

李 娜



職稱： 教授

學院/部門：中藥質量研究國家重點實驗室

澳門藥物及健康應用研究院

電郵地址： nli@must.edu.mo

電話： (853) 8897-2405

傳真： (853) 2882-5886

辦公室： R421

郵寄地址： 澳門氹仔偉龍馬路 澳門科技大學

教學科目：中藥化學、中藥化學實驗、中藥炮製學、儀器分析、中藥化學實驗技術、中藥研究進展、中藥學研究進展

研究方向：基於 LC-MS 的化學蛋白質組學分析方法及應用、中藥質量標準研究、天然產物化學

澳門科技大學中藥質量研究國家重點實驗室教授/博士生導師。多年來主要從事藥物相關的研究工作，尤其是利用質譜、核磁共振及其聯用技術、數據庫和分子網路等先進技術，對中藥的活性及毒性成分進行鑒定、藥物作用機理研究、中藥質量標準提升等。近年來主要集中於三個研究方向：一是化學蛋白組學原創分析方法及應用，建立了一系列基於色譜-質譜的化學蛋白組學分析方法，並成功應用於藥物的活性及毒性機制解析、共價鍵藥物的開發；二是中藥及經典名方質量標準研究，利用建立的全成分代謝組學分析方法，對中藥，特別是藥食同源中藥進行質量研究、標準提升和產品開發；三是中藥活性成分的快速發現技術和應用研究。整合 LC-MS/NMR、分子網路、虛擬篩選等多種先進技術，實現了中藥活性成分的快速篩選-鑒定-構效關係研究。同時，對中藥的大分子物質建立了原創的分析方法，分離獲得多種生物活性多糖，部分多糖已成功應用於 3D 打印。主持包括“重點研發資助計畫”、“國家自然科學基金與澳門科學技術發展基金聯合資助基金”在內的澳門科學技術發展基金項目 7 項，共同主持 1 項。到目前為止，在 *Environ Sci Technol*, *Food Hydrocolloid*, *Int J Biol Macromol*, *TRAC-Trend Anal Chem*, *Med Res Rev*, *Anal Chem*, *Food Chem* 等 SCI 雜誌發表研究論文 120 餘篇。申請和授權國際發明專利 9 項，國家發明專利 13 項。獲批 ISO 國際標準 1 項。

學歷

1999.7 中國藥科大學理學博士學位

1994.7 華西醫科大學理學學士學位

工作履歷

2011.9 – 今 澳門科技大學助理教授、副教授、教授

2007.11 – 2011.8 香港中文大學副研究員

2003.12 – 2007.10 中國科學院上海藥物研究所/國家新藥篩選中心副研究員

2001.11 – 2003.11 日本新瀉大學博士後

1999.9 – 2001.10 中國醫學科學院協和醫科大學藥物研究所博士後

學術成果

近三年代表性論文：(*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.
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- 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.