. Biochar of Corn Stover: Microwave-assisted Pyrolysis Condition Induced Changes in Surface Functional Groups and Characteristics. *Journal of Analytical and Applied Pyrolysis*. doi:10.1016/j.jaap.2015.07.012. Published in July 2015
54. X. Shen, Y. Wang*, B. Ahring, **H. Lei**, Q. Gao, H. Liu. 2015. Isomerization of hexoses from enzymatic hydrolysate of poplar sawdust using low leaching K₂MgSiO₄ catalysts for one-pot synthesis of HMF. *RSC Advances*, 5, 96990-96996. doi: 10.1039/c5ra17132f. Published in October 2015

2014 Published Peer-Reviewed Journal Papers (7):

53. L. Wang, **H. Lei****, Q. Bu, L. Zhu, Y. Wei, X. Zhang, Y. Liu, G. Yadavalli, J. Lee, S. Chen, and J. Tang. 2014. Aromatic hydrocarbons production from ex-situ catalysis of pyrolysis vapor over Zinc modified ZSM-5 in a packed-bed catalysis coupled with microwave pyrolysis reactor. *Fuel*, 129C, 78-85. doi: 10.1016/j.fuel.2014.03.052. Published in April 2014.
52. Q. Bu, **H. Lei****, L. Wang, Y. Wei, L. Zhu, X. Zhang, Y. Liu, G. Yadavalli and J. Tang. 2014. Bio-based phenols and fuel production from catalytic microwave pyrolysis of lignin by activated carbons. *Bioresource Technology*, 162C, 142-147. doi: 10.1016/j.biortech.2014.03.103. Published in April 2014.
51. S. Ren, **H. Lei****, L. Wang, G. Yadavalli, Y. Liu, J. Julson. 2014. The integrated process of microwave torrefaction and pyrolysis of corn stover for biofuel production. *Journal of Analytic and Applied Pyrolysis*, 108: 248-253. doi: 10.1016/j.jaap.2014.04.008. Published in May 2014.
50. **Invited Peer-Reviewed Journal Paper:** Y. Wei, **H. Lei****, Y. Liu, L. Wang, L. Zhu, X. Zhang, G. Yadavalli, B. Ahring, S. Chen. 2014. Renewable hydrogen produced from different renewable feedstocks by aqueous-phase reforming process. *Journal of Sustainable Bioenergy Systems*, 4(2): 113-127. doi: 10.4236/jsbs.2014.42011. Published in April 2014.
49. S. Ren, **H. Lei****, L. Wang, Q. Bu, S. Chen, J. Wu. 2014. Hydrocarbons and hydrogen-rich syngas production by biomass catalytic pyrolysis and bio-oil upgrading over biochar catalysts. *RSC Advances*, 4 (21), 10731 – 10737. doi: 10.1039/c4ra00122b. Published in February 2014.
48. Q. Wang, **H. Lei**, L. Jiang, Q. Wen, W. Bai. Y. Zhong*. 2014. Optimization and evaluation of microencapsulation of star anise oleoresin. *Journal of Food Processing and Preservation*. 38(5):2129-2136. doi:10.1111/jfpp.12193. Published in December 2013.

47. Y. Wei, **H. Lei***, L. Wang, L. Zhu, X. Zhang, Y. Liu, S. Chen, B. Ahring. 2014. Liquid-liquid extraction of biomass pyrolysis bio-oil. *Energy and Fuels*, 28(2), 1207-1212. doi: 10.1021/ef402490s. Published in January 2014.

2013 Published Peer-Reviewed Journal Papers (11):

46. **Invited Peer-Reviewed** Journal Paper: **H. Lei***, I. Cybulska, J. Julson. Hydrothermal pretreatment of lignocellulosic biomass and kinetics. *Journal of Sustainable Bioenergy Systems*, 3(4): 250-259. doi: 10.4236/jsbs.2013.34034. Published in December 2013.
45. S. Ren, **H. Lei***, L. Wang, Q. Bu, S. Chen, J. Wu. 2013. Thermal behavior and kinetic study for woody biomass torrefaction and torrefied biomass pyrolysis by TGA. *Biosystems Engineering*, 116, 4, 420-426. doi: 10.1016/j.biosystemseng.2013.10.003. Published in October 2013.
44. L. Wang, **H. Lei***, J. Lee, S. Chen, J. Tang, B. Ahring. 2013. Aromatic hydrocarbons from packed-bed catalysis coupled with microwave pyrolysis of Douglas fir sawdust pellets. *RSC Advances*, 3, 3, 14609 – 14615. doi: 10.1039/C3RA23104F. Published in Aug. 2013.
43. Q. Bu, **H. Lei***, L. Wang, Y. Liu, J. Liang, Y. Wei, L. Zhu, and J. Tang. 2013. Renewable phenols production by catalytic microwave pyrolysis of Douglas fir sawdust pellets with activated carbon catalysts. *Bioresource Technology*, 142: 546-552. doi: 10.1016/j.biortech.2013.05.073. Published in August 2013.
42. S. Ren, **H. Lei***, L. Wang, Q. Bu, S. Chen, J. Wu, J. Julson, and R. Ruan. 2013. The effects of torrefaction on compositions of bio-oil and syngas from biomass pyrolysis by microwave heating. *Bioresource Technology*, 135, 659-994. doi: 10.1016/j.biortech.2012.06.091. Published in April 2013.
41. B. Hu, W. Zhou, M. Min, Z. Du, P. Chen, X. Ma, Y. Liu, **H. Lei**, J. Shi, R. Ruan*. 2013. Development of an effective acidogenically digested swine manure-based algal system for improved wastewater treatment and biofuel and feed production. *Applied Energy*, 107, 255-263. doi: 10.1016/j.apenergy.2013.02.033. Published in March 2013.
40. R. Zhou, **H. Lei***, J. Julson. 2013. Reaction temperature and time and particle size on switchgrass microwave pyrolysis and reaction kinetics. *Int. J. Agr. Biol. Eng.*, 6(1): 53-61. doi: 10.3965/j.ijabe.20130601.005. Published in March 2013.
39. Z. Du, X. Ma, Y. Li, P. Chen, Y. Liu, X. Lin, **H. Lei**, R. Ruan*. 2013. Production of aromatic hydrocarbons by catalytic pyrolysis of microalgae with zeolites: Catalyst screening in a pyroprobe. *Bioresource Technology*, 139, 397-401 doi: 10.1016/j.biortech.2013.04.053. Published in July 2013.
38. R. Zhou, **H. Lei***, J. Julson. 2013. The Effects of pyrolytic conditions on microwave pyrolysis of prairie cordgrass and kinetics. *J. Analytic and Applied Pyrolysis*, 101, 172-176. doi: 10.1016/j.jaap.2013.01.013. Published in April 2013.
37. Z. Du, B. Hu, X. Ma, Y. Cheng, Y. Liu, X. Lin, Y. Wan, **H. Lei**, P. Chen, and R. Ruan*. 2013. Catalytic pyrolysis of microalgae and their three major components: carbohydrates, proteins, and lipids. *Bioresource Technology*, 130: 777–782. doi: 10.1016/j.biortech.2012.12.115. Published in February 2013.
36. I. Cybulska*, G. P. Brudecki, B. R. Hankerson, J. L. Julson, H. Lei. 2013. Catalyzed modified clean fractionation of switchgrass. *Bioresource Technology*, 127, 92-99. doi: 10.1016/j.biortech.2012.09.131. Published in January 2013.

2012 Published Peer-Reviewed Journal Papers (11):

35. L. Wang, **H. Lei***, S. Ren, Q. Bu, J. Liang, Y. Wei, Y. Liu, G. J. Lee, S. Chen, J. Tang, Q. Zhang, and R. Ruan. 2012. Aromatics and phenols from catalytic pyrolysis of Douglas fir pellets in microwave

- with ZSM-5 as a catalyst. *J. Analytic and Applied Pyrolysis*, 98, 194–200. doi: 10.1016/j.jaap.2012.08.002. Published in September 2012.
34. S. Ren, **H. Lei***, L. Wang, Q. Bu, Y. Wei, J. Liang, Y. Liu, J. Julson, S. Chen, J. Wu, and R. Ruan. 2012. Microwave torrefaction of Douglas fir sawdust pellet. *Energy & Fuels*, 26, 5936–5943. doi: 10.1021/ef300633c. Published in August 2012.
 33. I. Cybulska*, G. Brudecki, K. Rosentrater, **H. Lei**, J. Julson. 2012. Catalyzed modified clean fractionation of prairie cordgrass integrated with hydrothermal post-treatment. *Biomass and Bioenergy*, 46, 389–401. doi: 10.1016/j.biombioe.2012.08.002. Published in August 2012.
 32. **Invited Peer-Reviewed** Journal Paper: Q. Bu, **H. Lei***, A. H. Zacher, L. Wang, S. Ren, J. Liang, Y. Wei, Y. Liu, J. Tang, Q. Zhang, and R. Ruan. 2012. A review of catalytic hydrodeoxygenation of lignin-derived phenols from biomass pyrolysis. *Bioresource Technology*, 124, 470–477. doi: 10.1016/j.biortech.2012.08.089. Published in August 2012.
 31. I. Cybulska*, G. Brudecki, K. Rosentrater, J. Julson, **H. Lei**. 2012. Comparative study of organosolv lignins extracted from prairie cordgrass, switchgrass and corn stover. *Bioresource Technology*, 118C: 30–36. doi: 10.1016/j.biortech.2012.05.073. Published in May 2012.
 30. I. Cybulska, **H. Lei***, J. Julson, G. Brudecki. 2012. Optimization of Modified Clean Fractionation of Prairie Cord Grass. *Int. J. Agr. Biol. Eng.*, 5(2): 42–51. doi: 10.3965/j.ijabe.20120502.00? Published in April 2012.
 29. B. Hu, M. Min, W. Zhou, Y. Li, M. Mohr, Y. Cheng, **H. Lei**, Y. Liu, X. Lin, P. Chen, R. Ruan*. 2012. Influence of exogenous CO₂ on biomass and lipid accumulation of microalgae *Auxenochlorella protothecoides* cultivated in concentrated municipal wastewater, *Appl. Biochem. Biotechnol.*, 166(7):1661–1673. doi: 10.1007/s12010-012-9566-2. Published in April 2012.
 28. I. Cybulska, G. Brudecki, **H. Lei***, J. Julson. 2012. Optimization of combined clean fractionation and hydrothermal post-treatment of prairie cord grass. *Energy & Fuels*, 26(4): 2303–2309. doi: 10.1021/ef300249m. Published in April 2012.
 27. Q. Wang, Z. Ou, **H. Lei**, X Zeng*, Y. Ying, W. Bai. 2012. Antimicrobial activities of a new formula of spice water extracts against foodborne bacteria. *J. food processing and preservation*, 36(4): 374–381. doi: 10.1111/j.1745-4549.2012.00691.x. Published in April 2012.
 26. S. Ren, **H. Lei***, L. Wang, Q. Bu, S. Chen, J. Wu, J. Julson, and R. Ruan. 2012. Biofuel production and kinetics analysis of microwave pyrolysis for Douglas fir sawdust pellet. *J. Analytic and Applied Pyrolysis*, 94: 163–169. doi: 10.1016/j.jaap.2011.12.004. Published in March 2012.
 25. Q. Bu, **H. Lei***, S. Ren, L. Wang, Q. Zhang, J. Tang, and R. Ruan. 2012. Production of phenols and biofuels by catalytic microwave pyrolysis of lignocellulosic biomass. *Bioresource Technology*, 108:274–279. doi: 10.1016/j.biortech.2011.12.125. Published in January 2012.

2011 Published Peer-Reviewed Journal Papers (5):

24. Q. Bu, **H. Lei***, S. Ren, L. Wang, J. Holladay, Q. Zhang, J. Tang, and R. Ruan. 2011. Phenol and phenolics from lignocellulosic biomass by catalytic microwave pyrolysis. *Bioresource Technology*, 102: 7004–7007. Published in July, 2011.
23. **H. Lei***, S. Ren, L. Wang, Q. Bu, J. Julson, J. Holladay, and R. Ruan. 2011. Microwave pyrolysis of distillers dried grain with solubles (DDGS) for biofuel production. *Bioresource Technology*, 102 (10) 6208–6213, Published in May 2011.
22. Y. Gao, W. Chen, **H. Lei***, Y. Liu, X. Lin, R. Ruan*. 2011. Optimization of Transesterification Conditions for the Production of Fatty Acid Methyl Ester (FAME) from Chinese Tallow Kernel Oil with a Nano Magnetic Catalyst. *Trans. ASABE.*, 54(3): 1169–1174. Published in July, 2011.
21. X. Lin, J. Zhang, **H. Lei***, Z. Jin, P. Chen, R. Roger*. 2011. Effects of different resistant starches on firmness and stickiness of dough by NMR evaluation. *Int. Agr. Eng. J.*, 19(4): 1–9. Published in February, 2011.

20. W. Liu, C. Liu*, J. Liu, S. Yang, H. Zheng, **H. Lei**, R. Ruan, T. Li, Z. Tu, X. Song. 2011. Medium-chain fatty acids nanoliposomes for easy energy supply. *Nutrition*, 27: 700–706. Published in May, 2011.

2010 Published Peer-Reviewed Journal Papers (6):

19. I. Cybulska, **H. Lei***, J. Julson. 2010. Hydrothermal pretreatment and enzymatic hydrolysis of prairie cord grass. *Energy & Fuels*, 24 (1): 718–727. Published in April 2010.
18. C. Yang, B. Zhang, J. Moen, K. Hennessy, Y. Liu, X. Lin, Y. Wan, **H. Lei***, P. Chen, and R. Ruan*. 2010. Fractionation and characterization of bio-oil from microwave-assisted pyrolysis of corn stover. *Int. J. Agr. Biol. Eng.*, 3(3): 54-61. Published in September 2010.
17. B. Zhang, C. Yang, J. Moen, Z. Le, K. Hennessy, Y. Wan, Y. Liu, **H. Lei**, P. Chen and R. Ruan*. 2010. Catalytic conversion of microwave-assisted pyrolysis vapors. *Energy Sources, Part A: Recovery, Utilization, and Environmental Effects*, 32(18):1756-1762. Published in July 2010.
16. X. Lin*, L. Zhang, **H. Lei***, H. Zhang, Y. Cheng, R. Zhu, R. Ruan. 2010. Effect of drying technologies on quality of green tea, *Int. Agr. Eng. J.*, 19(3): 30-37. Published in December 2010.
15. H. Ding, Y. Gao, **H. Lei***, L. Luo, H. Chao, and R. Run*. 2010. The in vitro antioxidant effects of flavonoids of sweet potato vines. *Int. J. Food Properties.*, 13(2):360-368. Published in March 2010.
14. L. Gao, Y. Liu, **H. Lei***, H. Peng, R. Ruan*. 2010. Preparation of semirigid polyurethane foam (PUF) with liquefied bamboo residues. *J. Applied Polymer Sci.*, 116, 1694–1699. Published in May 2010.

2009 Published Peer-Reviewed Journal Papers (6):

13. J. Moen, C. Yang, B. Zhang, **H. Lei***, K. Hennessy, Y. Wan, Z. Le, Y. Liu, P. Chen, R. Ruan*. 2009. Catalytic microwave assisted pyrolysis of aspen. *Int. J. Agric. & Biol. Eng.*, 2009; 2(4): 70 – 75. Published in December 2009.
12. **H. Lei***, S. Ren, and J. Julson. 2009. The effects of reaction temperature and time and particle size of corn stover on microwave pyrolysis. *Energy and Fuels*, 23, 3254–3261. Published in June 2009.
11. Y. Wang, J. Wu, Y. Wan, **H. Lei***, F. Yu, P. Chen, X. Lin, and R. Ruan*. 2009. Liquefaction of corn stover using industrial biodiesel glycerol. *Int. J. Agric. & Biol. Eng.*, 2(2): 32-40. Published in June 2009.
10. Wan, Y., X. Lin, Y. Liu, C. Yang, B. Zhang, P. Chen, **H. Lei***, and R. Ruan*. 2009. Microwave assisted pyrolysis of corn stover pellets with catalysts for bio-oil production. *Transaction of CSAE*, 25(4):190-195. Published in April 2009.
9. J. Wu, Y. Wang, Y. Wan, **H. Lei***, F. Yu, Y. Liu, P. Chen, L. Yang, R. Ruan*. 2009. Processing and properties of rigid polyurethane foams based on bio-oils from microwave-assisted pyrolysis of corn stover. *Int. J. Agric. & Biol. Eng.*, 2(1): 40-50. Published in March 2009.
8. Y. Gao, W. Chen, **H. Lei***, X. Lin, R. Ruan*, C. Chen. 2009. Optimization of esterification conditions for the production of biodiesel from Chinese tallow kernel oil with surfactant-coated lipase using surface response methodology. *Biomass and Bioenergy*, 33(2): 277-282. Published in February 2009.

2008 Published Peer-Reviewed Journal Papers (3):

7. Y. Liu, Y. Wan, **H. Lei***, R. Ruan*, C. Liu, X. Lin, M. Xie, H. Peng, D. Zheng. 2008. Starch based polyester type water resistant wood adhesive. *Transactions of the CSAE* 24(9): 309-312.
6. **H. Lei***, R. Ruan*, G. Fulcher, and B. van Lengerich. 2008. Color development in an extrusion cooked model system. *Int. J. Agric. & Biol. Eng.*, 1(2): 55-63.
5. **H. Lei***, G. Fulcher, R. Ruan*, and B. van Lengerich. 2008. Modeling mean residence time in a co-rotating twin screw extruder. *Cereal Chemistry*, 85(2):230-237.

2007 Published Peer-Reviewed Journal Papers (1):

4. **H. Lei***, G. Fulcher, R. Ruan*, and B. van Lengerich. 2007. Assessment of color development due to twin-screw extrusion of rice-glucose-lysine blend using image analysis. *LWT Journal of Food Sci. Tech.*, 40: 1224-1231.

2006 Published Peer-Reviewed Journal Papers (1):

3. **H. Lei***, G. Fulcher, R. Ruan*, and B. van Lengerich. 2006. SME-Arrhenius model for WSI of rice flour in a twin screw extruder. *Cereal Chemistry*, 83(5): 574-581.

2005 Published Peer-Reviewed Journal Papers (1):

2. **H. Lei***, G. Fulcher, R. Ruan*, and B. van Lengerich. 2005. Empirical modeling of die pressure, shaft torque, SME, and product temperature of rice flour in a co-rotating twin-screw extruder. *Cereal Chemistry*, 82(5): 582-587.

2004 Published Peer-Reviewed Journal Papers (1):

1. R. Ruan*, **H. Lei***, P. Chen, S. Deng, X. Lin, Y. Li, W. F. Wilcke, and G. Fulcher. 2004. Ozone-aided corn steeping process. *Cereal Chemistry*, 81(2):182-187.

INVITED PEER REVIEWED BOOK CHAPTER (4)

Invited 2017 Published Peer-Reviewed Book Chapters (1):

4. X. Zhang, **H. Lei***, and R. Ruan. 2017. Microwave-assisted pyrolysis of lignocellulosic biomass. In *Encyclopedia of Agricultural, Food, and Biological Engineering*. Ed. D. R. Heldman and C. I. Moraru. CRC Press. ISBN 9781439811115. Accepted.

Invited 2016 Published Peer-Reviewed Book Chapters (1):

3. Q. Bu, H. M. Morgan JR., J. Liang, **H. Lei***, R. Ruan. 2016. Catalytic microwave pyrolysis of lignocellulosic biomass. In *Advances in Bioenergy*. Eds. Y. Li, X. Ge. pp. 69–123. Elsevier. ISBN: 9780128095225.

Invited 2014 Published Peer-Reviewed Book Chapters (1):

2. L. Wang, **H. Lei***, R. Ruan. 2014. Techno-economic analysis of microwave assisted pyrolysis for production of biofuels. In *Production of Biofuels and Chemicals with Microwave and Ultrasound*, Springer Book Series - Biofuels and Biorefineries". Ed. Z. Fang, R. L. Smith, Jr., X. Qi. Springer. ISBN 978-94-017-9612-5, vol. 3, pp251-263. Published Dec 2015 **(1,2,3,4,5,6)**

Invited 2013 Published Peer-Reviewed Book Chapters (1):

1. I. Cybulska, G. Brudecki, **H. Lei***. 2013. Hydrothermal pretreatment of lignocellulosic biomass. In *Green Biomass Pretreatment and Processing Methods for Bioenergy Production*. Ed. T. Gu. Springer. ISBN: 978-94-007-6052-3. Published in January 2013. **(1,2,3,4,5,6)**

GRANTS (\$4,087,742 on projects as PI; \$42,708,518 on projects as Co-PI)

- Project Title:** Aromatic hydrocarbons from agricultural and forest wastes using biomass derived carbon catalysts
Name of Grantor: USDA NIFA
Cooperating Faculty: **H. Lei (PI/PD)**
Grant Amount: **\$494,040**
Effective Dates: 1/2016-12/2020
- Project Title:** Applying abundant plants to develop battery materials and study the benefits on agricultural economy
Name of Grantor: USDA NIFA
Cooperating Faculty: **H. Lei (PI/PD)**, K. Zhong (WSU), L. Scudiero (WSU), T. Marsh (WSU), P. Tozer (WSU)
Grant Amount: **\$494,805**
Effective Dates: 1/2015-12/2017
- Project Title:** Bio-phenols production from lignocellulosic biomass
Name of Grantor: USDA NIFA SBIR/Washington Bio-oils Inc.
Cooperating Faculty: Z. Yang (PI), **H. Lei (Co-PI/PD)**, Z. Yang, J. Canin (Washington Bio-oils Inc.), H. Sun (Washington Bio-oils Inc.)
Grant Amount: **\$100,000**
Effective Dates: 09/2016-12/2017
- Project Title:** Straw fast pyrolysis technology and key equipment cooperative research
Name of Grantor: China International Science and Technology Exchange Center Cooperation Program, China International Science and Technology Cooperation Office, Chinese Ministry of Science and Technology
Cooperating Faculty: **H. Lei (PI/PD)**, J. Liu (Tianjin Institute of Industrial Biotechnology, Chinese Academy of Science), R. Ruan (University of Minnesota)
Grant Amount: **¥10,000,000**
Effective Dates: 7/2015-6/2018
- Project Title:** High energy dense bio-fuels from a microwave conversion system: feedstocks and processes for securing bio-aromatic hydrocarbons
Name of Grantor: Commercialization Gap Fund, WSU Office of Commercialization, WSU Office of Commercialization, the Offices of the President and Provost in conjunction with the Vice President of Research, and the Washington Research foundation
Cooperating Faculty: **H. Lei (PI/PD)** and J Canin
Grant Amount: **\$39,400**
Effective Dates: 1/2015-3/2016
- Project Title:** Conversion of biomass feedstock to bio-oils by microwave pyrolysis
Name of Grantor: Creative Energy Systems
Cooperating Faculty: **H. Lei (PI/PD)**
Grant Amount: **\$27,680**
Effective Dates: 1/2015-12/2018
- Project Title:** Bio-oils from microwave pyrolysis of biomass
Name of Grantor: Creative Energy Systems

Cooperating Faculty: **H. Lei (PI/PD)**
 Grant Amount: **\$15,543**
 Effective Dates: 7/2015-12/2018

Project Title: Microwave drying of biomass feedstock with high moisture content
 Name of Grantor: Creative Energy Systems
 Cooperating Faculty: **H. Lei (PI/PD)**
 Grant Amount: **\$10,000**
 Effective Dates: 6/2015-12/2019

Project Title: Conversion of biomass feedstock to bio-oils by microwave pyrolysis
 Name of Grantor: Creative Energy Systems
 Cooperating Faculty: **H. Lei (PI/PD)**
 Grant Amount: **\$1,567**
 Effective Dates: 10/2016-12/2019

Project Title: Service test microwave pyrolysis from a biomass feedstock
 Name of Grantor: Creative Energy Systems
 Cooperating Faculty: **H. Lei (PI/PD)**
 Grant Amount: **\$1,416**
 Effective Dates: 9/2015-9/2018

Project Title: A Differential Scanning Calorimeter for interdisciplinary research and education
 Name of Grantor: Chancellor's Equipment Grant Program
 Cooperating Faculty: A. Ameli (PI), **H. Lei**, etc.
 Grant Amount: **\$10,000**
 Effective Dates: 11/2016-12/2017

Project Title: Hydrogen saving process for cycloalkanes (naphthenes) in jet fuels from diverse Washington state forest biomasses
 Name of Grantor: Joint Center for Aerospace Technology and Innovation, Joint Industry-University Research Program
 Cooperating Faculty: **H. Lei (PI/PD)**
 Grant Amount: **\$100,218**
 Effective Dates: 7/2014-6/2015

Project Title: Acquisition of a high performance microtherm-split-tube furnace reactor integrated with micro parr reactor
 Name of Grantor: Chancellor's Equipment Grant Program
 Cooperating Faculty: **H. Lei (PI)**
 Grant Amount: **\$5,000**
 Effective Dates: 11/2014-12/2015

Project Title: Aromatic hydrocarbons for aviation biofuels from Lignocellulosic Biomass
 Name of Grantor: Joint Center for Aerospace Technology and Innovation, Joint Industry-University Research Program
 Cooperating Faculty: **H. Lei (PI/PD)**
 Grant Amount: **\$102,943.8**

Effective Dates: 7/2013-6/2014

Project Title: Advanced lithium-ion batteries incorporating bio-and nano-materials and the effects on the agricultural economy

Name of Grantor: WSU Research Advancement Challenge (RAC) Competition program

Cooperating Faculty: W.H. K. Zhong (WSU), M. G. Norton (WSU), **H. Lei**, L. Scudiero (WSU), and T. Marsh (WSU)

Grant Amount: **\$100,000**

Effective Dates: 10/2012-09/2013

Project Title: Torrefaction as biomass pretreatment for PNNL fluid-bed pyrolysis

Name of Grantor: DOE Office of Biomass Program through PNNL

Cooperating Faculty: **H. Lei (PI/PD)**

Grant Amount: **\$55,000**

Effective Dates: 11/2011-3/2013

Project Title: Torrefaction as a pretreatment method to improve biofuel quality

Name of Grantor: WSU Office of Research

Cooperating Faculty: **H. Lei (PI/PD)**

Grant Amount: **\$22,248**

Effective Dates: 05/2010-08/2012

Project Title: National Advanced Biofuels Consortium (NABC)

Name of Grantor: DOE (www.eere.energy.gov)

Cooperating Faculty: National Renewable Energy Laboratory, Pacific Northwest National Laboratory, Albemarle Corporation, Amyris Biotechnologies, Argonne National Laboratory, BP Products North America Inc., Catchlight Energy, LLC, Colorado School of Mines, Iowa State University, Los Alamos National Laboratory, Pall Corporation, RTI International, Tesoro Companies Inc., University of California, Davis, UOP, LLC, Virent Energy Systems, Washington State University (B. Ahring, **H Lei**),

Grant Amount: **\$42,273,518**

Effective Dates: 08/2010-08/2013

Role: **Co-Principal Investigator; H. Lei** project: NABC secondary processing of catalytic pyrolysis effluent

Project Title: Infrastructure: Create a more flexible, more reliable, and higher capacity U.S. energy infrastructure

Name of Grantor: DOE Laboratory Directed Research and Development Program

Cooperating Faculty: D. C. Elliott (PNNL) and **H. Lei**

Grant Amount: **\$325,000**

Effective Dates: 11/2009-10/2011

Project Title: FAA Center of Excellence for Alternative Jet Fuel and Environment

Name of Grantor: Federal Aviation Administration

Cooperating Faculty: Ralph Cavalieri, Co-led by WSU and MIT, including an additional 14 university partners and more than 50 industry and national laboratory partners throughout the United States

Grant Amount: **\$40,000,000**

Effective Dates: 12/2013-12/2023
 Role: **Team Member of WSU; H. Lei** project: Lignocellulose biomass conversion to aromatic hydrocarbons for alternative jet fuels.

Project Title: Development of microwave pyrolysis of biomass and biochar utilization
 Name of Grantor: DOE through SunGrant
 Cooperating Faculty: **H. Lei (PI/PD)** and J. Julson (SDSU)
 Grant Amount: **\$411,825**
 Effective Dates: 06/2009-06/2012

Project Title: Hydrothermal pretreatment and clean fractionation of lignocelluloses biomass for production of biobased products and fuels
 Name of Grantor: SD research and Commercialization Council
 Cooperating Faculty: **H. Lei (PI/PD)** and J. Julson (SDSU)
 Grant Amount: **\$102,000**
 Effective Dates: 07/2008-06/2012

Project Title: Development of a novel pyrolytic process for the conversion of corn biomass to biofuels and char residue
 Name of Grantor: SD research and Commercialization Council
 Cooperating Faculty: **Lei (PI/PD)**, J. Julson (SDSU), K. Muthukumarappan (SDSU), D. Raynie (SDSU), R. Gelderman (SDSU)
 Grant Amount: **\$66,000**
 Effective Dates: 7/2008-6/2010

Project Title: Development of an interactive input/output process and cost model with consideration of impacts of the end use of the biochar on the carbon status of the fuels or products made in the thermochemical conversion process
 Name of Grantor: USDA through SunGrant
 Cooperating Faculty: V. Kelley (PI, SDSU), **H. Lei**, J. Julson (SDSU), K. Muthu (SDSU), S. A. Clay (SDSU), G. Warmann (SDSU)
 Grant Amount: **\$60,000**
 Effective Dates: 7/2008-6/2010

Project Title: Biomass torrefaction and catalytic pyrolysis
 Name of Grantor: SDSU Agricultural Experimental Station
 Cooperating Faculty: **H. Lei (PI/PD)** and J. Julson (SDSU)
 Grant Amount: **\$20,000**
 Effective Dates: 10/2008-9/2010

Project Title: Development of corn ethanol process – liquefaction without alpha amylase
 Name of Grantor: Bentley and Griffith Undergraduate Research Program
 Cooperating Faculty: **H. Lei (PI)**, C. R. Keierleber (SDSU), J. Julson (SDSU)
 Grant Amount: **\$3,500**
 Effective Dates: 6/2008-12/2009

Project Title: Interactions of biochar source/properties impacts on soil properties, c sequestration potential, and crop management

Name of Grantor: DOE through SunGrant
 Cooperating Faculty: D. D. Malo (PI, SDSU), S.A. Clay (SDSU), T.E. Schumacher (SDSU), H.J. Woodard (SDSU), D.E. Clay (SDSU), and R.H. Gelderman (SDSU), **H. Lei**, and J. Julson (SDSU)

Grant Amount: **\$97,500**
 Effective Dates: 8/2008-7/2010

Project Title: Center for Biofuels Research and Development

Name of Grantor: NSF
 Cooperating Faculty: Collaborating institutions: South Dakota State U, SDSMT, Kansas State U, North Carolina State U, U New York at Stony Brook, U Hawaii

Grant Amount: **\$280,000**
 Effective Dates: 10/2008-9/2013

Project Title: Develop sustainable renewable energy systems for practical utilization of bulky biomass

Name of Grantor: DOT through SunGrant
 Cooperating Faculty: R. Ruan (PI, UMN), Schmidt (UMN), Kiittelson (UMN), P. Chen (UMN), **H. Lei**, Tiffany (UMN), D. Raynie (SDSU), W. Gibbons (SDSU), K. Muthukumarappan (SDSU), Kittelson (SDSU)

Grant Amount: **\$1,186,084**
 Effective Dates: 9/2007-8/2011

Project Title: Evaluation of ethanol production from extrusion-cooked corn starch

Name of Grantor: Buhler Group
 Cooperating Faculty: R. Ruan (PI, UMN) and **H. Lei**

Grant Amount: **\$12,000**
 Effective Dates: 1/2007-12/2007

Project Title: Extrusion scale-up and systematical analysis of screw configurations

Name of Grantor: General Mills
 Cooperating Faculty: R. Ruan (PI, UMN) and **H. Lei**

Grant Amount: **\$65,000**
 Effective Dates: 1/2006-12/2006

Project Title: Extraction, characterization and utilization of anthocyanins from red corn

Name of Grantor: French Ag Research
 Cooperating Faculty: R. Ruan (PI), P. Chen (UMN), R. Barros (UMN), F. Rigelhof (UMN), M. French (UMN), **H. Lei**

Grant Amount: **\$315,165**
 Effective Dates: 7/2004-12/2006

PROCEEDING ARTICLES (20)

Peer Reviewed Proceedings (1):

1. **H. Lei***, **S. Ren**, **J. Julson**, **L. Wang**, **Q. Bu**, and **R. Ruan**. 2011. Microwave torrefaction of corn stover and tech-economic analysis. ASME 2011 International Manufacturing Science and Engineering Conference, MSEC 2011. ISBN: 978-0-7918-4430-4, 1: 685-692.

Non Peer Reviewed Proceedings (19):

2015 Proceedings (2):

19. **L. Zhu**, **H. Lei***, **X. Zhang**, **G. Yadavalli**, **Y. Wei**, **Y. Liu**. 2015. Preparation and characterization of biochar and activated carbon based solid acid catalysts for catalytic microwave pyrolysis. 2015 ASABE Annual International Meeting, New Orleans, Louisiana, July 26 - 29, 2015
18. **X. Zhang**, **H. Lei***, **L. Zhu**, **G. Yadavalli**, **Y. Wei**, **Y. Liu**, **D. Yan**. 2015. Renewable jet fuel range alkanes from integrated catalytic processes of Douglas fir sawdust. 2015 ASABE Annual International Meeting, New Orleans, Louisiana, July 26 - 29, 2015

2014 Proceedings (3):

17. **Y. Wei**, **H. Lei***, **L. Wang**, **L. Zhu**, **X. Zhang**, **Y. Liu**. Advanced upgrading of pyrolysis bio-oil via liquid-liquid extraction and esterification by zeolite catalysis. 2014 ASABE International Meeting, Montreal, Quebec Canada July 13 – July 16, 2014. doi: 10.13031/aim.20141893057
16. **L. Zhu**, **H. Lei***, **L. Wang**, **X. Zhang**, **Y. Wei**, **Y. Liu**, **G. Yadavalli**. Characterization of surface functional groups in corn stover biochar derived from microwave-assisted pyrolysis. 2014 ASABE International Meeting, Montreal, Quebec Canada July 13 – July 16, 2014. doi: 10.13031/aim.20141893447
15. **X. Zhang**, **H. Lei***, **L. Wang**, **Y. Wei**, **L. Zhu**, **Y. Liu**, **G. Yadavalli**. Aromatic Hydrocarbons from Microwave-induced Pyrolysis of Cellulose over ZSM-5. 2014 ASABE International Meeting, Montreal, Quebec Canada July 13 – July 16, 2014. doi: 10.13031/aim.20141894632

2013 Proceedings (8):

14. **L. Wang**, **H. Lei***, **Q. Bu**, **L. Zhu**. Aromatic hydrocarbons production from catalysis of douglas fir sawdust pellets pyrolysis vapor over zeolite catalyst. 2013 AIChE Annual Meeting, San Francisco, California, November 3 – 8, 2013. <http://www3.aiche.org/proceedings/content/Annual-2013/extended-abstracts/P320497.pdf>
13. **L. Zhu**, **H. Lei***, **L. Wang**. Catalytic Microwave Pyrolysis of Douglas Fir Pellets With Carbon Catalysts Derived From Corn Stover. 2013 AIChE Annual Meeting, San Francisco, California, November 3 – 8, 2013. <http://www3.aiche.org/proceedings/content/Annual-2013/extended-abstracts/P320456.pdf>
12. **Y. Wei**, **H. Lei***. Advanced Upgrading of Pyrolysis Oil Via Liquid-Liquid Extraction. 2013 AIChE Annual Meeting, San Francisco, California, November 3 – 8, 2013. <http://www3.aiche.org/proceedings/content/Annual-2013/extended-abstracts/P316352.pdf>
11. **Q. Bu**, **H. Lei***, **L. Wang**, and **J. Tang**. Biofuel production and kinetics study of catalytic microwave pyrolysis of douglas fir pellet over activated carbon supported metal catalyst. 2013 AIChE Annual Meeting, San Francisco, California, November 3 – 8, 2013. <http://www3.aiche.org/proceedings/content/Annual-2013/extended-abstracts/P307886.pdf>
10. **L. Wang**, **H. Lei***, **Q. Bu**, **L. Zhu**, **Y. Liu**, **J. Lee**, **S. Chen**, and **J. Tang**. 2013. Catalytic upgrading of Douglas fir sawdust pellet vapors over Zn/ZSM-5 catalysts in a packed-bed catalysis reactor. American Society of Agricultural and Biological Engineers (ASABE) 2013 Annual International Meeting, 2013(3): 1869-1888. doi: <http://dx.doi.org/10.13031/aim.20131594800>
9. **Q. Bu**, **H. Lei***, **L. Wang**, and **J. Tang**. 2013. Renewable phenols and fuel production from catalytic pyrolysis of lignin using microwave irradiation heating. American Society of Agricultural and

Biological Engineers (ASABE) 2013 Annual International Meeting, 2013 (2): 1707-1740. doi: <http://dx.doi.org/10.13031/aim.20131594593>

8. L. Zhu, **H. Lei***, L. Wang, Q. Bu, Y. Wei, Y. Liu, and J. Liang. 2013. Carbon catalyst from corn stover and its application to catalytic microwave pyrolysis. American Society of Agricultural and Biological Engineers (ASABE) 2013 Annual International Meeting, 2013(3): 1854-1860. doi: <http://dx.doi.org/10.13031/aim.20131594788>
7. Y. Wei and **H. Lei***. 2013. Advanced upgrading of pyrolysis oil via liquid-liquid extraction. American Society of Agricultural and Biological Engineers (ASABE) 2013 Annual International Meeting, 2013(2): 1701-1706. doi: <http://dx.doi.org/10.13031/aim.20131594590>

2012 Proceedings (1):

6. Q. Bu, **H. Lei***, S. Ren, L. Wang, Y. Liu, J. Liang, Y. Wei, Q. Zhang, J. Tang, and R. Ruan. 2012. Phenols and fuels from catalytic microwave pyrolysis of lignocellulosic biomass. American Society of Agricultural and Biological Engineers (ASABE) 2012 Annual International Meeting, 2012(2): 1147-1162. doi: 10.13031/2013.41768

2011 Proceedings (3):

5. S. Ren, **H. Lei***, J. Julson, L. Wang, Q. Bu, and R. Ruan. 2011. Microwave torrefaction of corn stover. American Society of Agricultural and Biological Engineers (ASABE) 2011 Annual International Meeting, 2011(6): 4579-4591. doi: 10.13031/2013.37301
4. L. Wang, **H. Lei***, S. Ren, Q. Bu, J. Tang, Q. Zhang, and R. Ruan. 2011. Microwave assisted pyrolysis of Douglas fir pellets over ZSM-5 zeolite catalysts. American Society of Agricultural and Biological Engineers (ASABE) 2011 Annual International Meeting, 2011(6): 5241-5252. doi: 10.13031/2013.37342
3. S. Ren, **H. Lei***, L. Wang, Q. Bu, S. Chen, J. Wu, and R. Ruan. 2011. Microwave pyrolysis of Douglas fir sawdust pellet. American Society of Agricultural and Biological Engineers (ASABE) 2011 Annual International Meeting, 2011(2): 1334-1348. doi: 10.13031/2013.37300

2010 Proceedings (2):

2. I. Cybulska, **H. Lei***, and J. Julson. 2010. Hydrothermal pretreatment and enzymatic hydrolysis of prairie cord grass. American Society of Agricultural and Biological Engineers (ASABE) 2011 Annual International Meeting, 2011(3): 2312-2334. doi: 10.13031/2013.29737
1. I. Cybulska, **H. Lei***, and J. Julson. 2010. Integrated process of clean fractionation and hydrothermal treatment for prairie cord grass. American Society of Agricultural and Biological Engineers (ASABE) 2011 Annual International Meeting, 2011(3): 2349-2376. doi: 10.13031/2013.32003

RESEARCH MENTORSHIP AND ADVISING ACTIVITY

As Major Professor/Advisor	Research Associate	Visiting Professor	Graduated PhD	Graduated MS	Current PhD Students	Current MS Students	Under-graduate Students
Advisee Number	7	1	8	3	5	1	2
Total Advisee	26						

Supervised Postdoctoral Research Associate (4)

Yayun Zhang, PhD, Department of Biological Systems Engineering, WSU (Postdoctoral Research Associate since Oct. 2016). Postdoctoral project: Fundamental studies, modelling and computing development of biomass conversion pathways, kinetics, mechanism, and techno-economic analysis.

Zixu Yang, PhD, Department of Biological Systems Engineering, WSU (Postdoctoral Research Associate since Oct. 2016). Postdoctoral project: Fundamental studies and development of carbon based catalysts and zeolite based catalysts in catalytic processes, bio-oil upgrading, and biochar utilization for fuels and chemicals production.

Kezhen Qian, PhD, Department of Biological Systems Engineering, WSU (Postdoctoral Research Associate since Feb. 2017). Postdoctoral project: Fundamental studies and development of carbon based catalysts and zeolite based catalysts in catalytic processes, bio-oil upgrading, and biochar utilization for fuels and chemicals production.

Lu Wang, PhD, Department of Biological Systems Engineering, WSU (postdoctoral from Sep. 2013-Feb 2015); Post-doctoral project: catalysis processes for jet fuels from lignocellulosic biomass

Supervised Post-MS Research Associate (3)

Yupeng Liu, MS, Department of Biological Systems Engineering, WSU (post-MS from May. 2015-present); Post-MS project: *Lignin separation and catalytic conversion for jet fuels production*

Gayatri Yadavalli, MS, Department of Biological Systems Engineering, WSU (post-MS from Jan. 2015-present); Post-MS project: *CO₂ absorbent and Protein separation*

Di Yan, MS, Department of Biological Systems Engineering, WSU (post-MS from Jan. 2015-present); Post-MS project: *Microwave pyrolysis and activated carbon*

Supervised Visiting Scholar/Professor (1)

Xiang Shen, PhD, Associate Professor from China University of Geosciences, WSU BSEL (Visiting Professor from March 2014-March 2015); Project: catalysis conversions for lignin and sugars; Co-supervised with Dr. B. Ahring

Advised 13 PhD and 4 MS Students as Major Professor/Advisor (17) as Major Professor/Advisor for Graduated PhD Students (8)

8. Lei Zhu, **PhD**, Department of Biological Systems Engineering, WSU (Research Assistant from Aug. 2012-Nov. 2016); PhD dissertation: Development of microwave pyrolysis biochar as carbon catalyst for aviation biofuels production (Graduated Fall 2016)
7. Xuesong Zhang, **PhD**, Department of Biological Systems Engineering, WSU (Research Assistant from Jan. 2013-Aug. 2016). PhD dissertation: *Upgrading bio-oils from Douglas fir pellets pretreated by lime from packed-bed catalysis over Ni/HZSM-5 coupled with microwave-assisted pyrolysis* (Graduated Spring 2016)
6. Yi Wei, **PhD**, Department of Biological Systems Engineering, WSU (Research Assistant from Aug. 2011-Aug. 2015; Now Associate Professor at Zhejiang University of Technology); PhD dissertation: *pyrolysis oil upgrading via liquid extraction, esterification and upgrading via zsm-5* (Graduated Spring 2015)
5. Shoujie Ren, **PhD**, Department of Biological Systems Engineering, WSU (Research Assistant from Jan. 2010-Dec. 2012; Now post-doc at University of Tennessee); PhD dissertation: *Catalytic microwave torrefaction and pyrolysis of douglas fir pellet to improve biofuel quality* (Graduated Fall 2012)
4. Lu Wang, **PhD**, Department of Biological Systems Engineering, WSU (Research Assistant from Aug. 2010-Aug. 2013; Now Associate Professor at Hefei University of Technology; post-doc at

- Washington State University); PhD dissertation: *Aromatic hydrocarbons production from catalyst assisted microwave pyrolysis of Douglas fir sawdust pellet* (Graduated Summer 2013)
3. Quan Bu, **PhD**, Department of Biological Systems Engineering, WSU (Research Assistant from Aug. 2010-Aug. 2013; Now Assistant Professor at Nanjing Forestry University); PhD dissertation: *Catalytic microwave pyrolysis of biomass for renewable phenols and fuels* (Graduated Summer 2013)
 2. Rui Zhou, **PhD**, Biological and Agricultural Engineering, SDSU (Research Assistant from Jan. 2008-Aug. 2015); PhD dissertation: *Microwave pyrolysis of biomass and kinetics* (Graduated Spring 2015).
 1. Iwona Cybulska, **PhD**, Department of Agricultural and Biosystems Engineering, SDSU (Research Assistant from Oct. 2008-May 2012; Now post-doc at Masdar Institute of Science and Technology); PhD dissertation: *Pretreatment methods for lignocellulosic materials employed to produce fuel ethanol and value-added products* (Graduated Spring 2012)

as Major Professor/Advisor for Graduated MS Students (3)

3. Yupeng Liu, MS Research Assistant, Department of Biological Systems Engineering, WSU (Aug. 2011-May. 2015) MS thesis: *Torrefaction of Douglas fir pellets and catalytic upgrading of torrefaction vapors* (Graduated Spring 2015)
2. Gayatri Yadavalli, **MS**, Department of Environmental Engineering, WSU (Aug. 2013-Dec. 2014); MS thesis: *Chemical activation of biochar produced by microwave pyrolysis of biomass for use in water treatment* (Graduated Fall 2014)
1. Jing Liang, **MS**, Department of Biological Systems Engineering, WSU (Research Assistant from Aug. 2011-Aug. 2013; Now PhD student at University of California, Riverside); MS project title: *Formate-assisted microwave pyrolysis of Douglas fir pellet* (Graduated Summer 2013)

as Major Professor/Advisor for Current PhD Students (5)

5. Elmar Villota, PhD Research Assistant, Department of Biological Systems Engineering, WSU (Jan. 2015-Dec. 2017); PhD dissertation: *Development of carbon catalysts for high value chemicals and jet fuels* (in progress)
4. Marie Qian, PhD Research Assistant, Department of Biological Systems Engineering, WSU (Aug. 2015-Dec. 2018); PhD dissertation: *Lignin separation and catalytic conversion for bio jet fuels production* (in progress)
3. Charlie Shaw, PhD Research Assistant/Jan. 2014/Oct. 2016 PhD dissertation: *LCA of microwave pyrolysis of hybrid poplar for the production of biofuels and biochar* (in progress; passed PhD Preliminary Exam in Dec. 2015).
2. Xiaolu Zhu, PhD Research Assistant, Department of Biological Systems Engineering, WSU (Aug. 2015-Aug. 2016); PhD dissertation: *Protein separation and synthesis and application for bio-based battery* (in progress)
1. Jouchin Chan, PhD Research Assistant, Department of Biological Systems Engineering, WSU (Aug. 2015-Jan. 2016); PhD dissertation: *Development of activated carbon and carbon catalysts for bio jet fuels production* (in progress)

as Major Professor/Advisor for Current MS Students (1)

1. Cindy Angelia, MS Research Assistant, Department of Biological Systems Engineering, WSU (Aug. 2015-Aug. 2017) (in progress)

as Major Professor/Advisor for Undergraduate Students (2)

2. Christine Rae Keierleber, Undergraduate Research Assistant, Department of Agricultural and Bisystems Engineering, SDSU
1. Pauline Robin, Undergraduate Research Assistant, Department of Agricultural and Bisystems Engineering, SDSU

Served as Committee Chair on Ph.D. Program of Study Committees (13)

13. Elmar Villota, PhD Research Assistant, Major in Biological and Agricultural Systems Engineering, WSU (in progress)
12. Xiaolu Zhu, PhD Research Assistant, Major in Biological and Agricultural Systems Engineering, WSU (in progress)
11. Marie Qian, PhD Research Assistant, Major in Biological and Agricultural Systems Engineering, WSU (in progress)
10. Jouchin Chan, PhD Research Assistant, Major in Biological and Agricultural Systems Engineering, WSU (in progress)
9. Charlie Shaw, PhD Research Assistant, Major in Biological and Agricultural Systems Engineering, WSU (in progress)
8. Lei Zhu, PhD, Major in Biological and Agricultural Systems Engineering, WSU (Graduated fall 2016)
7. Xuesong Zhang, PhD, Major in Biological and Agricultural Systems Engineering, WSU (Graduated spring 2016)
6. Yi Wei, PhD, Major in Biological and Agricultural Systems Engineering, WSU (Graduated Spring 2015)
5. Lu Wang, PhD, Major in Biological and Agricultural Systems Engineering, WSU (Graduated Summer 2013)
4. Quan Bu, PhD, Major in Biological and Agricultural Systems Engineering, WSU (Graduated Summer 2013)
3. Shoujie Ren, PhD, Major in Biological and Agricultural Systems Engineering, WSU (Graduated Fall 2012)
2. Iwona Cybulska, PhD, Major in Biological and Agricultural Systems Engineering, SDSU (Graduated Spring 2012)
1. Rui Zhou, PhD, Major in Biological and Agricultural Systems Engineering, SDSU (Graduated Spring 2015)

Served as Committee Member on Ph.D. Program of Study Committees (4)

4. Mohammadali Azadfar, PhD Research Assistant/Aug. 2012/Aug. 2016 (Completed/Graduated Spring 2016);
3. Shuai Zhang, PhD Research Assistant/Aug. 2013/Aug. 2017 (passed PhD preliminary exam in Dec. 2015; in progress).
2. Nanditha Murali, PhD Research Assistant/Aug. 2012/Aug. 2017 (passed PhD preliminary exam in Fall 2015; in progress).
1. Na Pang, PhD Research Assistant/Jan. 2015/Dec. 2019 (in progress);

Served as Committee Chair on M.S. Program of Study Committees (4)

4. Cindy Angelia, MS Research Assistant, Department of Biological Systems Engineering, WSU (Aug. 2015-Aug. 2017) (in progress)
3. Jing Liang, MS, Major in Biological and Agricultural Systems Engineering, WSU (Graduated Summer 2013)
2. Gayatri Yadavalli, MS Research Assistant, Major in Environmental Engineering, WSU (Graduated Fall 2014)

1. Yupeng Liu, MS Research Assistant, Major in Biological and Agricultural Systems Engineering, WSU (Graduated Spring 2015)

Served as Committee Member on M.S. Program of Study Committees (2)

2. Benjamin Garrett, Major in Chemical Engineering, WSU (Graduated Spring 2014);
1. Charlie Shaw, Major in Environmental Science, WSU (Graduated Summer 2012)

COURSES TAUGHT BY SEMESTER AND INSTRUCTOR RATINGS

2016 Teaching and Advising

- **H. Lei (100% contribution).** Taught BSysE 551 Advanced Biological Systems Engineering Topics: Energy Balances & Unit Operation, 3cr, 6 students, Spring 2016.
- **H. Lei.** BSyE 800, advised 3 PhD Students, Fall 2016.
- **H. Lei.** BSyE 700, advised 1 MS student, Fall 2016.
- **H. Lei.** BSyE 800, advised 4 PhD Students, Spring 2016.
- **H. Lei.** BSyE 700, advised 1 MS student, Spring 2016.
- **H. Lei.** ENVR_SCI 800, advised 1 PhD student, Spring 2016.
- **H. Lei.** Participated in a teaching project “Biobased Energy Educational Material Exchange System” (BEEMS) led by Dr. Yebo Li at Ohio State University funded by the USDA Higher Education Challenge (HEC) Grants Program.

2015 Teaching and Advising

- **H. Lei (100% contribution).** Taught BSysE 593 Renewable Energy Technologies, 3cr, 8 students, Fall 2015. Overall Average Evaluation: 4.8 out of 5.
- **H. Lei (100% contribution).** Taught BSysE 552 Advanced Biological Systems Engineering Topics, 3cr, 5 students, Spring 2015.
- **H. Lei.** BSyE 800, advised 5 PhD Students, Fall 2015.
- **H. Lei.** BSyE 700, advised 1 MS student, Fall 2015.
- **H. Lei.** ENVR_SCI 800, advised 1 PhD student, Fall 2015.
- **H. Lei.** BSyE 800, advised 3 PhD Students, Spring 2015.
- **H. Lei.** BSyE 700, advised 1 MS student, Spring 2015.
- **H. Lei.** ENVR_SCI 800, advised 1 PhD student, Spring 2015.
- **H. Lei.** Participated in a teaching project “Biobased Energy Educational Material Exchange System” (BEEMS) led by Dr. Yebo Li at Ohio State University funded by the USDA Higher Education Challenge (HEC) Grants Program.

2014 Teaching and Advising

- **H. Lei (100% responsibility).** Taught ENVR_SCI 490/590 Biomass Conversions for Bioenergy and Bioproducts, 2cr, 5 students, Fall 2014. Overall Average Evaluation: 4.60 out of 5.
- **H. Lei (50% responsibility)** and S Sablani. Taught BSysE 598 Graduate Seminar, 1cr, 69 students, Fall 2014. Overall Average Evaluation: 3.99 out of 5.
- B. Arhing, K. Thomsen, **H. Lei** (75 minutes lecture). Guest-Lectured CHE 581 Advanced Topics in Chemical Engineering, 3 cr, 10 students, Fall 2014.
- **H. Lei.** BSyE 800, advised 3 PhD Students, Fall 2014.
- **H. Lei.** BSyE 700, advised 1 MS student, Fall 2014.
- **H. Lei.** CE 700, advised 1 MS student, Fall 2014.

- **H. Lei.** BSyE 800, advised 3 PhD Students, Spring 2014.
- **H. Lei.** BSyE 700, advised 1 MS student, Spring 2014.
- **H. Lei.** CE 700, advised 1 MS student, Spring 2014.
- **H. Lei.** Participated in a teaching project “Biobased Energy Educational Material Exchange System” (BEEMS) led by Dr. Yebo Li at Ohio State University funded by the USDA Higher Education Challenge (HEC) Grants Program.

2013 Teaching and Advising

- **H. Lei (100% responsibility).** Taught BSysE 593 Renewable Energy Technologies, 3cr, 8 students, Fall 2013. Overall Average Evaluation: 4.86 out of 5.
- **H. Lei (100% responsibility).** Taught ENVR_SCI 490/590 Biomass Conversions for Bioenergy and Bioproducts, 2cr, 6 students, Spring 2013. Overall Average Evaluation: 5 out of 5.
- B. Arhing, K. Thomsen, **H. Lei** (75 minutes lecture). Guest-Lectured CHE 581 Advanced Topics in Chemical Engineering, 3 cr, 5 students, Fall 2013.
- **H. Lei.** BSyE 800, advised 3 PhD Students, Fall 2013.
- **H. Lei.** BSyE 700, advised 2 MS students, Fall 2013.
- **H. Lei.** Participated in a teaching project “Biobased Energy Educational Material Exchange System” (BEEMS) led by Dr. Yebo Li at Ohio State University funded by the USDA Higher Education Challenge (HEC) Grants Program.
- **H. Lei.** BSyE 800, advised 5 PhD Students, Spring 2012.
- **H. Lei.** BSyE 700, advised 2 MS students, Spring 2012.

2012 Teaching and Advising

- **H. Lei (100% responsibility).** Taught BSysE 551 Advanced Biological Systems Engineering Topics, 3cr, 4 students, Fall 2012.
- **H. Lei (100% responsibility).** Taught ENVR_SCI 490/590 Biomass Conversions for Bioenergy and Bioproducts, 2cr, 8 students, Spring 2012. Overall Average Evaluation: 4.65 out of 5.
- B. Arhing, K. Thomsen, **H. Lei (10% responsibility).** Co-taught CHE 581 Advanced Topics in Chemical Engineering, 3 cr, 11 students, Fall 2012.
- **H. Lei.** BSyE 800, advised 5 PhD Students, Fall 2012.
- **H. Lei.** BSyE 700, advised 2 MS students, Fall 2012.
- **H. Lei.** Participated in a teaching project “Biobased Energy Educational Material Exchange System” (BEEMS) led by Dr. Yebo Li at Ohio State University funded by the USDA Higher Education Challenge (HEC) Grants Program.
- **H. Lei.** BSyE 800, advised 4 PhD Students, Spring 2012.
- **H. Lei.** BSyE 700, advised 2 MS students, Spring 2012.

2011 Teaching and Advising

- **H. Lei (50% responsibility)** and S Sablani. Taught BSysE 598 Graduate Seminar, 1cr, 68 students, Fall 2011. Overall Average Evaluation: 4.48 out of 5.
- **H. Lei (100% responsibility).** Taught BSysE 593 Renewable Energy Technologies, 3cr, 5 students, Fall 2011. Overall Average Evaluation: 5 out of 5.
- **H. Lei (100% responsibility).** Taught ENVR_SCI 490/590 Biomass Conversions for Bioenergy and Bioproducts, 2cr, 7 students, Spring 2011. Overall Average Evaluation: 5 out of 5.
- B. Arhing, K. Thomsen, **H. Lei (10% contribution)**, J. Holladay, S. Butner. Co- Taught ChE 581 Introduction to Biorefineries, 3 cr, 6 students, Fall 2011. Overall Avg. Evaluation: 4.80 out of 5.

- **H. Lei (100% responsibility)**. Provided one day workshop for a teacher and 10 high school students: Biomass thermochemical conversions to biofuels and bioproducts. Yakima Valley/TriCities MESA program, August 25th.
- **H. Lei**. Participated in a teaching project “Biobased Energy Educational Material Exchange System” (BEEMS) led by Dr. Yebo Li at Ohio State University funded by the USDA Higher Education Challenge (HEC) Grants Program.
- **H. Lei (100% contribution)**. Prepared course materials for BSysE 593 Renewable Energy Technologies, Spring 2011.
- **H. Lei**. BSysE 800, advised 4 PhD Students, Fall 2011.
- **H. Lei**. BSysE 700, advised 2 MS students, Fall 2011.
- **H. Lei**. BSysE 800, advised 3 PhD Students, Spring 2011.

2010 Teaching and Advising

- B. Arhing, K. Thomsen, **H. Lei (10% responsibility)**, B. Yang, X. Zhang. Co- Taught ChE 581 Introduction to Biorefineries, 3cr, 8 students, Fall 2010. Overall Average Evaluation: 4.70 out of 5.
- **H. Lei (100% responsibility)**. Provided one day workshop for a teacher and 10 students: Biomass thermochemical conversions to biofuels and bioproducts. Yakima Valley/TriCities MESA program, June 18th.
- **H. Lei**. Made one presentation at BSysE 598 graduate seminar, Fall 2011.
- **H. Lei**. BSysE 800, advised 3 PhD Students, Fall 2010.
- **H. Lei**. BSysE 800, advised 1 PhD student, Spring 2010.
- **H. Lei (100% contribution)**. Prepared course materials for ES/RP 490 and ES/RP 590, Fall 2010.
- **H. Lei**. Participated in a teaching project “Biobased Energy Educational Material Exchange System” (BEEMS) led by Dr. Yebo Li at Ohio State University funded by the USDA Higher Education Challenge (HEC) Grants Program.

2009 Teaching and Advising

- **H. Lei**. AE 800, advised 2 PhD Students, Spring 2009.
- **H. Lei**. Advised one visiting scholar, Spring 2009.

2008 Teaching and Advising

- J. Julson and **H. Lei (20% responsibility)**. Co-teaching AE 343 Physical Properties of Biological Materials. 3 cr, 20 students, Fall 2008.
- **H. Lei**. AE 800, advised 2 PhD Students, Fall 2008.
- **H. Lei**. AE 800, advised 2 PhD Students, Spring 2008.
- **H. Lei**. Advised one visiting scholar, 2008.

INTERNATIONAL CONFERENCE PRESENTATIONS (69)

2016 International Conference Papers and Presentations (5):

69. M. Qian, X. Zhang, H. Lei*, L. Zhu, J. C. Chan, X. Zhu, Y. Liu, G. Yadavalli, D. Yan. 2016. Catalytic separation and depolymerization of lignin for effective production of aromatic hydrocarbons. 2016 ASABE Annual International Meeting, Orlando, Florida, July 17 - 20, 2016

68. L. Zhu, H. Lei*, X. Zhang, Y. Liu, G. Yadavalli, D Yan, M. Qian, X. Zhu, J. C. Chan. 2016. Hydrocarbon Fuels Produced by Microwave-assisted Pyrolysis of Low Density Polyethylene (LDPE) over Carbon Catalysts. 2016 ASABE Annual International Meeting, Orlando, Florida, July 17 - 20, 2016
67. X. Zhu, G. Yadavalli, H. Lei*, X. Zhang, M. Qian, J. C. Chan, L. Zhu, Y. Liu, , D Yan. Protein based solid electrolyte from abundant Canola meal protein. 2016 ASABE Annual International Meeting, Orlando, Florida, July 17 - 20, 2016
66. H. Lei*. 2016. Aromatics and Cycloalkanes/Naphthenes for Jet Fuels from Lignocellulosic Biomass. 2016 International Symposium on Energy Economics and Management, Beijing, July 5-10

2015 International Conference Presentations (2):

65. X. Zhang, H. Lei*, L. Zhu, G. Yadavalli, Y. Wei, Y. Liu, D. Yan. 2015. Renewable jet fuel range alkanes from integrated catalytic processes of Douglas fir sawdust. 2015 ASABE Annual International Meeting, New Orleans, Louisiana, July 26 - 29, 2015
64. L. Zhu, H. Lei*, X. Zhang, G. Yadavalli, Y. Wei, Y. Liu. 2015. Preparation and characterization of biochar and activated carbon based solid acid catalysts for catalytic microwave pyrolysis. 2015 ASABE Annual International Meeting, New Orleans, Louisiana, July 26 - 29, 2015

2014 International Conference Presentations (4):

63. Y. Wei, H. Lei*, L. Wang, L. Zhu, X. Zhang, Y. Liu. Advanced upgrading of pyrolysis bio-oil via liquid-liquid extraction and esterification by zeolite catalysis. 2014 ASABE International Meeting, Montreal, Quebec Canada July 13 – July 16, 2014
62. L. Zhu, H. Lei*, L. Wang, X. Zhang, Y. Wei, Y. Liu, G. Yadavalli. Characterization of surface functional groups in corn stover biochar derived from microwave-assisted pyrolysis. 2014 ASABE International Meeting, Montreal, Quebec Canada July 13 – July 16, 2014
61. X. Zhang, H. Lei*, L. Wang, Y. Wei, L. Zhu, Y. Liu, G. Yadavalli. Upgraded bio-oil from packed-bed catalysis over Ni/HZSM-5 with the addition of ethanol vapor coupled with microwave pyrolysis of Douglas fir pellets. 2014 ASABE International Meeting, Montreal, Quebec Canada July 13 – July 16, 2014
60. L. Wang, H. Lei*, Q. Bu, S. Ren, Y. Wei, L. Zhu, X. Zhang, Y. Liu, G. Yadavalli. Comparison of aromatic hydrocarbon production and distribution between in-situ and ex-situ catalytic pyrolysis of wood sawdust. 2014 ASABE International Meeting, Montreal, Quebec Canada July 13 – July 16, 2014

2013 International Conference Presentations (10):

59. S. Ren, H. Lei*, S. Chen, and J. Wu. Biomass and torrefied biomass catalytic pyrolysis and bio-oil upgrading over a biomass derived carbon catalyst. 2013 International Conference on the Thermochemical Conversion Science, Chicago, IL, 3-6 September 2013
58. L. Wang, H. Lei*, S. Ren, Q. Bu, J. Liang, Y. Wei, Y. Liu, J. Tang. Aromatic hydrocarbons production from catalysis of douglas fir sawdust pellets pyrolysis vapor over zeolite catalyst. 2013 AIChE Annual Meeting, San Francisco, California, November 3 – 8, 2013
57. L. Zhu, H. Lei*, L. Wang, Q. Bu, J. Liang, Y. Wei, Y. Liu. Catalytic Microwave Pyrolysis of Douglas Fir Pellets With Carbon Catalysts Derived From Corn Stover. 2013 AIChE Annual Meeting, San Francisco, California, November 3 – 8, 2013
56. Y. Wei, H. Lei*, Q. Bu, J. Liang, Y. Liu, S. Ren, L. Wang. Advanced Upgrading of Pyrolysis Oil Via Liquid-Liquid Extraction. 2013 AIChE Annual Meeting, San Francisco, California, November 3 – 8, 2013

55. Q. Bu, **H. Lei***, L. Wang, and J. Tang. Biofuel production and kinetics study of catalytic microwave pyrolysis of douglas fir pellet over activated carbon supported metal catalyst. 2013 AIChE Annual Meeting, San Francisco, California, November 3 – 8, 2013
54. Q. Bu, **H. Lei***, S. Ren, L. Wang, Y. Liu, J. Liang, Y. Wei, Q. Zhang, J. Tang. Renewable phenols and fuel production from catalytic pyrolysis of lignin using microwave irradiation heating. 2013 ASABE International Meeting, Kansas City, Missouri, July 21-24, 2013
53. S. Ren, **H. Lei***, L. Wang, Q. Bu, Y. Liu, J. Liang, Y. Wei, S. Chen, J. Wu. Thermal behavior and kinetic study for woody torrefied biomass pyrolysis by TGA. 2013 ASABE International Meeting, Kansas City, Missouri, July 21-24, 2013
52. L. Wang, **H. Lei***, Q. Bu, L. Zhu, Y. Liu, J. Lee, S. Chen, J. Tang. Catalytic upgrading of Douglas fir sawdust pellet vapors over Zn/ZSM-5 catalysts in a packed-bed catalysis reactor. 2013 ASABE International Meeting, Kansas City, Missouri, July 21-24, 2013
51. L. Zhu, **H. Lei***, L. Wang, Q. Bu, J. Liang, Y. Wei, Y. Liu. Carbon catalysts from Corn Stover and its Application to Catalytic Microwave Pyrolysis. 2013 ASABE International Meeting, Kansas City, Missouri, July 21-24, 2013
50. Y. Wei, **H. Lei***, Q. Bu, J. Liang, Y. Liu, S. Ren, L. Wang. Advanced analysis of products from organosolv lignin by microwave pyrolysis. 2013 ASABE International Meeting, Kansas City, Missouri, July 21-24, 2013

2012 International Conference Presentations (8):

49. S. Ren, **H. Lei***, L. Wang, Q. Bu, Y. Liu, J. Liang, Y. Wei, S. Chen, J. Wu, and R. Ruan. Furfural production from microwave catalytic torrefaction of Douglas fir sawdust pellets. 2012 AIChE Annual Meeting, Pittsburgh, PA in Oct.-Nov. 2012
48. J. Liang, **H. Lei***, Y. Liu, Y. Wei, L. Wang, Q. Bu, S. Ren, J. Tang, Q. Zhang. A review on renewable hydrogen generation by reforming of glycerol. 2012 ASABE International Meeting, Dallas, Texas, July 29-Aug 1, 2012
47. Y. Wei, **H. Lei***, Q. Bu, J. Liang, Y. Liu, S. Ren, L. Wang, J. Tang, Q. Zhang. Renewable hydrocarbons produced from glucose by aqueous-phase reforming process. 2012 ASABE International Meeting, Dallas, Texas, July 29-Aug 1, 2012
46. Y. Liu, **H. Lei***, S. Ren, A. Zacher, Q. Bu, J. Liang, Y. Wei, L. Wang, Q. Zhang, J. Tang. Biomass torrefaction and bio-oil upgrading over HZSM-5. 2012 ASABE International Meeting, Dallas, Texas, July 29-Aug 1, 2012
45. S. Ren, **H. Lei***, L. Wang, Q. Bu, Y. Liu, J. Liang, Y. Wei, S. Chen, J. Wu, and R. Ruan. Optimum conditions and characteristics of products from microwave torrefaction of Douglas fir sawdust pellet. 2012 ASABE International Meeting, Dallas, Texas, July 29-Aug 1, 2012
44. S. Ren, **H. Lei***, A. Zacher, Y. Liu, L. Wang, Q. Bu, J. Liang, Y. Wei, S. Chen, J. Wu. High quality biofuel production from torrefied biomass. 2012 ASABE International Meeting, Dallas, Texas, July 29-Aug 1, 2012
43. Q. Bu, **H. Lei***, S. Ren, L. Wang, Y. Liu, J. Liang, Y. Wei, Q. Zhang, J. Tang, and R. Ruan. Phenols and fuels from catalytic microwave pyrolysis of lignocellulosic biomass. 2012 ASABE International Meeting, Dallas, Texas, July 29-Aug 1, 2012
42. L. Wang, **H. Lei***, S. Ren, Q. Bu, J. Liang, Y. Wei, Y. Liu, J. Tang, Q. Zhang, and R. Ruan. Aromatic hydrocarbons from catalytic conversion of microwave assisted pyrolysis of pine wood over ZSM-5 Zeolite. 2012 ASABE International Meeting, Dallas, Texas, July 29-Aug 1, 2012

2011 International Conference Presentations (5):

41. S. Ren, **H. Lei***, J. Julson, L. Wang, Q. Bu. 2011. The effects of reaction temperature and time on microwave torrefaction of corn stover. 2011 ASABE International Meeting, Louisville, Kentucky, Aug 7-10, 2011
40. S. Ren, **H. Lei***, J. Julson, L. Wang, Q. Bu. 2011. Microwave pyrolysis of douglas fir sawdust pellet. 2011 ASABE International Meeting, Louisville, Kentucky, Aug 7-10, 2011
39. L. Wang, **H. Lei***, S. Ren, Q. Bu. 2011. Microwave assisted pyrolysis of Douglas fir over ZSM-5 Zeolite catalysts. 2011 ASABE International Meeting, Louisville, Kentucky, Aug 7-10, 2011
38. Q. Bu, **H. Lei***, S. Ren, and L. Wang. 2011. Biofuel production from one-step conversion using formic acid-alcohol as reaction medium. 2011 ASABE International Meeting, Louisville, Kentucky, Aug 7-10, 2011
37. R. Ruan*, P. Chen, J. Zhou, M. Min, Y. Cheng, M. Mohr, Y. Li, B. Hu, X. Ma, L. Li, Y. Zhao, Z. Du, X. Wang, Y. Li, S. Deng, **H. Lei**, X. Lin, Y. Liu, Y. Wan, B. Martinez. 2011. Mass culture of algae for biofuel production and wastewater treatment in northern climates. 4th Congress of the International Society for Applied Phycology, Halifax, Canada

2010 International Conference Presentations (5):

36. R. Zhou, **H. Lei***, J. Julson. 2010. Fast Pyrolysis Optimization of Corn Stover, Switch Grass and Prairie Cordgrass for the Production of Bio-Oil and Volatiles. Paper # 1009439. 2010 ASABE Annual International Meeting, Pittsburgh, Pennsylvania, June 20- 23, 2010
35. **H. Lei***, S. Ren, J. Julson. 2010. Microwave Torrefaction of Corn Stover, Paper # 1009448. 2010 ASABE Annual International Meeting, Pittsburgh, Pennsylvania, June 20- 23, 2010
34. **H. Lei***, R. Zhou, and J. Julson. 2010. Comparison of Productions from the Pyrolysis of Three Biomasses: Corn Stover, Switch Grass and Prairie Cordgrass. paper# 1009834. 2010 ASABE Annual International Meeting, Pittsburgh, Pennsylvania, June 20- 23, 2010
33. I. Cybulska, **H. Lei***, J. Julson. 2010. Optimization of Clean Fractionation as a Biomass Pretreatment Method. paper# 1008847. 2010 ASABE Annual International Meeting, Pittsburgh, Pennsylvania, June 20- 23, 2010
32. I. Cybulska, **H. Lei***, J. Julson. 2010. Hydrothermal Pretreatment and Enzymatic Hydrolysis of Prairie Cord Grass. paper# 1008844. 2010 ASABE Annual International Meeting, Pittsburgh, Pennsylvania, June 20- 23, 2010

2009 International Conference Presentations (2):

31. **H. Lei***, S. Ren, R. Zhou, and J. Julson. Particle size of corn stover on pyrolysis. 2009 ASABE Annual International Meeting, Reno, Nevada, June 21-24
30. **H. Lei***, S. Ren, R. Zhou, and J. Julson. Optimization of pyrolysis conditions for the production of biooil and biogas from corn distiller's dried grains with solubles (DDGS). 2009 ASABE Annual International Meeting, Reno, Nevada, June 21-24

2008 International Conference Presentations (7):

29. **H. Lei***, K. Hennessey, Y. Liu, X. Lin, Y. Wan and R. Ruan. Optimization of hydrothermal pretreatment of corn stover. 2008 ASABE Annual International Meeting, Providence, Rhode Island, June 29- July 2, 2008
28. **H. Lei***, K. Petrofsky, A. Hohn, X. Cao, P. Chen, R. Ruan. Microscopic Examination of Structural Changes in Wheat bran due to Pulverization and Enzymatic Hydrolysis. 2008 ASABE Annual International Meeting, Providence, Rhode Island, June 29- July 2, 2008

27. C. Yang, J. Moen, B. Zhang, K. Hennessy, **H. Lei**, Y. Liu, P. Chen and R. Ruan*. 2008. Fractionation and characterization of bio-oil from biomass pyrolysis. 30th Symposium on Biotechnology for Fuels and Chemicals, New Orleans, LA
26. J. Moen, B. Zhang, C. Yang, Z. Le, K. Hennessy, **H. Lei**, Y. Liu, P. Chen and R. Ruan*. 2008. Catalytic Microwave-Assisted Pyrolysis of High-diversity Grassland Perennials. 30th Symposium on Biotechnology for Fuels and Chemicals, New Orleans, LA
25. K. Hennessy, B. Zhang, C. Yang, **H. Lei**, Y. Liu, P. Chen and R. Ruan*. 2008. A continuous plug-flow system for hydrothermal processing of aqueous biomass. 30th Symposium on Biotechnology for Fuels and Chemicals, New Orleans, LA
24. R. Ruan, K. Petrofsky, **H. Lei***, A. Hohn, P. Chen, L. Marquart. 2008. High-pressure homogenization and enzymatic treatment of bran. IFT Symposium: Designing and delivering whole grains with enhanced health attributes. 2008 IFT Annual Meeting, New Orleans, Louisiana, June 28, 2008 - July 2, 2008
23. R. Ruan*, Y. Li, X. Lin, X. Ye, **H. Lei**, P. Chen. 2008. Magnetic resonance imaging of foods. IFT Symposium: Water in Foods. 2008 IFT Annual Meeting, New Orleans, Louisiana, June 28, 2008 - July 2, 2008

2007 International Conference Presentations (3):

22. **H. Lei***, R. G. Fulcher, R. Ruan, B. van Lengerich. 2007. Prediction of water solubility index of rice extrudates from a co-rotating twin-screw extruder. 2007 ASABE Annual International Meeting, Minneapolis, Minnesota, June 17-20, 2007
21. **H. Lei***, R. G. Fulcher, R. Ruan, B. van Lengerich. 2007. Changes in CIElab color parameters in twin-screw extruded rice-glucose-lysine blend. 2007 ASABE Annual International Meeting, Minneapolis, Minnesota, June 17-20, 2007
20. **H. Lei***, R. G. Fulcher, R. Ruan, B. van Lengerich. 2007. Color development in an extrusion-cooked model system. 2007 IFT Annual Meeting. Chicago, Illinois. July 27-August 1, 2007

2006 International Conference Presentations (3):

19. **H. Lei***, R. G. Fulcher, R. Ruan, B. van Lengerich. 2006. Assessment of color development due to twin-screw extrusion of rice-glucose-lysine blend using computer vision. Paper No. 066100. 2006 ASABE Annual International Meeting, Portland, Oregon, July 9 - 12, 2006
18. **H. Lei***, R. G. Fulcher, R. Ruan, B. van Lengerich. 2006. Reaction kinetics of color development in an extrusion-cooked model system. Paper No. 066113. 2006 ASABE Annual International Meeting, Portland, Oregon, July 9 - 12, 2006
17. R. Ruan*, S. Deng, X. Lin, **H. Lei**, P. Chen. 2006. Non-thermal plasma disinfection of foods. In Symposium: "Nonthermal Processing: Food Quality and Chemistry", 2006 American Chemical Society (ACS) Annual Meeting, Atlanta, Georgia, March 26-30, 2006

2005 International Conference Presentations (5):

16. **H. Lei***, G. Fulcher, R. Ruan, and B. van Lengerich. 2005. Mean residence time analysis for a co-rotating twin-screw extruder. Paper No. 31050. 2005 IFT Annual Meeting, New Orleans, Louisiana, July 15-20, 2005
15. **H. Lei***, G. Fulcher, R. Ruan, and B. van Lengerich. 2005. Modeling extrusion system parameters in a co-rotating twin-screw extruder. Paper No. 31005. 2005 IFT Annual Meeting, New Orleans, Louisiana, July 15-20, 2005

14. **H. Lei***, G. Fulcher, R. Ruan, and B. van Lengerich. 2005. Residence time distribution and mean residence time in a co-rotating twin-screw extruder. Paper No. 056112. 2005 ASAE Annual International Meeting, Tampa, Florida, July 17-20, 2005
13. **H. Lei***, G. Fulcher, R. Ruan, and B. van Lengerich. 2005. Modeling die Pressure, die temperature, shaft torque, and SME in a co-rotating twin-screw extruder. Paper No. 056113. 2005 ASAE Annual International Meeting, Tampa, Florida, July 17-20, 2005
12. **H. Lei***, G. Fulcher, R. Ruan, and B. van Lengerich. 2005. Prediction of water solubility index of rice extrudate in a co-rotating twin-screw extruder. 2005 International Conference of Cereal Science and Technology, Veyna, Austria, June 29-July 1, 2005

2004 International Conference Presentations (2):

11. **H. Lei***, G. Fulcher, R. Ruan, and B. van Lengerich. 2004. Twin screw extrusion of rice flour-effects of extrusion processing conditions on extrudate characteristics. Paper No. 25837. 2004 IFT Annual Meeting, Las Vegas, Nevada, July 12-16, 2004
10. **H. Lei***, G. Fulcher, R. Ruan, and B. van Lengerich. 2004. Influence of processing on the extrudate characteristics of rice flour. Paper No. 046013. 2004 ASAE Annual International Meeting, Ottawa, Canada, August 1-4, 2004

2003 International Conference Presentations (3):

9. **H. Lei***, G. Fulcher, R. Ruan, and K. Schmitz. 2003. Effects of processing conditions on cereal fibers by twin screw extrusion. Paper No. 036072. 2003 ASAE Annual international Meeting, Las Vegas, Nevada, July 27-30, 2003
8. **H. Lei***, G. Fulcher, R. Ruan, and K. Schmitz. 2003. Effects of processing conditions on wheat bran by twin screw extrusion. Paper No. 20066. 2003 IFT Annual Meeting, Chicago, Illinois, July 12-16, 2003
7. **H. Lei***, R. Ruan, P. Chen, S. Deng, X. Lin, G. Fulcher, W. F. Wilcke. 2003. Ozonation steeping in corn wet milling process. Paper No. 20132. 2003 IFT Annual Meeting, Chicago, Illinois, July 12-16, 2003

2002 and Before International Conference Presentations (6):

6. R. Ruan, **H. Lei***, P. Chen, S. Deng. 2002. Study on ozone-aided corn steeping processing. Paper No. 036072. 2002 ASAE Annual International Meeting/CIGR World Congress, Chicago, Illinois, July 29 - August 1, 2002
5. X. Pan, R. Ruan*, **H. Lei**, X. Lin, Y. Liu, P. Chen, V. Morey, T. Yang. 2002. Preparation of polyurethane and polyester from liquefied starch. 2002 ASAE Annual International Meeting, Chicago, Illinois, July 29 - August 1, 2002
4. H. Ma, R. Ruan*, P. Chen, **H. Lei**. 2002. A study of a new ozone generator induced by pulse streamer corona discharge plasma. 2002 ASAE Annual International Meeting, Chicago, Illinois, July 29 - August 1, 2002
3. **H. Lei***. 1998. A study of improving production quality of the ready-to-serve rice. In 1998 Chinese National Agricultural Product Drying and Storing Machinery Symposium, Kunming, China
2. **H. Lei***. 1996. Probe into wheat starch and husk powder producing technology. In 1996 Chinese National Agricultural Product Drying and Storing Machinery New Technology Development Symposium, Jinan, China
1. **H. Lei***. 1994. The nutrition value of wheat ectoderm and its extraction method. In 1994 Chinese National Agricultural Products Drying and Processing Technology and Machinery Symposium, Chengdu, China

International Webinar (2):

2. **H. Lei (Coordinator and Lead Speaker)**, C. Liang. 2015. AOC Webinar -- Agricultural, Biological, and Food Engineers' professional development – Shining Resume-Make your Resume a Sales and Marketing Document. Association of Overseas Chinese Agricultural, Biological, and Food Engineers (AOCABFE): reach out students, teach, lead, and connect these potential future leaders for their professional development. April 2015.
1. **H. Lei (Coordinator and Lead Speaker)**, F. Yu, J. Wei, P. Li. 2014. AOC Webinar -- Job Search: Finding a Job in Academia or Industry? Association of Overseas Chinese Agricultural, Biological, and Food Engineers (AOCABFE): reach out students, teach, lead, and connect these potential future leaders for their professional development. March 2014.

PATENTS AND INVENTION DISCLOSURE (17)**2016 Patents and Invention Disclosures (1)**

17. **H. Lei, X Zhang**. "From intact biomass to renewable cycloalkanes for jet fuels". USPTO 62385841, September 2016

2015 Patents and Invention Disclosures (3)

16. **H. Lei, G. Yadavalli**. "Carbon dioxide capture using ammonium sulfate surface modified activated biomass carbon". Date Filed: July 2015 **(1,2,3,4,5,6)**
15. **H. Lei, X Zhang**. "From intact biomass to renewable cycloalkanes for jet fuels". Date filed: July 2015 **(1,2,3,4,5,6)**
14. **H. Lei and L. Wang**. "Aromatic hydrocarbons from lignocellulose biomass". USPTO 27158.8047.US01, February 2015 **(1,2,3,4,5,6)**

2014 Patents and Invention Disclosures

13. **H. Lei**. "Fuels, chemicals, and hydrogen-rich syngas production from microwave assisted carbon catalysis of lignocellulosic biomass". Date filed: April 2014 **(1,2,3,4,5,6)**
12. **H. Lei and L. Wang**. "Aromatic hydrocarbons from lignocellulose biomass". USPTO 61938416, February 2014 **(1,2,3,4,5,6)**

2012 Patents and Invention Disclosures

11. **H. Lei and L. Wang**. "Aromatic hydrocarbons from lignocellulose biomass". Date filed: November 2012 **(1,2,3,4,5,6)**

2011 Patents and Invention Disclosures

10. **H. Lei, Q. Bu, S. Ren, and L. Wang**. "Microwave Assisted Pyrolysis and Phenol Recovery". USPTO 61483132, May 2011 **(1,2,3,4,5,6)**
9. **H. Lei, Q. Bu, S. Ren, and L. Wang**. "Methods and Synthesis of Phenol and Phenolics from Lignocellulose Biomass and Related Biomass Derived Phenol-formaldehyde (PF) Resin / Polyurethane (PU) Foam and Hydrocarbon Biofuels". Date filed: January 2011 **(1,2,3,4,5,6)**

2010 Patents and Invention Disclosures

8. **H. Lei and S. Ren**. "Catalytic microwave torrefaction/pyrolysis of biomass for biofuels and bioproducts". Date filed: October 2010 **(1,2,3,4,5,6)**

7. **H. Lei**. "Feedstock-flexible plasma gasification system for biofuels and bioproducts". Date filed: July, 2010 **(1,2,3,4,5,6)**
6. **H. Lei** and **S. Ren**. "Method and apparatus for biomass torrefaction and pyrolysis". USPTO 61404560, March 2010 **(1,2,3,4,5,6)**

2009 Patents and Invention Disclosures

5. **H. Lei** and **S. Ren**. "Novel catalyst and catalytic microwave pyrolysis for high quality biofuels and chemicals production with zero total acid number and enhanced aromatic compounds". Date filed: May 2009 **(1,2,3,4,5,6)**
4. **H. Lei** and **S. Ren**. "Method and apparatus for biomass torrefaction and pyrolysis for biofuels and chemicals production". USPTO 61278157, 2009 **(1,2,3,4,5,6)**
3. **H. Lei**, J. Julson, and **I. Cybulska**. "Method of fractionating lignocellulosic material into lignin, cellulose and dissolved sugars with enhanced delignification and cellulose digestibility". Date filed: 2009. **(1,2,3,4,5,6)**

2008 Patents and Invention Disclosures

2. **H. Lei**, J. Julson, and **C. Keierleber**. "Process for producing corn ethanol - liquefaction and saccharification without alpha amylase and glucoamylase enzymes". Date filed: 2008 **(1,2,3,4,5,6)**

2007 Patents and Invention Disclosures

1. R. Ruan, X. Pan, P. Chen, and **H. Lei**. "A novel process for producing biopolymers from agricultural crop residuals". Date filed: 2007 **(1,3,4,5,6)**

HONORS AND AWARDS

2016 Honors and Awards

29. Won "**Highly Cited Research**" from *Biosystems Engineering*. "Thermal behaviour and kinetic study for woody biomass torrefaction and torrefied biomass pyrolysis by TGA". The internationally respected *Biosystems Engineering* (formerly JAER) is the official scientific journal of The European Society of Agricultural Engineers (EurAgEng).
28. **Dr. Hanwu Lei's research featured in a top journal:** The August 2016 issue of the journal of Green Chemistry features the research article from Dr. Lei's group, "Catalytic co-pyrolysis of lignocellulosic biomass with polymers: a critical review." (Front cover based on a design by Drs. Xuesong Zhang and Hanwu Lei; Dr. Xuesong Zhang is the recent PhD graduate from Dr. Lei's group). Green Chemistry is a top journal (Impact Factor: 8.506) and the frontiers of the interdisciplinary science of alternative sustainable technologies and publishes cutting-edge research.
27. Listed in **Who's Who in America**, 70th Edition (2016)
26. Listed as "**2016 Top 20 Articles**" published on the same topic at BioMedLib: Bu Q, Lei H, Wang L, Wei Y, Zhu L, Zhang X, Liu Y, Yadavalli G, Tang J. Bio-based phenols and fuel production from catalytic microwave pyrolysis of lignin by activated carbons. *Bioresour Technol.* 162:142-7.

2015 Honors and Awards

25. "**Best Paper Award 2015**" from *Bioresource Technology*. The published paper "A review of catalytic hydrodeoxygenation of lignin-derived phenols from biomass pyrolysis" appears among the ten top cited papers contributing to the *Bioresource Technology* 2014 Impact Factor. Dr.

Hanwu Lei and his co-authors are contributing such high quality work to the journal, and helping to secure *Bioresource Technology's* continued position as a high impact journal in its field of biomass, biological waste treatment, and bioenergy.

24. **“Outstanding Services”**, Association of Overseas Chinese Agricultural, Biological, and Food Engineers (AOCABFE) extends its sincere appreciation in recognition of outstanding services to Dr. Hanwu Lei at the 2015 Annual Meeting of ASABE, New Orleans, LA, July 2015.
23. Listed as **“2015 Top 20 Articles”** published on the same topic at BioMedLib: **H. Lei***, S. Ren, L. Wang, Q. Bu, J. Julson, J. Holladay, and R. Ruan. Microwave pyrolysis of distillers dried grain with solubles (DDGS) for biofuel production. *Bioresource Technology*, 102 (10) 6208–6213.
22. 2015 CleanTech ShowCase Travel Grant Award of \$500, WSU Offices of Research, Economic development, And Commercialization, June 2015
21. Listed in **Who's Who in Science and Engineering**, 12th Edition (2016-2017)
20. Listed in **Who's Who in America**, 69th Edition (2015)
19. **Elsevier Reviewer Recognition, Certificate of Reviewing**, Elsevier, Amsterdam, The Netherlands, 2015

2014 Honors and Awards

18. **Early Career Award**, Association of Overseas Chinese Agricultural, Biological, and Food Engineers (AOCABFE), July 2014. The purpose of this award is to recognize outstanding career achievement by a young AOC member in the profession of Agricultural, Biological and Food Engineering. The award is to honor achievement through education, research, innovation, development, extension, consulting, administration, international collaboration, and other professional activities.
17. Listed as **“2014 Top 20 Articles”** published on the same topic at BioMedLib: **H. Lei***, S. Ren, L. Wang, Q. Bu, J. Julson, J. Holladay, and R. Ruan. Microwave pyrolysis of distillers dried grain with solubles (DDGS) for biofuel production. *Bioresource Technology*, 102 (10) 6208–6213.
16. Listed in *Who's Who in America*, 68th Edition (2014)

2013 Honors and Awards

15. Listed as **“2013 Top 20 Articles”** published on the same topic at BioMedLib: #1. **H. Lei***, S. Ren, L. Wang, Q. Bu, J. Julson, J. Holladay, R. Ruan. Microwave pyrolysis of distillers dried grain with solubles (DDGS) for biofuel production. *Bioresour Technol.*, 102 (10):6208-13; #16. Q. Bu Q, **H. Lei***, S. Ren, L. Wang, Q. Zhang, J. Tang, R. Ruan. Production of phenols and biofuels by catalytic microwave pyrolysis of lignocellulosic biomass. *Bioresour Technol.*, 108: 274-9.
14. Listed in *Who's Who in America*, 67th Edition (2013)

2012 Honors and Awards

13. **“Certificate of Appreciation”** for valuable contribution and dedicated service in the peer review of manuscripts submitted to ACS journals, Journals Publishing Group, American Chemical Society, 2012
12. **“Guest of Honor”** in 2012 American Chemical Society Annual Meeting of Author & Reviewer Reception, San Diego, CA, March 2012.
11. Listed as **“2012 Most Downloaded Articles”** in *J. Analytic and Applied Pyrolysis*: S. Ren, **H. Lei***, L. Wang, Q. Bu, S. Chen, J. Wu, J. Julson, and R. Ruan. 2012. Biofuel production and kinetics analysis of microwave pyrolysis for Douglas fir sawdust pellet. *J. Analytic and Applied Pyrolysis*. 94: 163-169.
10. Listed in *Who's Who in Science and Engineering*, 11th Edition (2011-2012)

2009 and before Honors and Awards

9. **Orville and Enolia Bentley Research Award**, C. R. Keierleber, **H. Lei***, J. Julson. 2009. Development of corn ethanol process – liquefaction without alpha amylase
8. **Third Place Award** of "Modeling die pressure, shaft torque, SME, and product temperature in a co-rotating twin-screw extruder". Paper No. 056113. AOC Paper Competition of ASABE Annual International Meeting, Tampa, Florida, 2005
7. "A Future Leader in Agricultural Engineering", International Commission of Agricultural Engineering, XV CIGR World Congress, Chicago, 2002
6. **First Place Paper Award** of "A study of improving producing quality of the ready-to-serve rice" at Chinese National Agricultural Product Drying and Storing Machinery New Technology Development Symposium, Kunming, 1998
5. **First Place Paper Award** of "The nutrition value of wheat ectoderm and its extraction method" at Chinese National Agricultural Product Drying and Storing Machinery New Technology Development Symposium, Chengdu, 1994
4. Excellent Graduate Dissertation, Wuxi University of Light Industry, China, 1992
3. Excellent Student Leading Cadre of Institute, Wuxi University of Light Industry, China, 1990
2. The First Scholarship of Institute, Wuxi University of Light Industry, China, 1990
1. The Second Scholarship of Institute, Wuxi University of Light Industry, China, 1989

MY STUDENTS' ACHIEVEMENTS/AWARDS**2016 My Students' Achievements/Awards (1)**

19. PhD student Lei Zhu (Aug. 2012-Nov. 2016), under the supervision of Dr. **H. Lei**, **won scholarship for Summer School on Sustainable Chemistry for Sustainable Development**. Lei Zhu was one of the 15 scholarship recipients from around the world, and the only one selected from the United States, to attend the 2nd Summer School on Sustainable Chemistry for Sustainable Development in Germany.

2015 My Students' Achievements/Awards (5)

18. **Graduate Studies Achievement Award**: PhD student Xuesong Zhang (Aug. 2012-Aug. 2016), under the supervision of Dr. **H. Lei**, won 2015-2016 WSU BSYSE Outstanding Graduate Student Award - Alfred and Genevieve Gallucci Scholarship of \$500, November 2015.
17. **Graduate Studies Achievement Award**: PhD student Lei Zhu (Aug. 2012-Aug. 2016), under the supervision of Dr. **H. Lei**, won 2015-2016 WSU BSYSE Outstanding Graduate Student Award - Alfred and Genevieve Gallucci Scholarship of \$500, November 2015.
16. **"ACS Summer Program"**: Lei Zhu, a doctoral student under the guidance of Dr. **H. Lei**, was selected for American Chemical Society Summer School on Green Chemistry and Sustainable Energy. Lei Zhu, is one of 33 United States-based students to be selected for the June 17-24 American Chemical Society Summer School on Green Chemistry and Sustainable Energy, to explore scientific solutions to the global challenges of sustainable energy through presentations by leading researchers, collaborative projects and discussions. The ACS summer program was open to graduate students and postdoctoral scholars in the United States, Canada and Latin America. Sixty students attended the program in 2015.
15. **China Scholarship Council (CSC) Scholarship**: PhD student Xiaolu Zhu (Aug. 2015-Aug. 2019), under the supervision of Dr. **H. Lei**, won China Scholarship Council (CSC) Scholarship (\$1300 per month for 4 years), May 2015.

14. **Graduate Leadership and Service Award:** PhD student Lei Zhu, under the supervision of Dr. **H. Lei**, won 2015 Graduate Leadership and Service Award from the Association of Overseas Chinese Agricultural, Biological and Food Engineers.

2014 My Students' Achievements/Awards (4)

13. **Graduate Studies Achievement Award:** PhD student Lei Zhu (Aug. 2012-Aug. 2016), under the supervision of Dr. **H. Lei**, won 2014 WSU BSYSE Outstanding Graduate Student Award - Alfred and Genevieve Gallucci Scholarship of \$500, May 2014.
12. **Travel Award:** PhD student **Yi Wei**, under the supervision of Dr. **H. Lei**, won a travel award of about \$2,858 from WSU Department of Biological Systems Engineering to attend the 2014 American Society of Agricultural and Biological Engineers (ASABE) International Conference to be held at Montreal, QC Canada in July 2014. Yi will make an oral presentation titled "Advanced upgrading of pyrolysis bio-oil via liquid-liquid extraction and esterification by zeolite catalysis" at the conference.
11. **Travel Award:** PhD student **Xuesong Zhang**, under the supervision of Dr. **H. Lei**, won a travel award of about \$2,858 from WSU Department of Biological Systems Engineering to attend the 2014 American Society of Agricultural and Biological Engineers (ASABE) International Conference to be held at Montreal, QC Canada in July 2014. Xuesong will make an oral presentation titled "Upgraded bio-oil from packed-bed catalysis over Ni/HZSM-5 with the addition of ethanol vapor coupled with microwave pyrolysis of Douglas fir pellets" at the conference.
10. **Travel Award:** PhD student **Lei Zhu**, under the supervision of Dr. **H. Lei**, won a travel award of about \$2,858 from WSU Department of Biological Systems Engineering to attend the 2014 American Society of Agricultural and Biological Engineers (ASABE) International Conference to be held at Montreal, QC Canada in July 2014. Lei will make an oral presentation titled "Characterization of Surface Functional Groups in Corn Stover Biochar Derived from Microwave-assisted Pyrolysis" at the conference.

2013 My Students' Achievements/Awards (3)

9. **Graduate Studies Achievement Award:** PhD student Quan Bu (Aug. 2010-Aug. 2013), under the supervision of Dr. **H. Lei**, won WSU BSysE Graduate Studies Achievement Award - Alfred and Genevieve Gallucci Scholarship of \$1000, May 2013.
8. **CSC Scholarship:** PhD student Xuesong Zhang (Jan. 2013-Dec. 2016), under the supervision of Dr. **H. Lei**, won China Scholarship Council (CSC) Scholarship (\$1300 per month for 4 years), May 2013; it is highly competitive nationally, especially difficult to be awarded for current students who are already enrolled in US universities; only 8 US-universities enrolled students were awarded CSC Scholarship in the years before 2013
7. **Paper Award:** PhD student Lu Wang (Aug. 2010-Aug. 2013), under the supervision of Dr. **H. Lei** (co-author), won Second Place Paper Award of "Catalytic upgrading of Douglas fir sawdust pellet vapors over Zn/ZSM-5 catalysts in a packed-bed catalysis reactor". Paper No. 1594800. AOC Paper Competition of ASABE Annual International Meeting, Kansas City, Missouri in July 2013

2012 My Students' Achievements/Awards (4)

6. **Paper Award:** PhD student Shoujie Ren (Jan. 2010-Dec. 2012), under the supervision of Dr. **H. Lei** (co-author), won Third Place Paper Award of "Optimum conditions and characteristics of products from microwave torrefaction of Douglas fir sawdust pellet ". Paper No. 121337334. AOC Paper Competition of ASABE Annual International Meeting, Dallas, Texas in July 2012
5. **CSC Scholarship:** PhD student Lei Zhu (Aug. 2012-Aug. 2016), under the supervision of Dr. **H. Lei**, won China Scholarship Council (CSC) Scholarship (\$1300 per month for 4 years), May 2012

4. **Travel Award:** PhD Student Shoujie Ren (Jan. 2010-Dec. 2012), under the supervision of Dr. **H. Lei**, won a travel award of \$450 from WSU Graduate & Professional Student Association (GPSA) to attend the 2012 American Institute of Chemical Engineers (AIChE) Annual Conference to be held at Pittsburgh, PA in Oct-Nov 2012. Shoujie made an oral presentation titled “Furfural Production from Microwave Catalytic Torrefaction of Douglas Fir Sawdust Pellets” at the conference.
3. **Travel Award:** PhD Student student Quan Bu (Aug. 2010-Aug. 2013), under the supervision of Dr. **H. Lei**, won a travel award of \$450 from WSU Graduate & Professional Student Association (GPSA) to attend the 2012 American Society of Agricultural and Biological Engineers (ASABE) International Conference to be held at Dallas, Texas in July 2012. Quan made an oral presentation titled “Phenols and fuels from catalytic microwave pyrolysis of lignocellulosic biomass” at the conference.

2011 My Students' Achievements/Awards (2)

2. **CSC Scholarship:** PhD student Yi Wei (Aug. 2011-Aug. 2015), under the supervision of Dr. **H. Lei**, won China Scholarship Council (CSC) Scholarship (\$1300 per month for 4 years), May 2011
1. **National Science Foundation Travel Award:** PhD student Shoujie Ren (Jan. 2010-Dec. 2012), under the supervision of Dr. **H. Lei**, won a travel award of \$447 from University of Florida (UF) travel office through the National Science Foundation to attend the ASME 2011 International Manufacturing Science and Engineering Conference (MSEC) to be held at the Oregon State University, Corvallis, OR in June 2011. Shoujie made an oral presentation titled “Microwave torrefaction of corn stover and tech-economic analysis” at the conference.

PROFESSIONAL AFFILIATIONS

- **Professional member** of American Society of Agricultural and Biological Engineers (2002-present)
- **Professional member** of Association of Oversea Chinese Agricultural, Food and Biological Engineers (2002-present)
- **Life Member** of Alpha Epsilon (The Honor Society of Agricultural, Food, and Biological Engineering) (2002-present)
- **Professional member** of American Association of Cereal Chemists (2003-2009)
- **Professional member** of Institute of Food Technologists (2002-2009)

PROFESSIONAL ACTIVITIES

- **Division Editor**, Division of Renewable Energy System, “International Journal of Agricultural and Biological Engineering”, 2008 to present
- **Editorial Board Member** of *Journal of Sustainable Bioenergy Systems* (JSBS), since 2012
- **Associate Editor**, Division of Agro-Product and Food Processing Engineering “International Journal of Agricultural and Biological Engineering” 2008 to present
- **Editorial Board Member** of “International Journal of Agricultural and Biological Engineering”, 2008 to present
- **Editorial Board Member** of “Journal of Global Ecology and Environment”, 2015 to present
- **Elected Member At-Large of the Executive Board**, Association of Overseas Chinese Agricultural, Biological, and Food Engineers (AOCABFE), 2013-2015

- **Director of Professional Development**, Association of Overseas Chinese Agricultural, Biological, and Food Engineers (AOCABFE), 2013-2015
- **Program Chair** of PRS 280 Bioprocessing for Value Added Products Session, ASABE BE-28 Bioconversion and Bioprocess Committee (August 2015-July 2016)
- **Committee Member**, BE-28 Bioconversion and Bioprocess Committee, American Society of Agricultural and Biological Engineers (ASABE), since July 2013
- **Judge** on Boyd-Scott Graduate Research Award of ASABE – The Society for Engineering in Agricultural, Food, and Biological Systems, PhD research papers, April-May, 2015
- **Judge** on Boyd-Scott Graduate Research Award of ASABE – The Society for Engineering in Agricultural, Food, and Biological Systems, PhD oral presentations at ASABE meeting, July, 2015
- **Judge** on Boyd-Scott Graduate Research Award of ASABE – The Society for Engineering in Agricultural, Food, and Biological Systems, MS research papers, April-May, 2014
- **Member of Judging Panel** for AOC student ASABE paper competition, Association of Overseas Chinese Agricultural, Biological, and Food Engineers (AOCABFE), 2014
- **Judge** on Boyd-Scott Graduate Research Award of ASABE – The Society for Engineering in Agricultural, Food, and Biological Systems, PhD research papers, April-May, 2013
- **Judge** on Boyd-Scott Graduate Research Award of ASABE – The Society for Engineering in Agricultural, Food, and Biological Systems, PhD oral presentations at ASABE meeting, July, 2013
- **Judge** on 2012-2013 MESA USA National Engineering Competition
- **Member of the Peer Review Panel** for Sigma Xi Competition: Research proposals and papers, March 2009
- **Conference Program Chair**, FPE 23 Thermo-Chemical Conversion Poster Session, ASABE international Annual Meeting, July, 2008

INVITED PROGRAM PANELIST/REVIEWER (103 proposals reviewed)

Invited Grant Panelist on US Federal Programs (91 Proposals Reviewed):

- **Invited Grant Panel Member** on DOE-Targeted Algal Biofuels and Bioproducts (TABB) Program Panel, DOE Office of Energy Efficiency and Renewable Energy (EERE), the Bioenergy Technologies Office (BETO), February 2015 – 9 proposals reviewed
- **Invited Grant Panel Member** on USDA- Small Business Innovation Research (SBIR) Biofuels and Biobased Products Program, Virtual Panel, February 2015 –13 proposals reviewed
- **Invited Grant Panel Member** on USDA- Small Business Innovation Research (SBIR) Phase I Biofuels and Biobased Products Program, Washington D.C., February 2014 –16 proposals reviewed
- **Invited Grant Panel Member** on USDA National Institute of Food and Agriculture (NIFA) Agriculture and Food Research Initiative (AFRI) - Development and Sustainable Production of Regionally-appropriate Biomass Feedstocks Program (\$10M per proposed project) - Coordinated Agricultural Project (CAP), Washington D.C., June 2013 – 8 proposals reviewed
- **Invited Grant Panel Member** on USDA – Small Business Innovation Research (SBIR) Phase I Biofuels and Biobased Products Program, Washington D.C., February 2013 –19 proposals reviewed
- **Invited Grant Panel Member** on USDA Agricultural Food and Research Initiative (AFRI), National Institute of Food and Agriculture (NIFA), Institute of Bioenergy, Climate and Environment (IBCE), Development and Sustainable Production of Regionally-Appropriate Biomass Feedstocks Reverse Site Visit Panel of USDA (\$10M per proposed project), Washington D.C., April 2012 – 2 proposal teams and 2 proposals reviewed

- **Invited Grant Panel Member** on USDA- Small Business Innovation Research (SBIR) Phase I Biofuels and Biobased Products Program, Washington D.C., January 2012 –16 proposals reviewed
- **Invited Grant Panel Member** on USDA National Institute of Food and Agriculture (NIFA), Agriculture and Food Research Initiative (AFRI) - Development and Sustainable Production of Regionally-appropriate Biomass Feedstocks Program (\$10M per proposed project) - Coordinated Agricultural Project (CAP), Washington D.C., February-March 2012 – 8 proposals reviewed

Invited Reviewer on US Federal Programs (44 Proposals Reviewed):

- **Invited Grant Reviewer** on USDA- Small Business Innovation Research (SBIR), Forests & Related Resources Phase I Program, February 2015 – 1 proposal reviewed
- **Invited Grant Reviewer** on Ohio State University: Sustainable & Resilient Economy program, Feb 2016 – 1 proposal reviewed
- **Invited Grant Reviewer** on Renewable Electricity for Minnesota’s Future program, March 2016 – 4 proposals reviewed
- **Invited Grant Reviewer** on Maryland Industrial Partnerships Program (MIPS), June 2016 – 2 proposals reviewed
- **Invited Grant Reviewer** on USDA- Small Business Innovation Research (SBIR), Forests & Related Resources Phase I Program, February 2015 – 1 proposal reviewed
- **Invited Grant Reviewer** on USDA- Business Innovation Research (SBIR) Biofuels and Biobased Products Phase II Program, May 2015 – 1 proposal reviewed
- **Invited Grant Reviewer** on DOE ARPA-E: Transformational energy R&D concepts across the entire spectrum of energy technology, OPEN 2015 Program, April 2015 – 8 concept papers reviewed
- **Invited Grant Reviewer** on DOE- Incubator, Fuels and Lubricant Technologies Program, April-May 2014 – 2 proposal reviewed
- **Invited Grant Reviewer** on USDA- Business Innovation Research (SBIR) Biofuels and Biobased Products Phase II Program, April-May 2014 – 1 proposal reviewed
- **Invited Grant Reviewer** on USDA- Small Business Innovation Research (SBIR), Forests & Related Resources Phase I Program, January 2014 – 1 proposal reviewed
- **Invited Grant Reviewer** on USDA- Business Innovation Research (SBIR) Biofuels and Biobased Products Phase II Program, May 2013 – 1 proposal reviewed
- **Invited Grant Reviewer** on USDA- Small Business Innovation Research (SBIR), Forests & Related Resources Phase I Program, January 2013 – 1 proposal reviewed
- **Invited Grant Reviewer** on DOE ARPA-E: Reducing Emissions using Methanotrophic Organisms for Transportation Energy (REMOTE) Program, May 2013 – 10 concept papers reviewed
- **Invited Grant Reviewer** on USDA- Small Business Innovation Research (SBIR) Biofuels and Biobased Products Program, Phase II, May 2011 – 1 proposal reviewed
- **Invited Grant Reviewer** on DOE Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs, February 2011 – 3 proposals reviewed
- **Invited Grant Reviewer** on USDA- Small Business Innovation Research (SBIR) Biofuels and Biobased Products Program, January 2011 – 1 proposal reviewed
- **Invited Grant Reviewer** on DOE Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs, February 2010– 3 proposals reviewed
- **Invited Grant Reviewer** on USDA- Business Innovation Research (SBIR) Biofuels and Biobased Products Program, January 2010 – 2 proposal reviewed

Invited Grant Reviewer on International Programs (6 Proposals Reviewed)

- **Invited Grant Reviewer** on Research Grants Council of Hong Kong research program, March 2016 – 2 proposals reviewed
- **Invited Grant Reviewer** on Chilean National Science and Technology Commission research program, Dec 2016 – 1 proposal reviewed
- **Invited Grant Reviewer** on Canadian Mitacs Accelerate - PDF Award research Program, February 2015 – 1 proposal reviewed
- **Invited Grant Reviewer** on The Netherlands Organization for Scientific Research (NWO), Vici Domain Physical Sciences and Engineering Program, Sep. 2015 – 1 proposal reviewed
- **Invited Grant Reviewer** for Chilean National Science and Technology Commission, FONDECYT Program, November 2014 – 1 proposal reviewed

Invited Grant Reviewer on US Regional Programs (9 Proposals Reviewed):

- **Invited Grant Reviewer** on Ohio State University, OARDC Research Enhancement Competitive Grants Program, December 2014 – 1 proposal reviewed
- **Invited Grant Reviewer** on University of Idaho, Idaho Agricultural Experiment Station proposal, February 2013 – 1 proposal reviewed
- **Invited Grant Reviewer** on WSU ARC proposal December 2012 – 1 proposal reviewed
- **Invited Grant Reviewer** on WSU ARC proposal September 2012 – 1 proposal reviewed
- **Invited Grant Reviewer** on NE-SunGrant Program, March 2011 – 1 proposal reviewed
- **Invited Grant Reviewer** on Ohio State University, OARDC Research Enhancement Competitive Grants Program, January 2011 – 1 proposal reviewed
- **Invited Grant Reviewer** on Ohio State University, OARDC Research Enhancement Competitive Grants Program, December 2009 – 2 proposals reviewed
- **Invited Grant Reviewer** on Ohio State University, OARDC Research Enhancement Competitive Grants Program, November 2008 – 1 proposal reviewed

INVITED TECHNICAL REVIEWER (210 Manuscripts reviewed)

- *ACS Catalysis*
- *Applied Biochemistry and Biotechnology*
- *Applied Energy*
- *Applied Microbiology and Biotechnology*
- *Bioenergy Research*
- *Biofuels*
- *Biomass and Bioenergy*
- *Bioresource Technology*
- *Biotechnology for Biofuels*
- *Biotechnology Progress*
- *Bioprocess and Biosystems Engineering*
- *Catalyst Today*
- *Cereal Chemistry*
- *Chemical Papers*
- *CRC Press/ Taylor and Francis Group*
- *Frontiers of Chemistry*
- *Fuel*
- *Fuel Processing Technology*
- *Energies*

- *Energy Conversion and Management*
- *Energy and Fuels*
- *Green Chemistry*
- *Industrial & Engineering Chemistry Research*
- *International Agricultural Engineering Journal*
- *International Journal of Agricultural and Biological Engineering*
- *International Journal of Chemical Reactor Engineering*
- *International Journal of Green Energy*
- *International Journal of Hydrogen Energy*
- *International Journal of Food Properties*
- *John Wiley & Sons*
- *Journal of Analytical and Applied Pyrolysis*
- *Journal of Applied Polymer Science*
- *Journal of Biobased Materials and Bioenergy*
- *Journal of Chemical Technology & Biotechnology*
- *Journal of Food Science*
- *Journal of Sustainable Bioenergy Systems*
- *Molecular Catalysis*
- *Proceedings of the ASME*
- *Process Biochemistry*
- *The Organic Reactions Catalysis Society*
- *RSC Advances*
- *Scientific Research and Essays*
- *The Organic Reactions Catalysis Society*
- *Transactions of the ASABE*