MI LI

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EDUCATION

2015-present	**Post-Doctoral research associate**, *BioEnergy Science Center (BESC), Oak Ridge National Laboratory*, Oak Ridge, TN Projects: fractionation and chemical characterization of lignocellulose and bioproducts
2010-2014	**Ph.D., Forestry (wood chemistry)**, *Auburn University*, Auburn, AL Specialization: fractionation and functionalization of lignocelluloses GPA: 4.0/4.0
2006-2009	**M.S., Chemical Engineering**, *Northeast Forestry University*, Harbin, China GPA: 3.7/4.0
2000-2004	**B.S., Chemical Engineering**, *Northeast Forestry University*, Harbin, China GPA: 3.8/4.0

RESEARCH INTERESTS/EXPERTISE

- Lignocellulosic biomass fractionation
- Chemistry and functionalization of cellulose, hemicellulose, and lignin
- Biorefinery of lignocellulosic biomass and chemistry of lignocellulose-based materials

PUBLICATIONS/MANUSCRIPTS

----------*Accepted and Published*----------

1. **Li, M.**, et al. The Effect of Liquid Hot Water Pretreatment on the Chemical Structural Alteration and the Reduced Recalcitrance in Poplar. *Biotech Biofuels*. Tentatively accepted. doi: XXXXXX
2. Yao, L., Yang, H., Yoo, C., **Li, M.**, et al. Adsorption of Cellobiohydrolases I onto lignin fractions from dilute acid pretreated *Broussonetia papyrifera*. *Biores. Technol.* doi: 10.1016/j.biortech.2017.08.024
3. Wu, Q., Hao, N., Wells, T. Meng, X., **Li, M.**, Pu, Y., Liu, S. and Ragauskas, A.J. (2017) Characterization of products from hydrothermal carbonization of Pine. *Biores. Technol.* 244(1) 78-83. doi: 10.1016/j.biortech.2017.07.138
4. **Li, M.**, Pu, Y., Tschaplinski, T.J., Ragauskas, A.J. (**2017**) ^{31}P NMR Characterization of Tricin and Its Structurally Similar Flavonoids. *ChemistrySelect*. 2(12):3557–3561. doi: 10.1002/slct.201700735
5. Yoo, C.G., **Li, M.**, Meng, X., Pu, Y., and Ragauskas, R.J. (**2017**) Effects of organosolv and ammonia pretreatments on lignin properties and its inhibition for enzymatic hydrolysis. *Green Chem.*19, 2006-2016. doi: 10.1039/C6GC03627A

6. Meng, X., Yoo, C.G., **Li, M.**, Ragauskas, A.J. (**2016**). Physicochemical Structural Changes of Cellulosic Substrates during Enzymatic Saccharification. *J. Appl. Biol. Biotechnol.* 1(3): 00015. doi: 10.15406/jabb.2016.01.00015

7. **Li, M.**, Pu, Y., C.G., Gjersing, E., Decker, S.R., Doeppke, C., Shollenberger T., Tschaplinski, T.J., Engle, N.L., Sykes, R.W., Davis, M.F., Baxter, H.L., Mazarei, M., Fu, C., Dixon, R.R., Wang, Z-Y, Stewart, N., Ragauskas, R.J. (**2017**). Study of Traits and Recalcitrance Reduction of Field-grown COMT Down-regulated Switchgrass. *Biotechnol. Biofuels*. 10:12. doi: 10.1186/s13068-016-0695-7 (IF 6.4)

8. **Li, M.,** Pu, Y., Ragauskas, A.J. (**2016**). Current Understanding of the Correlation of Lignin Structure with Biomass Recalcitrance. *Front. Chem*. 4: 45. doi: 10.3389/fchem.2016.00045 (IF 2.7)

9. Meng, X., Pu, Y., Yoo, C.G., **Li, M.**, Bali, G. et al. (**2016**). An In-depth Understanding of Biomass Recalcitrance Using Natural Poplar Variants as the Feedstock. *ChemSusChem.* 10(1): 139-150. doi: 10.1002/cssc.201601303R1 (IF 7.1)

10. Mahadevan R., Adhikari S., Shakya R., Wang K., Dayton D., **Li, M.**, Pu Y., Ragauskas, A.J. (**2016**). Effect of torrefaction temperature on lignin macromolecule and product distribution from fast pyrolysis, *J. Anal. Appl. Pyrolysis.* 122: 95-105 (IF 4.0)

11. Pu, Y., Meng, X., Yoo, C.G., **Li, M.,** Ragauskas, A.J. (**2016**). Analytical Methods for Biomass Characterization during Pretreatment and Bioconversion. Book Chapter in *Valorization of Lignocellulosic Biomass in a Biorefinery: From Logistics to Environmental and Performance Impact*. Editors: Rajeev Kumar et al. Nova Science. E-book: https://www.novapublishers.com/catalog/product_info.php?products_id=59399

12. Yoo, C.G., Pu, Y., **Li, M.,** Ragauskas, A.J. (**2016**). Elucidating Structural Characteristics of Biomass Using Solution-state 2D-NMR with DMSO-d_6/HMPA-d_{18}. *ChemSusChem., 9(10), 1090-1095*. (IF 7.1)

13. **Li, M.,** Pu, Y., Yoo, C.G., Ragauskas, A.J. (**2016**). The Occurrence of Tricin and its Derivatives in Plants. *Green Chem.* 18(6), 1439-54. (IF 8.5)

14. Bass, P.S., Blue, L., Zhang, L., **Li, M.,** Cheng, Z.Y., Tu, M. (**2015**). Modeling of the Time-dependent Strain Response of Electroactive NCC-PEO and PVDF Composites. *Proc. SPIE 9430, Electroactive Polymer Actuators and Devices. doi:10.1117/12.2085260.*

15. Lai, C., Tu, M., **Li, M.,** Yu, S. (**2014**). Remarkable Solvent and Extractable Lignin Effects on Enzymatic Digestibility of Organosolv Pretreated Hardwood. *Biores. Technol.* 156, 92-99. (IF 4.9)

16. **Li, M.**, Tu, M., Cao, D., Bass, P., & Adhikari, S. (**2013**). Distinct Roles of Residual Xylan and Lignin in Limiting Enzymatic Hydrolysis of Organosolv Pretreated Loblolly Pine and Sweetgum. *J. Agric. Food Chem*. 61(3), 646-54. (IF 2.9)

17. **Li, M.**, Yang, Q., Liu, S. (**2009**). The Effect of Physicochemical Properties of Wood on the Production of Activated Carbon under Alkaline Conditions. *Proc. Northeast Forestry University*. 37 (2), 38-39. In Chinese.

18. Liu, Z., Liu, S., Li, X., Wang, H., **Li, M.** (**2008**). Current Opinion on the TiO2-adsorbed Photocatalyst in Waste Treatment. *Chemistry*. 71 (10), 755-764. In Chinese.

----------*Manuscripts Submitted to Journals*----------

1. Thomas, V., Kothari, N., Bhagia, S., Akinosho, H., **Li, M.**, et al. Relationship between Recalcitrance and Structural Changes of Populus Variants Following Pretreatment and Biological Digestion by CBP and Fungal Enzymes. *Submitted to Biotech Biofuels.*
2. Meng, X., Pu, Y., Sannigrahi, P., **Li, M.**, et al. The nature of hololignin. *Submitted to EES.*
3. **Li, M.**, Yoo, C.G. et al. Structural Alteration of Lignin in *GAUT4* Down-Regulated Switchgrass and its Significance to the Reduced Recalcitrance Phenotype of this Biomass Feedstock. *Drafted and ready for submission to Green Chem.*
4. Li, X., **Li, M.**, Pu, Y. et al. Inhibitory Effects of Lignin on Enzymatic Hydrolysis: The Role of Lignin Chemistry and Molecular Weight. *Submitted to Applied Energy*.
5. Liu, E., **Li, M.**, et al. Fractionation and characterization of lignin streams from engineered switchgrass pretreated by an aqueous ionic liquid. *Submitted to Green Chem.*
6. Thomas, V., Donohoe, B., **Li, M.** et al. CELF Pretreatment Deconstructs Corn Stover and *Populus* with Unprecedented Rates and Yields when Coupled with *C. thermocellum* CBP due to Lignin Removal and Alteration. *Submitted to EES.*
7. **Li, M.** et al. Kinetic Study of Catalytic Conversion of Monosaccharides into Lactic Acid under Alkaline Condition. *Submitted to Ind. Chem. Eng. Res.*

MEDIA REPORTS

1. Research has been highlighted and reported by US Department of Energy (DOE), and Newswise.com.

   Li, M. et al. (**2017**). Study of Traits and Recalcitrance Reduction of Field-grown COMT Down-regulated Switchgrass. *Biotechnol. Biofuels*. 10:12. doi: 10.1186/s13068-016-0695-7

INVITED PRESENTATIONS

1. Structural changes of the biopolymers in genetically modified switchgrass and their significance to the reduced biomass recalcitrance. *Chemical and Biomolecular Engineering (CBE) Graduate Seminar, February, 2017, Knoxville, TN.*
2. The way to renewable energy: effects of lignin and xylan on the enzymatic hydrolysis of organosolv pretreated biomass. *School of Forestry and Wildlife Sciences Seminar Series*, November, 2012, Auburn, AL.

ACADEMIC PRESENTATIONS

1. **Mi Li** et al. Structural Characterization of Field-grown COMT-downregulated Switchgrass and Their Importance to the Reduced Biomass Recalcitrance. *BioEnergy Science Center Annual Retreat Meeting*, July 2017, Chattanooga, TN. (Oral presentation)
2. **Mi Li** et al. Structural variations of cellulose, hemicellulose, and lignin in field-grown *COMT*-downregulated switchgrass. *BioEnergy Science Center Annual Retreat Meeting*, July 2017, Chattanooga, TN. (Poster presentation)

3. **Mi Li** et al. Lignin characterization revealing its structural diversity and tricin incorporation in vanilla tissues. *BioEnergy Science Center Annual Retreat Meeting*, July 2017, Chattanooga, TN. (Poster presentation)
4. **Mi Li** et al. ^{31}P NMR Characterization of Tricin and Its Structurally Similar Flavonoids. *BioEnergy Science Center Annual Retreat Meeting*, July 2017, Chattanooga, TN. (Poster presentation)
5. **Mi Li**, Pu Yunqiao et al. A Four-year Comparative Analysis of Lignin Structural Changes in *COMT* Down-regulated Switchgrass with Reduced-Recalcitrance Phenotype. *The 39th Symposium Biotechnology for Fuels and Chemicals*, May 2017, San Francisco, CA. (Oral presentation)
6. Chang Geun Yoo, **Mi Li** et al. Understanding the Effects of Ammonia and Organosolv Pretreatments on Physicochemical Characteristics of Lignin. *2016 AIChE Annual Meeting*, November 2016. San Francisco, CA. (Oral presentation)
7. Enshi Liu, **Mi Li** et al. Fractionation and Characterization of Lignin Streams from Engineered Switchgrass. *Frontier in Biorefining 2016 Conference*, November 2016. St. Siomons Island, GA. (Poster presentation)
8. **Mi Li** et al. Study of Lignin, Cellulose, and Lignin-Associated Sugars in *GAUT4* Down-Regulated Switchgrass Cell Walls and their Significance to the Reduced-Recalcitrance Phenotype of this Biomass Feedstock. *BioEnergy Science Center Annual Retreat Meeting*, June 2016, Chattanooga, TN. (Oral presentation)
9. **Mi Li** et al. Structural Characterization of *GAUT4* Down-regulated Switchgrass and Wild-type Control. *BioEnergy Science Center Annual Retreat Meeting*, June 2016, Chattanooga, TN. (Poster presentation)
10. **Mi Li** et al. Structural Characterization of Lignin in Field-grown *COMT* Down-regulated and Wild-type Switchgrass. *BioEnergy Science Center Annual Retreat Meeting*, June 2016, Chattanooga, TN. (Poster presentation)
11. **Mi Li** et al. Structural Characterization of Populus Variants Following Pretreatment and Biological Digestion by Fungal Enzymes and CBP. *The 38th Symposium Biotechnology for Fuels and Chemicals*, April 2016, Baltimore, MD. (Oral presentation)
12. **Mi Li** et al. Structural characterization of cellulose, hemicellulose, and lignin from *GAUT4* down-regulated switchgrass. *BioEnergy Science Center-Enabling Technologies Annual Workshop*, January 2016, Riverside, CA. (Oral presentation)
13. **Mi Li** et al. Structural characterization of Populus variants following pretreatment and biological digestion by CBP and fungal enzymes. *BioEnergy Science Center-Enabling Technologies Monthly Conference*, October 2015, Oak Ridge, TN. (Oral presentation)
14. **Mi Li** et al. Isolation and characterization of cellulose and hemicelluloses from non-transgenic and *T1-COMT2* down-regulated switchgrass. *BioEnergy Science Center Annual Retreat Meeting*, June 2015, Chattanooga, TN. (Poster presentation)
15. **Mi Li** et al. Surface Functionalization of Nanocrystalline Cellulose. *2014 AIChE Annual Meeting*, November, 2014, Atlanta, GA. (Poster presentation)

16. **Mi Li** et al. Advanced Nanoscale Materials Development from Renewable Cellulose. *School of Forestry and Wildlife Sciences Advisory Council Annual Meeting,* April 2014, Auburn, AL. (Poster presentation)
17. **Mi Li** et al. Kinetic Study of Catalytic Conversion of Monosaccharides into Lactic Acid under Alkaline Condition. *24th Annual Graduate Scholars Forum*, March 2014, Auburn, AL. (Oral presentation)
18. **Mi Li** et al. Value added co-product lactic acid development from lignocellulosic biomass sugars. *2013 AIChE Annual Meeting*, November, 2013, San Francisco, CA. (Oral presentation)
19. Maobing Tu, **Mi Li** et al. Distinct roles of lignin and xylan on the enzymatic hydrolysis of organosolv pretreated biomass. *245th ACS National Meeting & Exposition*, April, 2013, New Orleans, LA. (Oral presentation)
20. **Mi Li** et al. Distinct roles of lignin and xylan on the enzymatic hydrolysis of organosolv pretreated biomass. *23rd Annual Graduate Scholars Forum*, February 2013, Auburn, AL. (Oral presentation)
21. **Mi Li** et al. Distinct roles of lignin and xylan on the enzymatic hydrolysis of organosolv pretreated biomass. *2012 AIChE Annual Meeting*, November, 2012, Pittsburg, PA. (Oral presentation)
22. **Mi Li** et al. Distinct roles of lignin and xylan on the enzymatic hydrolysis of organosolv pretreated biomass. *Sun Grant Initiative 2012 National Conference*, October, 2012, New Orleans, LA. (Poster presentation)
23. **Mi Li** et al. Effects of lignin and xylan on the enzymatic hydrolysis rate of organosolv pretreated biomass. *NSF Lignocellulosic Biofuels Workshop*, June, 2012, Auburn, AL. (Poster presentation)
24. Maobing Tu, Jing Li, Sushil Adhikari, & **Mi Li**. Value added co-products development from biomass. *Research Week Auburn University*, April, 2012, Auburn, AL. (Poster presentation)
25. **Mi Li** et al. Fermentability of organosolv prehydrolysates from Loblolly Pine and Sweetgum. *22nd Annual Graduate Scholars Forum*, February 2012, Auburn AL. (Oral presentation)
26. **Mi Li** et al. Fermentability of organosolv prehydrolysates from Loblolly Pine and Sweetgum. *2011 AIChE Annual Meeting*, October, 2012, Minneapolis, MN. (Poster presentation)

TEACHING EXPERIENCE

- 01/2017-05/2017: Participated in teaching class *Biorenewable Polymer* in UTK.
- 01/2011-08/2014: Supervised and mentored four undergraduate students independently for their extra-curriculum research on biomass characterization.
- 2007-2010: Teaching *Biomaterials Chemistry* related classes for undergraduate in Northeast Forestry University (Harbin, China)

RESEARCH EXPERIENCE

Post-Doctoral research associate; Feb 2015 to present, *Oak Ridge National Laboratory;* TN

- Work for BioEnergy Science Center (BESC) funded by the Department of Energy (DOE) on biorefinery projects. Fractionation of cellulose, hemicellulose, and lignin from lignocellulosic materials. Structural characterization of biopolymers using FTIR, GPC, NMR, HPLC, HPIC, SEM, TGA, GC/MS, UV-vis. Investigate the importance of biopolymer structures to biomass recalcitrance for biofuel development.

PhD Research assistant; Aug 2010 to Dec 2014, *Auburn University;* Auburn, AL

- Fractionated woody biomass with acid, alkaline, and organic solvent; fully analyzed the chemical compositions of raw and pretreated biomass. Executed enzymatically hydrolyzing biomass into sugars and biologically converting hemicellulose sugars into gluconic acid and xylonic acid by *Gluconobacter oxydans* ATCC 621 and others by *Lactobaccilus*, *Saccharomyces cerevisiae*, and *Candida shehatae*. Determined the enzymes activities and adsorption isotherm. Executed cellulose nanocrystals (CNCs) production and modification by esterification, etherification, oxidation, surfactants, polyelectrolyte, and polymer grafting.

WORK EXPERIENCE

2015-present	Post-doctoral Research Associate, Oak Ridge National Laboratory, Oak Ridge, TN
2010-2014	PhD Research Assistant, Auburn University, AL
2007-2010	Assistant Provost at Northeast Forestry University, China
2004-2007	Assistant Associate Dean at Northeast Forestry University, China

KEY SKILLS

- Set up research projects with emphasis on the fundamental issues and conceptual framework. Execute and tune research objectives based on the related research publications.
- Proficient experiment conduction, results analysis and interpretation, and documentation.
- Proficient in biomass chemistry characterization by HPLC, HPIC, GPC, LC/MS, GC/MS, FTIR, NMR, and UV-vis. Good characterization ability on SEM, TGA, DSC, TEM, XRD, Zetasizer, and optical microscopy.
- Proficient in Origin, AI, ChemDraw, ChemSketch, Tenua, TopSpin, SAS, MS office..

AWARDS/HONORS

12/2014	Research featured in the cover page of Auburn University Graduate School Magazine
03/2014	Outstanding International Graduate Student Award, Auburn University
02/2014	Drummond award for outstanding Ph.D., School of Forestry & Wildlife Science
02/2014	Merriwether award of School of Forestry and Wildlife Science
11/2013	Outstanding Three Minute Thesis Presentation (rank 5^{th}/52), Auburn University
03/2013	Outstanding Oral Presentation, Graduate Scholars Forum, Auburn University
07/2008	Distinguished Paper Award, China Forestry Youth Academic Conference

04/2004 Outstanding Undergraduate Award, Northeast Forestry University, China

COMMUNITY AND VOLUNTARY WORK

05/2017 Judge for the poster section of the 39th SBFC (San Francisco, CA)

02/2017 2017 Tennessee Science Bowl

2016-2017 BioEnergy Science Center Council Members

02/2016 2016 Tennessee Science Bowl

2015-2016 BioEnergy Science Center Council Members

04/2014 School of Forestry and Wildlife Science 2nd Annual Spring Fling and Outdoor Expo

ACCADEMIC MEMBERSHIP

2016-present Regular membership, Society for Industrial Microbiology and Biotechnology

2016-present Regular membership, National Postdoctoral Association

2014-2015 The Honor Society of Phi Kappa Phi

2012-2013 Graduate Student Membership, American Institute of Chemical Engineers

2011-2014 Graduate Student Membership, Forest Products Society

2011-2014 Graduate Student Membership, Microbiology Club, Auburn University

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