

Na Li

Position: Associate Professor



Faculty: State Key Laboratory of Quality Research in Chinese Medicine, Macau Institute for Applied Research in Medicine and Health, Macau University of Science and Technology

Email: nli@must.edu.mo

Telephone: (853) 8897-2405

Fax No.: (853) 2882-5886

Office: I01-102

Mailing Address: Avenida Wai Long, Taipa, Macau

Teaching Modules: Chinese Medicine Chemistry (BP12209/BPAZ0010), Unique Processing Methods of Chinese Medicines (BP12307), Experimental Techniques in Natural Products Chemistry Research (ME 1008), Advances in Chinese Medicine Pharmaceutics (DCMSZ01/ME1005)

Research areas: Natural product chemistry; Mass spectrometry-based metabolomics and proteomics

Dr. Na Li obtained her Ph.D. degree in Medicinal Chemistry from China Pharmaceutical University in 1999. She proceeded to her postdoctoral training at Institute of Materia Medica of Chinese Academy of Medical Sciences and Peking Union Medical College (CAMS & PUMC) during 1999-2001. In 2001, she was sponsored by Japan Society for the Promotion of Science (JSPS) to work as a postdoctoral research fellow in Niigata University, Japan. From 2003 to 2007, she engaged in the study of bioactive compounds in The National Center for Drug Screening, Shanghai Institute of Materia Medica, Chinese Academy of Sciences (CAS). Her research in The Chinese University of Hong Kong during the period 2007 to 2011 mainly focused on the toxicity of natural products. She works as a principal investigator in Macau University of Science and Technology (MUST) from 2011, and the research interests include the method development and application of proteomics to reveal the mechanism of Chinese herbal medicines

as well as the identification of bioactive natural products. She has rich experience in the research of natural product chemistry, especially the isolation and structural elucidation of bioactive components and biomarkers using NMR and MS techniques. She has published more than 90 papers in number of international journals including Journal of Hepatology, PNAS, Analytical Chemistry, Journal of Medicinal Chemistry, Food Chemistry, Journal of Mass Spectrometry, Analytica Chimica Acta, Journal of Natural Products and etc.

Academic Qualifications

- 1999.7 Ph. D. China Pharmaceutical University, Nanjing, Jiangsu Province, China
1994.7 B. Sc. West China University of Medical Sciences, Chengdu, Sichuan Province, China

Working Experiences

- 2018.7 – Present Associate Professor, State Key Laboratory for Quality Research in Chinese Medicine, Macau University of Science and Technology
2011.9 – 2018.6 Assistant Professor, State Key Laboratory for Quality Research in Chinese Medicine, Macau University of Science and Technology
2007.11 – 2011.8 Research Associate, The Chinese University of Hong Kong, Hong Kong
2003.12 – 2007.10 Associate Professor, The National Center for Drug Screening, Shanghai Institute of Materia Medica, CAS
2001.11 – 2003.11 Postdoctoral Fellow, Niigata University, Japan
1999.9 – 2001.10 Postdoctoral Fellow, Institute of Mataria Medica, CAMS & PUMC

Representative Publications

- 1) XQ Bian, W Miao, M Zhao, YR Zhao, Y Xiao, N Li*, JL Wu*. Microbiota drive insoluble polysaccharides utilization via microbiome-metabolome interplay during Pu-erh tea fermentation. *Food Chem* **2022**, 377, 132007.
- 2) XQ Bian, XY Xie, JL Cai, YR Zhao, W Miao, XL Chen, Y Xiao, N Li*, JL Wu*. Dynamic changes of phenolic acids and antioxidant activity of Citri Reticulatae Pericarpium during aging processes. *Food Chem* **2022**, 373, 131399.
- 3) SS Chen, Y Fu, XQ Bian, M Zhao, YL Zuo, YH Ge, Y Xiao, JB Xiao, N Li*, JL Wu*. Investigation and dynamic profiling of oligopeptides, free amino acids and derivatives during Pu-erh tea fermentation by ultra-high performance liquid chromatography tandem

- mass spectrometry. *Food Chem* **2022**, *371*, 131176.
- 4) SL Gong, Y Zhuo, SS Chen, XL Hu, XX Fan, JL Wu*, N Li*. Quantification of Osimertinib and Metabolite-Protein Modification Reveals its High Potency and Long Duration of Effects on Target Organ. *Chem Res Toxicol* **2021**, *34(11)*, 2309.
 - 5) YQ Zhang, GY Yan, M Song, XQ Bian, TT Xu, YD Zhang, JL Wu, G Chan, QW Zhang*, N Li*. Identification and quantification of markers in *Azedarach Fructus* and *Toosendan Fructus*. *J Pharm Biomed Anal* **2021**, *202*, 114173.
 - 6) Y Zhuo, YD Zhang, M Li, HY Wu, SL Gong, XL Hu, Y Fu, XZ Shen, BQ Sun, JL Wu*, N Li*. Hepatotoxic evaluation of toosendanin via biomarker quantification and pathway mapping of large-scale chemical proteomics. *Food Chem Toxicol* **2021**, *153*, 112257.
 - 7) YH Ge, N Li, Y Fu, X Yu, Y Xiao, ZY Tang, JB Xiao, JL Wu*, ZH Jiang*. Deciphering superior quality of Pu-erh tea from thousands of years' old trees based on the chemical profile. *Food Chem* **2021**, *358*, 129602.
 - 8) SS Chen, GX Huang, WL Liao, SL Gong, JB Xiao, J Bai, WLW Hsiao, N Li*, JL Wu*. Discovery of the bioactive peptides secreted by *Bifidobacterium* using integrated MCX coupled with LC-MS and feature-based molecular networking. *Food Chem* **2021**, *347*, 129008.
 - 9) XL Hu, XQ Bian, WY Gu, BQ Sun, X Gao, JL Wu*, N Li*. Stand out from matrix: ultra-sensitive LC-MS/MS method for determination of histamine in complex biological samples using derivatization and solid phase extraction. *Talanta* **2021**, *225*, 122056.
 - 10) XQ Bian, Y Qian, BB Tan, K Li, XF Hong, CC Wong, L Fu, J Zhang, N Li*, JL Wu*. In-depth mapping carboxylic acid metabolome reveals the potential biomarkers in colorectal cancer through characteristic fragment ions and metabolic flux. *Anal Chim Acta* **2020**, *1128*, 62-71.
 - 11) YD Zhang, XX Zong, JL Wu, Y Liu, ZQ Liu, H Zhou, L Liu*, N Li*. Pharmacokinetics and tissue distribution of eighteen major alkaloids of *Aconitum carmichaelii* in rats by UHPLC-QQQ-MS. *J Pharm Biomed Anal* **2020**, *185*, 113226.
 - 12) MX Liu, N Li*, YD Zhang, ZY Zheng, Y Zhuo, BQ Sun, LP Bai, MM Zhang, MQ Guo, JL Wu*. Characterization of covalent protein modification by triclosan *in vivo* and *in vitro* via three-dimensional liquid chromatography-mass spectrometry: New insight into its adverse effects. *Environ Int* **2020**, *136*, 105423.
 - 13) MZ Zhu, N Li, F Zhou, J Ouyang, DM Lu, W Xu, J Li, HY Lin, Z Zhang, JB Xiao, KB

- Wang, JA Huang, ZH Liu*, JL Wu*. Microbial bioconversion of the chemical components in dark tea. *Food Chem* **2020**, 312, 126043.
- 14) GY Yan, J Li, SS Chen, Y Liu, JL Wu, XM Zhu,* N Li*. New limonoids from the fruits of *Melia toosendan* and their autophagic activities. *Phytochem Lett* **2020**, 35, 15–22.
 - 15) YH Ge, XQ Bian, BQ Sun, M Zhao*, Y Ma, YP Tang, N Li,* JL Wu*. Dynamic profiling of phenolic acids during Pu-erh tea fermentation using derivatization LC-MS approach. *J Agric Food Chem* **2019**, 67, 4568–4577.
 - 16) XX Zong, XJ Yan, JL Wu, ZQ Liu, H Zhou, N Li*, L Liu*. Potentially Cardiotoxic Diterpenoid Alkaloids from the Roots of *Aconitum carmichaelii*. *J Nat Prod* **2019**, 82, 980–989.
 - 17) XJ Yan, Y Zhuo, XQ Bian, JM Li, YD Zhang, LD Ma, GH Lu, MQ Guo, JL Wu*, N Li*. Integrated Proteomics, Biological Functional Assessments, and Metabolomics Reveal Toosendanin-Induced Hepatic Energy Metabolic Disorders. *Chem Res Toxicol* **2019**, 32, 668–680.
 - 18) YD Zhang, XQ Bian, J Yang, HY Wu*, JL Wu*, N Li*. Metabolomics of Clinical Poisoning by *Aconitum* Alkaloids using derivatization LC-MS. *Frontiers Pharmacol* **2019**, 10, 275.
 - 19) XQ Bian, N Li*, BB Tan, BQ Sun, MQ Guo, GX Huang, L Fu, WLW Hsiao, L Liu*, JL Wu*. Polarity-tuning Derivatization-LC-MS Approach for Probing Global Carboxyl-containing Metabolites in Colorectal Cancer. *Anal Chem* **2018**, 90(19), 11210-11215.
 - 20) Y Liang, GY Yan, JL Wu, XX Zong, ZQ Liu, H Zhou, L Liu*, N Li*. Qualitative and Quantitative Analysis of Lipo-alkaloids and Fatty acids in *Aconitum carmichaelii* using LC-MS and GC-MS. *Phytochem Anal* **2018**, 29, 398.
 - 21) WY Gu, MX Liu, BQ Sun, MQ Guo, JL Wu*, N Li*. Profiling of polyunsaturated fatty acids in human serum using off-line and on-line solid phase extraction-nano-liquid chromatography-quadrupole-time-of-flight mass spectrometry. *J Chromatogr A* **2018**, 1537, 141.
 - 22) Y Zhuo, JL Wu, XJ Yan, MQ Guo, N Liu, H Zhou, L Liu*, N Li*. Strategy for Hepatotoxicity Prediction Induced by Drug Reactive Metabolites Using Human Liver Microsome and Online 2D-nano-LC-MS Analysis. *Anal Chem* **2017**, 89, 13167.
 - 23) XQ Bian, BQ Sun, PY Zheng, N Li*, JL Wu*. Derivatization enhanced separation and sensitivity of long chain-free fatty acids: Application to asthma using targeted and non-

- targeted liquid chromatography-mass spectrometry approach. *Anal Chim Acta* **2017**, 989, 59.
- 24) MZ Zhu, N Li, YT Wang, N Liu, MQ Guo, BQ Sun, H Zhou, L Liu, JL Wu. Acid/Salt/pH Gradient Improved Resolution and Sensitivity in Proteomics Study Using 2D SCX-RP LC-MS. *J Proteome Res* **2017**, 16(9), 3470.
- 25) M Yang, J Ruan, H Gao, N Li, J Ma, J Xue, Y Ye, PP Fu, J Wang, G Lin. First evidence of pyrrolizidine alkaloid N-oxide-induced hepatic sinusoidal obstruction syndrome in humans. *Arch Toxicol.* **2017**, 91, 3913.
- 26) N Li, F Zhang, W Lian, HL Wang, J Zheng, G Lin. Immunoassay approach for diagnosis of exposure to pyrrolizidine alkaloids. *J. Environ. Sci. Health C Environ. Carcinog. Ecotoxicol. Rev.* **2017**, 35(3), 127.
- 27) XX Zong, GY Yan, JL Wu, EL Leung, H Zhou, N Li*, L Liu*. New C₁₉-Diterpenoid Alkaloids from the Parent Roots of *Aconitum carmichaelii*. *Tetrahedron Lett.* **2017**, 58, 1622.
- 28) MZ Zhu, N Li*, M Zhao, WL Yu, JL Wu*. Metabolomic profiling delineate taste qualities of tea leaf pubescence. *Food Res. Int.* **2017**, 94 (4), 36.
- 29) Y Liang, JL Wu, X Li, MQ Guo, EL Leung, H Zhou, L Liu*, N Li*. Anti-cancer and Anti-inflammatory New Vakognavine-type Alkaloid from the Roots of *Aconitum carmichaelii*. *Tetrahedron Lett.* **2016**, 57(52), 5881.
- 30) Y Liang, JL Wu, EL Leung, H Zhou, ZQ Liu, GY Yan, L Liu*, N Li*. Identification of Oxygenated Fatty Acid as a Side Chain of Lipo-Alkaloids in *Aconitum carmichaelii* by UHPLC-Q-TOF-MS and a Database. *Molecules* **2016**, 21(4), 437.
- 31) L Zhu, JQ Ruan, N Li, PP Fu, Y Ye, G Lin. A novel ultra-performance liquid chromatography hyphenated with quadrupole time of flight mass spectrometry method for rapid estimation of total toxic retronecine-type of pyrrolizidine alkaloids in herbs without requiring corresponding standards. *Food Chem.* **2016**, 194, 1320.
- 32) J Ruan, H Gao, N Li, J Xue, J Chen, C Ke, Y Ye, PP Fu, J Zheng, J Wang, G Lin. Blood pyrrole-protein adducts - A biomarker of pyrrolizidine alkaloid-induced liver injury in humans. *J. Environ. Sci. Health C Environ. Carcinog. Ecotoxicol. Rev.* **2015**, 33, 404.
- 33) WY Gu, N Li*, ELH Leung, H Zhou, XJ Yao, L Liu, JL Wu*. Rapid identification of new minor chemical constituents from *Smilacis Glabrae Rhizoma* by combined use of UHPLC-Q-TOF-MS, preparative HPLC and UHPLC-SPE-NMR-MS techniques. *Phytochem. Anal.* **2015**, 26, 428.

- 34) WY Gu, N Li*, ELH Leung, H Zhou, GA Luo, L Liu, JL Wu*. Metabolites software-assisted flavonoids hunting in plant using ultra-high performance liquid chromatography-quadrupole-time of flight mass spectrometry. *Molecules* **2015**, *20*, 3955.
- 35) JL Wu, EL Leung, H Zhou, L Liu*, N Li*. Metabolite analysis of toosendanin by an ultra-high performance liquid chromatography-quadrupole-time of flight mass spectrometry technique. *Molecules* **2013**, *18*, 12144.
- 36) YH Li, WL Kan, N Li, G Lin. Assessment of pyrrolizidine alkaloid-induced toxicity in an in vitro screening model. *J. Ethnopharmacol.* **2013**, *150*, 560.
- 37) J Ruan, N Li, et al. Characteristic ion clusters as determinants for the identification of pyrrolizidine alkaloid *N*-oxides in pyrrolizidine alkaloid-containing natural products using HPLC–MS analysis. *J. Mass Spectrom.* **2012**, *47*, 331.
- 38) Q Liu, N Li, et al. Cyclobutane derivatives as novel nonpeptidic small molecule agonists of glucagon-like peptide-1 receptor. *J. Med. Chem.* **2012**, *55*(1), 250.
- 39) H Gao, N Li, et al. Definitive diagnosis of hepatic sinusoidal obstruction syndrome induced by pyrrolizidine alkaloids. *J. Dig. Dis.* **2012**, *13*, 33.
- 40) G Lin,* JY Wang,* N Li, et al. Hepatic sinusoidal obstruction syndrome associated with consumption of *Gynura segetum*. *J. Hepatol.* **2011**, *54*, 666.
- 41) N Li, Q Xia, J Ruan, et al. Hepatotoxicity and tumorigenicity induced by metabolic activation of pyrrolizidine alkaloids in herbs. *Curr. Drug Metab.* **2011**, *12*, 823.