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职称：教授

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教学科目：中药化学、中药化学实验、中药炮制学、仪器分析、中药化学实验技术、中药研究进展、中药学研究进展

研究方向：基于 LC-MS 的化学蛋白质组学分析方法及应用、中药质量标准研究、天然产物化学

澳门科技大学中药质量研究国家重点实验室教授/博士生导师。多年来主要从事药物相关的研究工作，尤其是利用质谱、核磁共振及其联用技术、数据库和分子网等先进技术，对中药的活性及毒性成分进行鉴定、药物作用机理研究、中药质量标准提升等。近年来主要集中于三个研究方向：一是化学蛋白组学原创分析方法及应用，建立了一系列基于色谱-质谱的化学蛋白组学分析方法，并成功应用于药物的活性及毒性机制解析、共价键药物的开发；二是中药及经典名方质量标准研究，利用建立的全成分代谢组学分析方法，对中药，特别是药食同源中药进行质量研究、标准提升和产品开发；三是中药活性成分的快速发现技术和应用研究。整合 LC-MS/NMR、分子网、虚拟筛选等多种先进技术，实现了中药活性成分的快速筛选-鉴定-构效关系研究。同时，对中药的大分子物质建立了原创的分析方法，分离获得多种生物活性多糖，部分多糖已成功应用于 3D 打印。主持包括“重点研发资助计划”、“国家自然科学基金与澳门科学技术发展基金联合资助基金”在内的澳门科学技术发展基金项目 7 项，共同主持 1 项。到目前为止，在 *Environ Sci Technol*, *Food Hydrocolloid*, *Int J Biol Macromol*, *TRAC-Trend Anal Chem*, *Med Res Rev*, *Anal Chem*, *Food Chem* 等 SCI 杂志发表研究论文 120 余篇。申请和授权国际发明专利 9 项，国家发明专利 13 项。获批 ISO 国际标准 1 项。

学历

1999.7 中国药科大学理学博士学位

1994.7 华西医科大学理学学士学位

工作经历

2011.9 – 今 澳门科技大学助理教授、副教授、教授

2007.11 – 2011.8 香港中文大学副研究员

2003.12 – 2007.10 中国科学院上海药物研究所/国家新药筛选中心副研究员

2001.11 – 2003.11 日本新泻大学博士后

1999.9 – 2001.10 中国医学科学院协和医科大学药物研究所博士后

学术成果

近三年代表性论文：(*Corresponding author)

- 1) YH Ge, LL Zhang, SL Gong, W Miao, L Zhang, WB Bai, JL Wu*, **N Li***. FPS_P/N: A two-dimensional mass spectrometry utilization program with precursor ion determination for accurately distinguishing anthocyanin from other flavonoids. *J Pharm Anal* published online 10.1016/j.jpha.2025.101385.
- 2) XL Hu, JW Liu, JL Wu*, ZQ Xiong, **N Li***. Chemical Proteomics Unraveling the Contribution of Covalent Protein Modifications to Antidepressant Effects of Ketamine. *J Anal Test* published online <https://doi.org/10.1007/s41664-025-00369-8>.
- 3) X Wang, T Tian, **N Li***, LL Zheng, YY Wu, W Bian, JL Wu*, TT Zhou*. Characterization and gelling properties of pectin extracted from Gardenia fruit. *Food Hydrocolloids* **2025**, 163, 111055.
- 4) JQ Chen, WY Yuan, W Miao, SL Gong, J Zhou, Y Liu, JL Wu*, **N Li***. *In vitro* and *in vivo* immune-enhancing effects of polysaccharides with different molecular weights and structural characteristics from *Gastrodia elata* Blume. *Int J Biol Macromol* **2025**, 295, 139526.
- 5) XL Hu, JL Wu*, Q He, ZQ Xiong, **N Li***. Strategy for cysteine-targeting covalent inhibitors screening using in-house database based LC-MS/MS and drug repurposing. *J Pharm Anal* **2025**, 15, 101045.
- 6) SL Gong, GY Bai, YJ Ban, MX Liu, Y Liu, YY Wu, **N Li***, JL Wu*. The underappreciated diversity of furanocoumarins in grapefruits revealed by MassQL filtered molecular networking. *Food Chem X* **2025**, 25, 102233.

- 7) W Miao, **N Li***, JQ Chen, JL Wu*. Composition-dependent MRM transitions and structure-indicative elution segments (CMTSES)-based LC-MS strategy for disaccharide profiling and isomer differentiation. *Anal Chim Acta* **2025**, 1337, 343562.
- 8) J Han, QY Yang, Z Zheng, **N Li***, JL Wu*. Bromine signature coded derivatization LC-MS for specific profiling of carboxyl or carbonyl-containing metabolites in *Mycoplasma pneumoniae* infection. *Talanta* **2025**, 285, 127345.
- 9) L Zhang, SL Gong, YL Zuo, LL Zhang, JQ Chen, YQ Xu, YY Wu, YH Zhao, JL Wu*, **N Li***. Soybean fermentation drives the production of native neuroprotective peptides based on a peptidomics strategy. *Curr Res Food Sci* **2025**, 10, 101082.
- 10) MX Liu, ZY Ning, Y Cheng, ZY Zheng, XX Yang, T Zheng, **N Li***, JL Wu*. The key to 2,6-dichloro-1,4-benzoquinone reproductive toxicity and green tea detoxification: Covalent binding and competitive binding. *Ecotox Environ Safe* **2024**, 286, 117239.
- 11) S Zhang, F Yan, F Luan, Y Chai, **N Li***. YW Wang, ZL Chen, DQ Xu, YP Tang*. The pathological mechanisms and potential therapeutic drugs for myocardial ischemia reperfusion injury. *Phytomedicine* **2024**, 129, 155649.
- 12) XC Wang, XQ Bian, PP Dong, L Zhang, LL Zhang, CF Gao, HY Zeng, **N Li***, JL Wu*. Food processing drives the toxic lectin reduction and bioactive peptide enhancement in *Pinellia ternate*. *Curr Res Food Sci* **2024**, 9, 100895.
- 13) YL Zuo, SL Gong, L Zhang, J Zhou, JL Wu*, **N Li***. A Deep Mining Strategy for Peptide Rapid Identification in *Lactobacillus reuteri* Based on LC–MS/MS Integrated with FBMN and De Novo Sequencing. *Metabolites* **2024**, 14(9), 467.
- 14) J Zhou, JQ Chen, SL Gong, YJ Ban, L Zhang, Y Liu, JL Wu*, **N Li***. Isolation, bioactivity, and molecular docking of a rare gastrodin isocitrate and diverse parishin derivatives from *Gastrodia elata* Blume. *ACS Omega* **2024**, 9, 14520.
- 15) JQ Chen, W Miao, Y Liu, J Zhou, J Han, L Zhang, XQ Bian, T Zhong, JL Wu*, **N Li***. Structural characterization, molecular dynamic simulation, and conformational visualization of a water-soluble glucan with high molecular weight from *Gastrodia elata* Blume. *Int J Biol Macromol* **2024**, 263, 130207.
- 16) XL Hu, SL Gong, Q He, JL Wu*, **N Li***. Less is more: A new perspective for toxicity of emerging contaminants by structures, protein adducts and proteomics. *TrAC-Trends in Analytical Chemistry* **2023**, 167, 117289.
- 17) J Han, SL Gong, XQ Bian, Y Qian, GL Wang, **N Li***, JL Wu*. Polarity-regulated derivatization-assisted LC-MS method for amino-containing metabolites profiling in gastric cancer. *J Pharm Anal* **2023**, 13, 1353.

- 18) YH Ge, X Li, MZ Huang, ZX Huang, MM Wu, BQ Sun, LS Wang, JL Wu*, **N Li***. Aroma correlation assisted volatilome coupled network analysis strategy to unveil main aroma-active volatiles of *Rosa roxburghii*. *Food Res Int* **2023**, 169, 112819.
- 19) YQ Zhang, XQ Bian, GY Yan, BQ Sun, W Miao, MZ Huang, **N Li***, JL Wu*. Discovery of novel ascorbic acid derivatives and other metabolites in fruit of *Rosa Roxburghii* Tratt through untargeted metabolomics and feature-based molecular networking. *Food Chem* **2023**, 405, 134807.
- 20) WS Li, XX Pan, LR Chen, HS Cui, SC Mo, YD Pan, YR Shen, ML Shi, JL Wu, FF Luo*, J Liu*, **N Li***. Cell metabolism-based optimization strategy of CAR-T cell function in cancer therapy. *Front Immunol* **2023**, 1186383.
- 21) LL Zhang, **N Li***, SS Chen, XQ Bian, MA Farag, YH Ge, JB Xiao, JL Wu*. Carboxyl-containing compounds in food: category, functions, and analysis with chemical derivatization-based LC-MS. *TrAC-Trends in Analytical Chemistry* **2022**, 157, 116818.
- 22) SL Gong, XL Hu, SS Chen, BQ Sun, **N Li***, JL Wu*. Dual roles of drug or its metabolite-protein conjugate: cutting-edge strategy of drug discovery using shotgun proteomics. *Med Res Rev* **2022**, 42, 1704.
- 23) XL Hu, JL Wu*, W Miao, F Long, HD Pan, T Peng, XJ Yao, **N Li***. Covalent protein modification: an unignorable factor for bisphenol A induced hepatotoxicity. *Environ Sci Technol* **2022**, 56, 9536.
- 24) LL Zhang, JL Wu*, P Xu, S Guo, TT Zhou, **N Li***. Soy protein degradation drives diversity of amino-containing compounds via *Bacillus subtilis* natto fermentation. *Food Chem* **2022**, 388, 133034.
- 25) 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.
- 26) 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.
- 27) 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.
- 28) X Wang, **N Li***, SS Chen, YH Ge, Y Xiao, M Zhao, JL Wu*. MS-FINDER Assisted Understanding the Flavonoids Profile in Temporal Dimension during Fermentation of Pu-

erh Tea. *J Agric Food Chem* **2022**, *70*, 7085.