Xiang Zhang

Departments of Chemistry and Pharmacology & Toxicology, University of Louisville
Louisville, KY 40292

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RESEARCH INTEREST

I am interested in molecular systems biology, by exploiting high-throughput technologies for analyses of complex mixtures to promote health and wellness. We develop high-throughput multi-dimensional chromatography mass spectrometry-based bioanalytical platforms for metabolomics, lipidomics and epitranscriptomics, using two-dimensional liquid chromatography-mass spectrometry (2DLC–MS) and comprehensive two-dimensional gas chromatography mass spectrometry (GC×GC–MS). Using the high information content data generated from these bioanalytical platforms, we further develop advanced bioinformatics algorithms and data analysis platforms to uncover the biological information from the massive instrument data. The developed bioanalytical and bioinformatics platforms are then integrated and employed to discover molecular biomarkers and to understand the mechanisms of molecular regulation changes in a biological system.

EDUCATION

Ph.D. in Analytical Chemistry, 2001
Department of Chemistry, Purdue University, West Lafayette, Indiana, USA
Advisor: Prof. Fred E. Regnier

M.S. in Nuclear Physics, 1994
Institute of Modern Physics, Chinese Academy of Sciences, Lanzhou, CHINA
Advisor: Prof. Wenxin Li

B.S. in Radiochemistry, 1989
Department of Modern Physics, Lanzhou University, Lanzhou, CHINA
Advisor: Prof. Daren Ling

POSITIONS AND PROFESSIONAL ACTIVITIES

06/2018 – present	President, Chinese American Chromatography Association
06/2016 – 05/2018	President Elect, Chinese American Chromatography Association
12/2013 – present	Professor of Pharmacology & Toxicology, University of Louisville School of Medicine, Louisville, KY.
10/2013 – present	Director, Center for Regulatory and Environmental Analytical Metabolomics, University of Louisville, Louisville, KY.
06/2012 – 05/2016	Secretary, Chinese American Chromatography Association
07/2011 – present	Professor of Chemistry, University of Louisville School of Arts & Sciences, Louisville, KY.
01/2008 – 06/2011	Associate Professor of Chemistry, University of Louisville School of Arts & Sciences, Louisville, KY.
04/2004 – 12/2007	Research Assistant Professor, Bindley Bioscience Center, Purdue University, West Lafayette, IN.
06/2001 – 03/2004	Senior Scientist, Beyond Genomics Medicine, Waltham, MA.
08/1996 – 05/2001	Research Assistant, Department of Chemistry, Purdue University, West Lafayette, IN.
08/1994 – 07/1996	Research Associate, Institute of Modern Physics, Chinese Academy of Sciences, Lanzhou, China.
07/1989 – 07/1991	Patent Agent, Institute of Science & Technology Information of Gansu Province, Lanzhou, China.

AWARDS AND RECOGNITION

1. 2019 Distinguished Faculty Award, University of Louisville
2. 2019 Career Achievement Award, College of Arts and Sciences, University of Louisville
3. 2017 University Scholar, University of Louisville
4. 2014 University Scholar, University of Louisville
5. 2007 Seed for Success Award, Purdue University
6. 2007 Bioinformatics Platform Dissemination Award, Canary Foundation
7. 2005 Seed for Success Award, Purdue University
8. 2005 Professional Development Award, Purdue University
9. 2004 Seed for Success Award, Purdue University
10. 2004 Patent Agent, the United State Patent and Trademark Office, US
11. 2000 Jon and Ruthanna Amy Travel Award, Purdue University
12. 1992 Patent Agent, the Patent and Trademark Office, China

RESEARCH GRANTS

Active Research Support

9. NIH/NCI 1R21CA245560-01 K. Yaddanapudi (PI) $368,445 12/07/19-11/30/21
   Overcoming resistance to cancer immunotherapy by targeting MDSC-derived adenosine
   The objective of this study is to test the anti-tumor efficacy of a novel cancer immunotherapy involving systemic administration of adenosine deaminase (ADA)—an enzyme that irreversibly converts adenosine into inosine, a non-immunosuppresive nucleoside.
   Role: Co-I

8. NIH/NCI 1R01CA227874-01 D. Guo (PI) $1,248,000 07/01/19-06/30/24
   Defining the molecular mechanisms regulating the hexosamine-N-glycosylation pathway in glioblastoma
   The objective of this study is to better understand glioblastoma (GBM) pathogenesis in order to provide the foundation for identifying new effective approaches to target GBM.
   Role: Sub-PI

7. NIH/NCI 1R01CA213990-01 J. Yan (PI) $1,761,375 02/06/17-01/31/22
   Transcriptional Regulation of Immunosuppressive Macrophages by c-Maf in Cancer
   The objective of this study is to investigate the mechanisms of transcriptional regulation of immunosuppressive macrophages induced by trascription factor c-Maf in cancer.
   Role: Co-I

6. NIH/NIGMS 1P20GM113226-01 C. McClain (Director) $11,530,145 06/10/16-03/31/21
   The Hepatobiology and Toxicology COBRE
   The overarching theme of this grant is to maximize our capability for deciphering the mechanisms and therapy for liver injury, nutrition and gut:liver interactions, and liver:environment/toxin/drug interactions.
   Role: Omics Core Director

5. NIH/NIAAA 1P50AA024337-01 C. McClain (Director) $7,662,403 05/15/16-04/30/21
   The Role of Nutrition in the Development/Progression of Alcohol-induced Organ Injury
   The overarching theme of this center is to examine the role of nutrition in the development and progression of alcohol-induced organ injury.
   Role: Omics Core Director

4. NIH/NIEHS 2T32ES011564-11 G. Arteel (PI) $2,311,776 04/01/16-03/31/21
   UofL Environmental Health Sciences Training Program
   The objectives of this study are to establish a substantially improved pre-doctoral and postdoctoral training program that severs as an umbrella for interdisciplinary and integrated approaches to environmental health sciences.
   Role: Mentor

3. NIH/NIAAA 1R01AR067188-01 W. Feng (PI) $1,226,000 09/15/15-08/31/20
Mechanisms of Probiotics in Alcoholic Liver Disease
The objectives of this study are to elucidate mechanisms of gut barrier dysfunction in experimental alcoholic liver disease (ALD) and to define specific mechanisms of action of *Lactobacillus rhamnosus* Gorbach-Goldin (LGG)/ LGG supernatant (LGGs) in the treatment of experimental ALD.
Role: Co-I

2. NIH/NIAMS 1R01AR067188-01 M. Kosiewicz (PI) $2,094,514 09/01/15-08/31/20
Interplay of Androgens, Microbiota and Immunoregulation in Lupus
The objective of this study is to understand the independent and interdependent effect of the microbiota and androgens on the immune response.
Role: Co-I

1. Industry Research Gift X. Zhang (PI) $90,000 No time limit
Mass Informatics of Differential Metabolomics
The goal of this project is to support the bioinformatics projects to study metabolite regulation.
Role: PI

Completed Research Support

21. UofL/EVPRI X. Zhu, X. Zhang (PI) $9,800 01/01/19-12/31/19
Statistical algorithms to analyze metabolomic data for peak detection
This interdisciplinary project will develop a LC-MS peak deconvolution method using a mixed-effect skew-t mixture model, and further apply the developed method for metabolomics studies.
Role: Co-PI

20. Lupus Research Institute M. Kosiewicz (PI) $565,358 02/01/15-01/31/19
Sex and Microbiota Influence on Immunoregulation and Disease in BWF1Mice
The objective of this study is to identify of protective metabolites in male microbiota from lupus-prone mice using both LC-MS and GC×GC-MS.
Role: Co-I

19. NIH/NHLBI 3R01HL122581-02S1 S. Baba, X. Zhang (PIs) $149,934 09/15/15-04/30/17
Cardiac Pathophysiology of Histidyl Dipeptides
This study uses a combination of global metabolomic analysis and stable isotope labeling assisted untargeted metabolomics (SIAM) approach to determine derangements in the global metabolome of the myocardium and the appearance of metabolites in the perfusate of hearts subjected to low flow I/R ex vivo, and further to determine the role of histidyl dipeptides in preventing I/R injury.
Role: Co-PI

18. NSF DMS-1312603 S. Kim (PI) $180,000 09/01/13-02/28/17
Bayesian Ensemble Metabolomic Network Construction
The goal of this project is to infer metabolic networks from the measurements of metabolites using this high-throughput comprehensive GC×GC-MS.
Role: Co-Investigator

17. NIH/OD 1S10OD020106-01 X. Zhang (PI) $600,000 02/27/15-02/26/16
Ultra Performance Liquid Chromatography High Resolution High Mass Accuracy Mass Spectrometer
The objective of this study is to acquire a UPLC system with capability of two dimensional separation and a high resolution, high mass accuracy mass spectrometer for metabolomics.
Role: PI

16. NIH/NIDDK 3R01DK091338-02S1 L. Cai, X. Zhang (PIs) $150,000 09/10/14-08/31/15
Metabolomics Study on the Preventive Mechanisms for LDR on Diabetic Nephropathy

The objective of this study is to apply low-dose radiation (LDR) as a new and non-invasive tool to prevent and treat diabetic nephropathy through stimulation of renal multiple protective mechanisms against oxidative damage and inflammation.
Role: Co-PI

15. KSEF KSEF-13-RDE-017 W. Feng (PI) $30,000 07/01/14-06/30/15
Identification of Active Ingredients in Probiotic Culture Supernatant for Alcohol-induced Intestinal Barrier Dysfunction
The goal of this project is to identify a list of bioactive molecules in the LGGs, which will form the basis for probiotic-based drug development for liver disease.
Role: Co-I

14. NIH/NIEHS 1R21ES021311 W. Watson (PI) $450,000 04/01/12–03/30/15
Effect of Dietary Fat on the Hepatotoxicity of Environmental Arsenic
In this project, we will test the hypothesis that arsenic exposure facilitates the progression from simple steatosis to steatohepatitis by altering metabolic pathways related to inflammation. We will use a combination of metabolomics and proteomics to identify pathways that are dysregulated in our novel animal model of environment-diet interactions.
Role: Co-I

13. NIH/NIGMS 1RO1GM087735 X. Zhang (PI) $1,405,380 05/01/09–04/30/14
Mass Informatics of Two Dimensional Gas Chromatography Time-of-flight Mass Spectrometry
This project will develop informatics tools to analyze metabolomics data generated from comprehensive two-dimensional gas chromatography time-of-flight mass spectrometry experiments to enable comparative metabolite profiling with high precision and high volume.
Role: PI

12. Industry Grant X. Zhang (PI) $71,939 04/01/12–03/31/13
Development of Peak Alignment Methods for High-resolution Gas Chromatography Mass Spectrometry
This project will develop software package to align peak lists generated by both one-dimensional and two-dimensional gas chromatography mass spectrometry.
Role: PI

11. NIH/NIAAA 1RC2AA019385 C. McClain (PI) $1,616,440 10/01/09–09/30/12
Biomarkers for Steatohepatitis
This project will discover metabolite and protein biomarkers for steatohepatitis using high-information-throughput technologies and advanced bioinformatics methods.
Role: Co-I

10. UofL/MRG M. Yu (PI) $10,000 06/01/11–05/31/12
Quantum Mechanics Simulation-based Metabolite Identification
This project will create an in-silico MS/MS database based on quantum mechanics simulation. A bioinformatics system will be further developed for metabolite identification using the in-silico MS/MS database.
Role: Co-I

9. MMRF M. Wang (PI) $750,000 08/01/08–07/31/11
Biomarker Discovery and Validation in Multiple Myeloma Cells Using Multiple Proteomics Platforms
The goal of this project is to employ cutting-edge proteomic technologies to analyze myeloma patient tissue samples and identify biomarkers that are responsible for the disease's onset and progression, as well as patients' response to treatments.
Role: Co-I

8. NIH/NCI 1U24CA126480 F. Regnier (PI) $6,986,506 10/01/06–09/30/11
APT: the Analytical Proteomics Team

The major goal of this proposal is to develop robust protocols and standards for biomarker discovery in MS based proteomics. High specificity immunologic reagents will be developed for precise detection and quantification of biomarkers of relevance for breast and prostate cancer.
Role: Co-I

7. UofL/CEG 54079 X. Zhang (PI) $14,500 02/01/09–01/31/10
Development of Two Dimensional Gas Chromatography Time-of-flight Mass Spectrometry
This one year project will assess the technical capability of comprehensive two-dimensional gas chromatography time-of-flight mass spectrometry for differential metabolomics.
Role: PI

6. UofL/MRG X. Fu (PI) $10,000 01/01/10–12/31/10
A Microdevice System for Direct Analysis of Volatile Metabolites in Biological Samples for Differential Metabolomics
This project will develop an integrated microGC system coupled with an MS instrument for rapid and sensitive analysis of biosamples such as body fluids and tissue samples for metabolite identification and quantification.
Role: Co-I

5. NIH/STTR 1R41RR024306-A1 X. Zhang (PI) $149,711 02/01/08–07/30/09
Accurate Protein Identification using Peptide Separation Information and Tandem MS Algorithms
This project will develop algorithms aimed at predicting peptide separation profiles for two-dimensional ion mobility spectrometry. The developed algorithms will be used to assist protein identification.
Role: PI

4. NIH/NIGMS U24GM077905 B. Wanner (PI) $1,077,550 06/01/06–05/30/09
Development of the www.Ecoli-Community.org Information Resource
The overall goal of this project is to develop an information resource for E. coli community.
Role: Collaborator

3. Canary Foundation X. Zhang, Y. Chen (PIs) $20,000 06/01/07–05/30/08
CAPS Bioinformatics Platform Dissemination
The major goal of this project is to develop bioinformatics system for meta data management for the computational proteomics analysis system.
Role: Co-PI

2. NIH/NIDDK R33DK070290 F. Regnier (PI) $4,719,117 10/01/04–09/30/07
Tools for Differential Metabolomics
The major goal of this project is to develop a new set of tools for characterizing and recognizing temporal changes in the metabolome of model organisms.
Role: Co-I

1. Showalter Trust SPS0IK44 S. Mohammed (PI) $65,000 07/01/06–06/30/07
Use of Proteomics to Determine Pathways of Metastasis
The major goal of this proposal is to identify biomarkers that distinguish metastatic mammary tumors in lymph and also evaluate the predictive value of the biomarkers.
Role: Co-I

REVIEWER OF RESEARCH PROPOSALS

1. National Institute of Health, US
    a. Instrumentation and Systems Development (ISD) Study Section (2011, 2012)
    b. Special Emphasis Panel (2013, 2015, 2016)
    c. R15 (2013, 2014)
    d. EMNR-V55 (2016)
    e. Common Fund Metabolomics Program (R03) (2017)
    f. Innovative Technologies for Cancer-Relevant Biospecimen Science (R21) (2017)

    g. Advanced Development and Validation of Emerging Technologies for Cancer-Relevant Biospecimen Science (R33) (2017)
2. National Science Foundation, US
    a. Division of Chemistry (2009)
    b. Chemical Measurements & Imaging (CMI) program (2013)
3. The Agence Nationale de la Recherche, France
    a. Programme de Recherche Translationnelle en Santé (2013)
4. Others: Palph E. Powe Junior Faculty Enhancement Award Program (2010), CEGIB Pilot Project Program (2010), CFRTC Pilot and Feasibility Application (2016)

REVIEWER OF FOLLOWING SCIENTIFIC JOURNALS

1. Analytical Chemistry
2. Bioinformatics
3. Scientific Reports
4. Journal of Proteome Research
5. Analytica Chimica Acta
6. Analytical Methods
7. PeerJ Analytical Chemistry
8. Food & Function
9. Drug Metabolism Reviews
10. Journal of Chromatography A
11. Journal of Chromatography B
12. Journal of Separation Science
13. Proteomics – Clinical Applications
14. Toxicological Sciences
15. Computer Science and Systems Biology
16. PloS ONE
17. Journal of Psychiatric Research
18. The Crop Journal
19. Current Metabolomics
20. Molecules
21. Microchemical Journal
22. Rapid Communications in Mass Spectrometry
23. IEEE Transactions on Computational Biology and Bioinformatics
24. FEMS Microbiology Letters
25. Statistics and Its Interface
26. Journal of Bioinformatics and Computational Biology
27. Electrophoresis
28. Methods of Enzymology
29. BMC Medical Genomics
30. Cancer Letters
31. Central European Journal of Biology
32. Cancer Chemotherapy and Pharmacology
33. Briefings in Functional Genomics and Proteomics
34. Proteomics
35. The ISME Journal
36. Protein Science
37. IEEE Transactions on Information Technology in Biomedicine

CONSULTANTSHIPS

1. 2008 – 2015 LECO Corporation, St. Joseph, MI
2. 2011 – 2014 Menssana Research, Inc. Newark, NJ
3. 2013 – 2014 David H. Murdock Research Institute, NC
4. 2010 – 2012 MaiHealth Inc., Columbus, IN

5. 2007 – 2009 Predictive Physiology and Medicine, Inc., Bloomington, IN
6. 2004 – 2005 Beyond Genomics Medicine, MA

MEMBER OF PROGRAM COMMITTEE

1. Program Committee Member, *14th Annual Conference of the Metabolomics Society*, Seattle, WA. June. 24-28, 2018.
2. Program Committee Member, *International Conference on Intelligent Computing (ICIC'17)*, Liverpool, UK. Aug. 7-10, 2017.
3. Session Chair, Bioinformatics: metabolite identification and quantification. *Pittcon 2017*, Chicago, IL. March 6-8, 2017.
4. Session Chair, Bioinformatics: metabolite identification and quantification. *Pittcon 2016*, Atlanta, GA. March 6-10, 2016.
5. Session Chair, Bioinformatics: metabolite identification and quantification. *Pittcon 2015*, New Orleans, LA. March 8-12, 2015.
6. Session Chair, Bioinformatics: metabolite identification and quantification. *Pittcon 2014*, Chicago, IL. March 2-6, 2014.
7. Workshop co-Chair, CACA: How to be successful in your career. *Pittcon 2014*, Chicago, IL. March 2-6, 2014.
8. Publicity co-Chairs, *9th International Conference on Intelligent Computing (ICIC'13)*, Nanning, Guangxi, China. July 28-31, 2013.
9. Publicity co-Chairs, *8th International Conference on Intelligent Computing (ICIC'12)*, Huangsan, Hunan, China. July 25-29, 2012.
10. Publicity co-Chairs, *7th International Conference on Intelligent Computing (ICIC'11)*, Zhengzhou, Henan, China. Aug 11-14, 2011.
11. Session Chair, *35th International Symposium on Capillary Chromatography (ISCC)*, San Diego, CA. May 1-5, 2011.
12. Special Session/Workshop Chair, *6th International Conference on Intelligent Computing (ICIC'10)*, Changsha, Hunan, China. Aug. 18-21, 2010.
13. Program Committee member, *7th International Workshop on Data Mining in Bioinformatics,* San Jose, California. Aug. 12, 2007.

TEACHING EXPERIENCE

University of Louisville

1. CHEM 622, Separation Sciences, S09, F10, F12, F14, F16, F18
2. CHEM 625, Advanced Analytical Chemistry, F08, S16, S19
3. CHEM 425, Instrumental and Statistical Analysis, F16, F17
4. CHEM 208, An Introduction to Chemical Analysis II, S13, F13, S14, S15, S18, S19
5. CHEM 207, An Introduction to Chemical Analysis I, S10
6. CHEM 210, An Introduction to Chemical Analysis IV, F09, F11, S12, S20
7. CHEM 209, An Introduction to Chemical Analysis III, F08, F09, F11, F13, S16, S20
8. CHEM 209H, An Introduction to Chemical Analysis III, S16

Purdue University

1. Workshop, Protein Identification in Mass Spectrometry-based Proteomics, April, 2006
2. CHEM 696D, Computational Proteomics and Metabolomics, Guest lecturer, Spring 2005, Spring 2006, Spring 2007

STUDENTS AND POSTDOCTORAL FELLOWS MENTORED

Research Faculty

Dr. Liqing He, Research Assistant Professor (09/2019–present), Dr. Xiaoli Wei, Research Assistant Professor (07/2014–12/2018), Dr. Imhoi Koo, Research Assistant Professor (07/2014–06/2016)

Postdoctoral Associates

Dr. Liqing He (08/2016–09/2019), Dr. Xiaoli Wei (01/2010 – 06/2014), Dr. Imhoi Koo (07/2010–06/2014), Dr. Jun Zhang (08/2009–07/2011), Dr. Bing Wang (08/2008–07/2011), Dr. Cheolhwan Oh (06/2005–12/2007)

Lab Technologists

Xipeng Ma (03/2018 – present), Xinmin Yin (06/2008–present), Biyun Shi (08/2014–05/2018)

Graduate Students

Md Touhidul Islam (PhD, 08/2019–present), Raobo Xu (PhD, 08/2019–present), Yuan Fang (PhD, 08/2016–present), Md Aminul Islam Prodhan (PhD, 01/2015–12/2019), Xue Shi (PhD, 08/2009–12/2014), Yuan Zhang (MS, 08/2010–05/2013), Aiqin Fang (MS, 08/2008–05/2011)

Undergraduate Students

Ryan P. Crowe (Spring 2019), Connor Smith (Summer 2014), Brent Hukill (Summer 2013), Jiayang Zhang (Summer 2012, 2013), Nathan R. Millson (F2019, S2020)

Visiting Scholars

Prof. Hsiao-yu Yang (2019), Bernat M. Pérez (2019), Shuting Yu (2019), Ting Linghu (2019), Prof. Yinmao Wei (2017), Zijun Wang (2013–2014), JiaYuan Zhang (2011–2013), Shiwen Wu (2011–2012), Yaping Zhao (2010–2011), Wenlong Sun (2010–2011), Hyeyoung Cho (2006–2007), Qi Ouyang (Programmer, 2006)

ACADEMIC SERVICE

University Service

Director, Center for Regulatory and Environmental Analytical Metabolomics (2013–present)
Research Computing Governance Council (2010–present)
Service Center Committee (2014–present)
Faculty Search Committee (JBCC 2014)

Department Service

Faculty Search Committee (2019), Staff Search Committee (2018), Lab Fee Committee (2016–present), Department Seminar Coordinator (2015), Faculty Search Committee, Chemistry (2015), Personal Committee (2012–2015, 2017–2019), Director of Graduate Admissions Committee (2010–2012), Graduate Admissions Committee (2009–2010), Undergraduate Advisor Committee (2008–2011)

Students' Original Research Proposal Committees

Tirtha Raj Sibakoti (2019), Anthony Ewurum (2019), Shengzong Liang (2015), Mumiye A. Ogunwale (2015), Sadakatali Shokatali Gori (2014), Yuan Zhang (2013), Xue Shi (2012), Sarah E Milliner (2011), Sebastien Laulhe (2011), Weibo Wang (2010), Juan Chen (2010), Richard T Woofter (2009), Rami Mahdi (2008)

Students' Dissertation Committees

Md Aminul Prodhan (2019), Tirtha Raj Sibakoti (2019), Shengzong Liang (2017), Mumiye A. Ogunwale (2017), Sadakatali Shokatali Gori (PhD, 2016), James Harder (PhD, 2015), Samantha M. Carlisles (MS, 2015), Xue Shi (PhD, 2014), Yuan Zhang (MS, 2013), Rafael Masitas (PhD, 2013), Stephanie Mattingly (PhD, 2013), Ruiqui Liu (MS, 2013), Sebastien Laulhe (PhD, 2013), Xuan Huang (PhD, 2012), Richard T Woofter (PhD, 2011), Weibo Wang (PhD, 2011), Yang Yang (MS, 2011), Rami Mahdi (PhD, 2010), Marybeth Miskovic (PhD, 2010), Lukasz Sztaberek (PhD, 2009), Weibo Wang (MS, 2009), Yang Han (MS, 2008), Catherine P. Riley (MS, 2008)

BOOKS

2010 De-Shuang Huang, Xiang Zhang, Carlos Alberto Reyes Garcia (Eds.): Advanced Intelligent Computing Theories and Applications, 6th International Conference on Intelligent Computing, ICIC 2010, Changsha, China, August 18–21, 2010, Proceedings. Lecture Notes in Computer Science. 6216 Springer 2010, ISBN 978-3-642-14931-3.

PUBLICATIONS

Submitted

173. Yuan, F.; Kim, S.; Yin, X.; Zhang, X.; Kato, I. Integrating two-dimensional gas and liquid chromatography mass spectrometry for untargeted colorectal cancer metabolomics: a proof of principle study. *J. Chromatogr. Sci.* **2019**, submitted.

172. Ren, D.; Quan, N.; Zhang, J.; Xuan Li, X.; He, L.; Zhang, X.; Li, J. Aged-related Sestrin2 modulates Pyruvate Dehydrogenase activity leading to a critical adaptive metabolic response during ischemia/reperfusion stress. *Circ. Res.* **2019**, submitted.
171. Zhao, J.; Conklin, D.; Guo, Y.; Zhang, X.; Obal, D.; Guo, L.; Jagatheesan, G.; Katragadda, K.; He, L.; Yin, X.; Prodhan, A. M.; Shah, J.; Hoetker, D.; Kumar, A.; Kumar, V.; Wempe, M.; Bhatnagar, A.; Baba, S. Cardiospecific overexpression of ATPGD1 increases histidine dipeptide levels and prevents myocardial ischemia-reperfusion injury. *J. Am. Heart Assoc.* **2019**, under revision.
170. Warner, D.R.; Warner, J.B.; Hardesty, J.E.; Song, Y.L.; King, T.N.; Kang, J.X.; Chen, C.; Xie, S.; Yuan, F.; Yin, X.; Ma, X.; Zhang, X.; Rouchka, E.C.; Whitlock, J.; Li, E.C.; Wang, G.P.; McClain, C.J.; Kirpich, I.A. Beneficial effects of decreased omega-6:omega-3 PUFA ratio on intestinal homeostasis and microbiota are linked to the improvement of liver injury associated with ethanol and LPS administration in mice. *PLoS ONE* **2019**, under revision.
169. Li, Z.; Kim, S.; Zhong, S.; Zhong, Z.; Kato, I.; Zhang, X. Coherent point drift peak alignment algorithms using distance and similarity measures for analysis of comprehensive two-dimensional gas chromatography mass spectrometry data. *Chemomatrics* **2019**, under revision.
168. Liu, M.; Tong, Z.; Ding, C.; Luo, F.; Wu, S.; Albeituni, S.; He, L.; Hu, X.; Tieri, D.; Rouchka, E.C.; Hamada, M.; Takahashi, S.; Gibb, A.G.; Kloecker, G.; Zhang, H.; Bousamra II, M.; Hill, B.G.; Zhang, X.; Yan, J. Transcription Factor c-Maf Is A Molecular Checkpoint that Controls Immune Suppression by Programing Macrophages in Lung Cancer. *J. Clin. Invest.* **2019**, submitted.
167. Reynolds, L.; Dougherty, S.; Kruer, T.; Metcalf, S.; Lorkiewicz, P.; He, L.; Yin, X.; Zhang, X.; Arumugam, S.; Young, L.; Sun, R.; Clem, B. Loss of Rb1 enhances glycolytic metabolism in Kras-driven lung tumors in vivo. *Cancers* **2019**, submitted.

2020

166. Liu, Y.; Chen, K.; Li, F.; Gu, Z.; Liu, Q.; He, L.; Shao, T.; Song, Q.; Zhu, F.; Zhang, L.; Jiang, M.; Zhou, Y.; Barve, S.; Zhang, X.; McClain, C.J.; Feng, W. Probiotic LGG prevents liver fibrosis through inhibiting hepatic bile acid synthesis and enhancing bile acid excretion in mice. *Hepatol.* **2020**, in press.
165. Yuan, F.; Harder, J.; Yin, X.; Zhang, X.; Kosiewicz, M.M. Effects of androgen depletion in mouse feces analyzed using multiple metabolic platforms. *J. Proteome Res.* **2020**, in press.
164. Warner, D.R.; Warner, J.B.; Hardesty, J.E.; Song, Y.L.; King, T.N.; Kang, J.X.; Chen, C.; Xie, S.; Yuan, F.; Prodhan, A.; Ma, X.; Zhang, X.; Rouchka, E.C.; Whitlock, J.; Li, E.C.; Wang, G.P.; McClain, C.J.; Kirpich, I.A. Decreased ω6/ω3 PUFA ratio attenuates ethanol-induced alterations in intestinal homeostasis, microbiota and liver injury. *J. Lipid Res.* **2020**, in press. (PMID: 31586017)
163. Liu, Q.; Liu, Y,; Li, F.; Gu, Z.; Liu, M.; Shao, T.; Zhang, L.; Zhou, G.; Pan, C.; He, L.; Cai, J.; Zhang, X.; Barve, S.; McClain, C.J.; Chen, Y.; Feng, W. Probiotic culture supernatant improves metabolic function through FGF21-adiponectin pathway in mice. *J. Nutr. Biochem.* **2020**, 75, 108256. (PMID: 31760308)

2019

162. Sundaram, K.; Miller, D.P.; Kumar, A.; Teng, Y.; Sayed, M.; Mu, J.; Lei, C.; Sriwastva, M.K.; Zhang, L.; Jun, Y.; Merchant, M.L.; He, L.; Yuan, F.; Zhang, X.; Park, J.W.; Lamont, R.J.; Zhang, H. Plant-derived exosomal nanoparticles inhibit pathogenicity of *Porphyromonas gingivalis*. *iScienc*e **2019**, 21, 308-327. (PMID: 31678913; PMCID: PMC6838522)
161. Lorkiewicz1, P.K.; Gibb, A.A.; Rood, B.R.; He, L.; Zheng, Y.; Clem, B.F.; Zhang, X.; Hill, B.G. Integration of flux measurements and pharmacological controls to optimize stable isotope-resolved metabolomics workflows and interpretation. *Sci. Rep-UK* **2019**, 9:13750. (PMID: 31548575; PMCID: PMC6757038)
160. Young, J. L.; Yan, X.; Xu, J.; Yin, X.; Zhang, X.; Arteel, G.E.; Barnes, G.N.; States, C.J.; Watson, W.; Kong, M.; Cai, L.; Freedman, J.H. Cadmium and high-fat diet disrupt renal, cardiac and hepatic essential metals. *Sci. Rep-UK.* **2019**, 9:14675. (PMID: 31604971; PMCID: PMC6789035)

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INVITED TALKS

85. Development of Mass Spectrometry-based Metabolomics. Department Seminar, Department of Chemistry, Southern Illinois University, Carbondale, IL. Sept. 26-27, 2019.
84. Mass Spectrometry-based Metabolomics. College of Agriculture, Shandong Agriculture University, Taian, China. Aug. 8, 2019.
83. High Resolution Mass Spectrometry, Operation and Data Analysis. College of Agriculture, Shandong Agriculture University, Taian, China. Aug. 8, 2019.
82. Sample Preparation in Metabolomics. College of Agriculture, Shandong Agriculture University, Taian, China. Aug. 7, 2019.
81. GC-MS and LC-MS for Analysis of Small Molecules. College of Agriculture, Shandong Agriculture University, Taian, China. Aug. 7, 2019.
80. Integrated Parallel Two-dimensional Liquid Chromatography Mass Spectrometry and Comprehensive Two-dimensional Gas Chromatography Mass Spectrometry for Metabolomics. *iCC2018*. Sept.13, 2018.
79. Integrated Parallel Two-dimensional Liquid Chromatography Mass Spectrometry and Comprehensive Two-dimensional Gas Chromatography Mass Spectrometry for Metabolomics. *47th International Symposium on High Performance Liquid Phase Separations and Related Techniques*. Washington, DC. July 28 – Aug. 2, 2018.
78. Mass Spectrometry-based Epitranscriptomics. Modern Research Center for Traditional Chinese Medicine, Shanxi University, TaiYuan, China. June 27, 2018.
77. Comprehensive Metabolomics for Accurate Metabolite Biomarker Discovery. Modern Research Center for Traditional Chinese Medicine, Shanxi University, TaiYuan, China. June 27, 2018.
76. Calculating the Second Dimension Retention Index in GC×GC-MS. Modern Research Center for Traditional Chinese Medicine, Shanxi University, TaiYuan, China. June 27, 2018.
75. Mass spectrometry-based metabolomics in CREAM. James Graham Brown Cancer Center Seminar Series, University of Louisville, Louisville, KY. May 9, 2018.
74. Development of mass spectrometry-based metabolomics. Center for Urban Responses to Environmental Stressors (CURES), School of Medicine, Wayne State University, Detroit, MI. March 22, 2018.
73. Mass Spectrometry-based Metabolomics. *Spring Meeting, Kentucky Chapter of American Statistical Association*, University of Louisville, March 2, 2018.
72. Bioinformatics for Proteomics and Metabolomics. College of Computer Science and Information Technology, Shanxi University, TaiYuan, China. Jan. 9, 2018.
71. Mass Spectrometry-based Epitransciptomics. Modern Research Center for Traditional Chinese Medicine, Shanxi University, TaiYuan, China. Jan. 5, 2018.
70. Stable Isotope Assisted Metabolomics. Modern Research Center for Traditional Chinese Medicine, Shanxi University, TaiYuan, China. Jan. 5, 2018.
69. Development of Mass Spectrometry-based Metabolomics. College of Agriculture, Shandong Agriculture University, Taian, China. Dec. 11, 2017.
68. Bioinformatics of Stable Isotope Assisted Metabolomics. *SCIX 2017*, Grand Sierra Resort, Reno, NV. Oct. 8-13, 2017.
67. Mass Informatics of Stable Isotope Assisted Metabolomics. *Pittcon 2017*, Chicago, IL. March 5-9, 2017.
66. Development of mass spectrometry-based metabolomics. Division of Pharmaceutics and Pharmaceutical Chemistry, College of Pharmacy, Ohio State University, Columbus, Ohio. Dec. 19, 2016.

65. Walking in the woods of metabolites with mass spectrometry. Department of Chemistry, Ohio University, Athens, Ohio. Nov. 28, 2016.
64. How to Present Your Work via Oral Presentation – personal opinion. Shanxi University, TaiYuan, China. July 26-July 26, 2016.
63. How to Present Your Work via Research Papers – personal opinion. Shanxi University, TaiYuan, China. July 26-July 26, 2016.
62. Integrative LCxLC-MS and GCxGC-MS Platform for Quantitative Metabolomics. Xi'an Jiao Tong University, Xi'an, Shaanxi, China. July 11-12, 2016.
61. Mass Informatics of Quantitative Metabolomics by Integrating LCxLC-MS and GCxGC-MS Data. *Pittcon 2016*, Atlanta, GA. March 6-10, 2016.
60. Effects of Different Dietary Doses of Copper and High Fructose Feeding on Rat Fecal and Liver Metabolome. *2016*, Atlanta, GA. March 6-10, 2016.
59. Toward elucidation of disease mechanism using mass spectrometry-based metabolomics. Xi'an Jiao Tong University, Xi'an, Shaanxi, China. Nov. 9, 2015.
58. Development of mass spectrometry-based metabolomics. Northwest Agriculture and Forest University, Yanling, Shaanxi, China. Nov. 7, 2015.
57. Toward deciphering of disease mechanism via mass spectrometry-based metabolomics. Dalian Institute of Chemical Physics, Chinese Academy of Science, Dalian, Liaoning, China. Nov. 3, 2015.
56. Unlocking the Power of Metabolomics. *International Workshop of Metabolomics*, Chung Gang University of Science and Technology, Taipei, Taiwan. Oct. 24-25, 2015.
55. Deciphering disease mechanisms using mass spectrometry-based metabolomics. *Department of Pediatrics Research Meeting*, Department of Pediatrics, University of Louisville, KY. Sept. 28, 2015
54. Unlocking the Power of Metabolomics. *Department of Seminar*, Department of Chemistry, West Virginia University, WV. Sept. 16, 2015
53. Walking in the Woods of Metabolites with Mass Spectrometry. Clariant Co, Louisville, KY. June 8, 2015.
52. Walking in the Woods of Metabolites with Mass Spectrometry. Barbara Ann Karmanos Cancer Institute, Wayne State University, MI. April 9, 2015.
51. Effects of dietary different doses of copper and high fructose feeding on rat fecal metabolome. *Pittcon 2015*, New Orleans, LA. March 8-12, 2015.
50. Stable Isotope Labeling Analysis for High Resolution Mass Spectrometry-based Metabolomics. *Pittcon 2015*, New Orleans, LA. March 8-12, 2015.
49. Bioinformatics of Mass Spectrometry-Based Stable Isotope Assisted Metabolomics. *Pittcon 2015*, New Orleans, LA. March 8-12, 2015.
48. Accurate Deconvolution of GC-MS Data Using Gaussian Model-based Curve Fitting of Selected Ion Chromatogram. *Pittcon 2015*, New Orleans, LA. March 8-12, 2015.
47. Metabolomics Study Reveals High Fructose Feeding Inducing Copper Deficiency. *Pittcon 2015*, New Orleans, LA. March 8-12, 2015.
46. Walking in the woods of metabolites with mass spectrometry. Department of Applied Chemistry, Northwestern Polytechnical University, Xi'an, China. Dec. 26, 2014.
45. Walking in the woods of metabolites with mass spectrometry. College of Life Sciences, Xi'an Jiaotong University, Xi'an, China. Dec. 21, 2014.
44. Metabolomics program at the CREAM Center. *Department seminar*, Department of Oral Immunology and Infectious Diseases, Dental School, University of Louisville, KY. Oct. 17, 2014.
43. Impact of chronic ethanol consumption on metabolic profiles of mouse liver: a time course study. *Pittcon 2014*, Chicago, IL. March 2-6, 2014.
42. A computation platform for GCxGC-TOF MS based metabolomics. *Pittcon 2014*, Chicago, IL. March 2-6, 2014.
41. Development of GCxGC-TOF MS based metabolomics for biomarker discovery. *Departmental Seminar*, Department of Genetics, Texas Biomedical Research Institute, TX. Dec. 17, 2013.
40. Development of MS based metabolomics. *Seminar*, Brown Cancer Center, University of Louisville, Louisville, KY. Nov. 21, 2013.

39. Development of mass spectrometry-based metabolomics for biomarker discovery. *International Workshop of Metabolomics*, Shanxi University, TaiYuan, China. Oct. 14-17, 2013.
38. A practical analytical workflow of GC-MS based metabolomics. *International Workshop of Metabolomics*, Shanxi University, TaiYuan, China. Oct. 14-17, 2013.
37. A computational platform for high resolution mass spectrometry-based and liquid chromatography mass spectrometry-based metabolomics. *Pittcon 2013*, Philadelphia, PA. March 17–21, 2013.
36. Metabolomics for study of nutritional interactions. *Pittcon 2013*, Philadelphia, PA. March 17–21, 2013.
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18. Two dimensional gas chromatography time-of-flight mass spectrometry based metabolomics. Department of Biochemistry and Molecular Biology, Indiana University School of Medicine, Indianapolis, IN. March 9, 2009.
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