个 人 简 历

刘文　博士
生命科学与技术学院 讲席教授

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研究方向

- ✧ 重要天然产物的生物合成（遗传学、生物化学和化学等）基础研究。
- ✧ 以功能分子发现和创造为导向的合成生物学技术与方法学研究。
- ✧ 抗生素产品的高效生物制造应用研究。

工作经历

- ✧ 2025 年 2 月至今：上海交通大学生命科学与技术学院，讲席教授
- ✧ 2003 年 8 月至 2025 年 2 月：中国科学院上海有机化学研究所，研究员
- ✧ 2019 年 9 月至 2025 年 2 月：中国科学院上海有机化学研究所，副所长
- ✧ 2009 年 9 月至 2024 年 12 月：生命有机国家重点实验室，副主任
- ✧ 2001 年 9 月至 2003 年 7 月：美国威斯康星大学麦迪逊分校药学院，博士后
- ✧ 2000 年 9 月至 2001 年 8 月：美国加州大学戴维斯分校化学系，博士后

教育背景

- ✧ 1994 年 9 月至 2000 年 8 月：中国协和医科大学（中国医学科学院）获硕士（1997 年）、博士学位（2000 年，美国加州大学戴维斯分校化学系联合培养），导师：李元教授、沈奔教授。
- ✧ 1988 年 9 月至 1992 年 7 月：四川大学生物工程系，获学士学位。

主要获奖情况

- ✧ 2025 年第十六届庄长恭化学化工科技进步奖；
- ✧ 2022 年上海市科技精英提名奖；
- ✧ 2022 年上海职工优秀创新成果一等奖；
- ✧ 2021 年上海市加快科创中心建设一等奖；
- ✧ 2019 年上海市自然科学一等奖（排名第一）；
- ✧ 2017 年国家“万人计划”科技创新领军人才；
- ✧ 2017 年中国科学院优秀导师奖；
- ✧ 2017 年工业生物技术年度创新先锋奖；
- ✧ 2015 年谈家桢生命科学创新奖；
- ✧ 2015 年科技部中青年科技创新领军人才；
- ✧ 2015 年国家百千万人才工程“有突出贡献中青年专家”；
- ✧ 2013 年日本化学会“Distinguished Lectureship Award”获得者；
- ✧ 2013 年上海市优秀学术带头人；
- ✧ 2012 年上海市领军人才；

- ✧ 2012 年中国科学院优秀研究生指导教师；
- ✧ 2011 年中国科学院优秀导师奖；
- ✧ 2010 年国务院政府特贴获得者；
- ✧ 2010 年中国药学会-赛诺菲安万特青年生物奖；
- ✧ 2010 年明治乳业生命科学奖（优秀奖）；
- ✧ 2009 年中科院“百人计划”终期评估“优秀”入选者；
- ✧ 2008 年上海市科技进步一等奖（排名第五）；
- ✧ 国家自然科学基金委 2005 年度“杰出青年基金”获得者；
- ✧ 上海市科学技术委员会 2005 年度“启明星计划”、2009 年“启明星追踪计划”和“浦江人才计划”入选者

学术任职

- ✧ Cell 杂志子刊《Cell Chemical Biology》编委：2015-2020
- ✧ 英国皇家化学会《Natural Product Reports》编委：2014-2019
- ✧ 英国皇家化学会《Natural Product Reports》顾问编委：2019-
- ✧ 《Synthetic and Systems Biotechnology》编委：2015-2020
- ✧ 《有机化学》编委：2007-
- ✧ 《中国抗生素杂志》编委：2006-
- ✧ 《合成生物学》编委 2020-

- ✧ 中国微生物学会分子微生物学与生物工程专业委员会，副主任委员：2011-2015；委员：2016-
- ✧ 中国药学会抗生素专业委员会 副主任委员：2015-
- ✧ 中国医药生物技术协会酶工程与发酵工程专业委员会，常务委员：2011-
- ✧ 中国微生物学会分子生物学专业委员会，委员：2010-
- ✧ 中国化学会化学生物学专业委员会，副主任委员：2010-2015；委员：2016-
- ✧ 中国化学会有机化学学科专业委员会，委员：2018

承担科研项目情况

- ✧ 国家自然科学基金重大项目（22193070），天然产物来源药物的生物合成与分子创新，2022 年 01 月-2026 年 12 月，项目负责人
- ✧ 国家重点研发计划“病原学与防疫技术体系研究”重点专项（2022YFC2303100），生物合成研究驱动的新型微生物抗感染药物创制，2022 年 12 月-2025 年 11 月，项目负责人
- ✧ 国家自然科学基金重点项目（32030002），富硫细菌环肽类代谢产物的翻译后修饰、调控机制以及结构与功能的多样性研究，2021 年 01 月-2025 年 12 月，项目负责人
- ✧ 国家自然科学基金应急管理项目（21750004），大环天然产物的模板化生物合成及其活性与结构导向的分子创新研究，2018 年 01 月-2020 年 12 月，项目负责人
- ✧ 国家自然科学国际(地区)合作与交流重点项目（21520102004），以多样性为导向的天然产物生物合成研究，2016 年 01 月-2020 年 12 月，项目负责人
- ✧ 国家自然科学基金重点项目（31430005），以活性（抗肿瘤和抗感染）与作用机制研究为导向的硫肽类抗生素的生物合成，2015 年 01 月-2019 年 12 月，项目负责人
- ✧ 国家自然科学基金重点项目（20832009），天然产物独特结构单元的生物合成机制研究，2009 年 01 月-2012 年 12 月，项目负责人

代表性论文

1. Yao Qian#, Jinmin Gao#, Ming Chen, Bo Pang, Zhijun Tang, Wei Huang, **Wen Liu***. Analysis of siderochelin biosynthesis reveals that a type II polyketide synthase catalyses diketide formation. *Nature Synthesis* **2025**, *4*(2), 219–232.
2. Yijiao Xiong, Heng Guo, **Wen Liu***. Unveiling the biosynthetic logic of nosiheptide based on reconstitution of its bicyclic thiopeptide scaffold. *Journal of the American Chemical Society* **2025**, *147*(18), 15847-15858.
3. Hanxin Song#, Zeliang Zhang#, Chunyang Cao*, Zhijun Tang*, Jinghan Gui*, **Wen Liu***. Biocatalytic steroidal 9α-hydroxylation and fragmentation enable the concise chemoenzymatic synthesis of 9,10-secosteroids. *Angewandte Chemie-International Edition* **2024**, *63*(16), e202319624.
4. Botao Cheng#, Jiwu Huang#, Yuting Duan, **Wen Liu***. Association of radical chemistry with LanD flavoprotein activity for *C*-terminal macrocyclization of a ribosomal peptide through the formation of an unsaturated thioether residue. *Angewandte Chemie-International Edition* **2023**, *62*(35), e202308733.
5. Zhijun Tang#, Bo Pang#, Chang Liu#, Shengjie Guo, Xudong Qu, **Wen Liu***. Formation and loading of a (*2S*)-2-ethylmalonamyl starter unit in the assembly line of polyketide-nonribosomal peptide hybrid sanglifehrin A. *Angewandte Chemie-International Edition* **2023**, *62*(23), e202217090.
6. Hongbo Wang#, Yike Zou#, Miao Li#, Zhijun Tang#, Jiabao Wang, Zhenhua Tian, Nina Strassner, Qian Yang, Qingfei Zheng, Yujiao Guo, **Wen Liu***, Lifeng Pan*, K. N. Houk*. A cyclase that catalyses competing 2 + 2 and 4 + 2 cycloadditions. *Nature Chemistry* **2023**, *15*(2), 177-184.
7. Yiyuan Cheng, Xuan Yi, Yan Zhang, Qingli He, Dandan Chen, Weiguo Cao, Pengfei Fang*, **Wen Liu***. Oxidase heterotetramer completes 1？azabicyclo[3.1.0]hexane formation with the association of a nonribosomal peptide synthetase. *Journal of the American Chemical Society* **2023**, *145*(16), 8896-8907.
8. Yanqing Xue#, Xiaofeng Wang#, **Wen Liu***. Reconstitution of the linaridin pathway provides access to the family-determining activity of two membrane-associated proteins in the formation of structurally underestimated cypemycin. *Journal of the American Chemical Society* **2023**, *145*(12), 7040-7047.
9. Shengjie Guo, Yueqian Sang, Chao Zheng, Xiao-Song Xue, Zhijun Tang*, **Wen Liu***. Enzymatic α-ketothioester decarbonylation occurs in the assembly line of barbamide for skeleton editing. *Journal of the American Chemical Society* **2023**, *145*(9), 5017-5028.
10. Ling Hu, Yi Qiao, Jingyu Liu, Chao Zheng, Xiaofeng Wang, Peng Sun, Yucheng Gu, **Wen Liu***. Characterization of histidine functionalization and its timing in the biosynthesis of ribosomally synthesized and posttranslationally modified thioamitides. *Journal of the American Chemical Society* **2022**, *144*(10), 4431-4438.
11. Bo Li, Xingyi Guan, Song Yang, Yike Zou, **Wen Liu***, K. N. Houk*. Mechanism of the stereoselective catalysis of Diels？Alderase PyrE3 involved in pyrroindomycin biosynthesis. *Journal of the American Chemical Society* **2022**, *144*(11), 5099-5107.
12. Sili Wang, Yiyuan Cheng, Xiaofeng Wang, Qian Yang, **Wen Liu***. Tracing of acyl carrier protein-channeled mitomycin intermediates in *Streptomyces caespitosus* facilitates characterization of the biosynthetic steps for AHBA？GlcN formation and processing. *Journal of the American Chemical Society* **2022**, *144*(33), 14945-14956.
13. Zhi Lin#, Yufeng Xue#, Xiao-Wei Liang, Jian Wang, Shuangjun Lin, Jiang Tao, Shu-Li You*, **Wen Liu***. Oxidative indole dearomatization for asymmetric furoindoline synthesis by a flavin-dependent

monooxygenase involved in the biosynthesis of bicyclic thiopeptide thiostrepton. *Angewandte Chemie-International Edition* **2021**, *60*(15), 8401-8405.

14. Bo Pang#, Rijing Liao#, Zhijun Tang#, Shengjie Guo, Zhuhua Wu, **Wen Liu***. Caerulomycin and collismycin antibiotics share a trans-acting flavoprotein-dependent assembly line for 2,2'-bipyridine formation. *Nature Communications* **2021**, *12*, 3124.
15. Botao Cheng#, Heng Guo#, Haoyang Wang, Qunfei Zhao, **Wen Liu***. Dissection of the enzymatic process for forming a central imidazopiperidine heterocycle in the biosynthesis of a series c thiopeptide antibiotic. *Journal of the American Chemical Society* **2021**, *143*(34), 13790-13797.
16. Zhijun Tang#; Haoyu Tang#, Wanqiu Wang#, Yufeng Xue, Dandan Chen, Weihua Tang*, **Wen Liu***. Biosynthesis of a new fusaoctaxin virulence factor in *Fusarium graminearum* relies on a distinct path to form a guanidinoacetyl starter unit priming nonribosomal octapeptidyl assembly. *Journal of the American Chemical Society* **2021**, *143*(47), 19719-19730.
17. Yanping Qiu#, Jingyu Liu#, Yuping Li, Yanqing Xue, **Wen Liu***. Formation of an aminovinyl-cysteine residue in thioviridamides occurs through a path independent of known lanthionine synthetase activity. *Cell Chemical Biology* **2021**, *28*(5), 675-685.
18. Yanan Du#, Yanping Qu#, Xiang Meng, Junyin Feng, Jiang Tao, **Wen Liu***. A heterotrimeric dehydrogenase complex functions with 2 distinct YcaO proteins to install 5 azole heterocycles into 35-membered sulfomycin thiopeptides. *Journal of the American Chemical Society* **2020**, *142*(18), 8454-8463.
19. Yike Zou, Song Yang, Jacob N. Sanders, Wei Li, Peiyuan Yu, Hongbo Wang, Zhijun Tang, **Wen Liu***, K. N. Houk*. Computational investigation of the mechanism of Diels-Alderase PyrI4. *Journal of the American Chemical Society* **2020**, *142*(47), 20232-20239.
20. Daozhong Zhang, Fang Zhang, **Wen Liu***. A KAS-III heterodimer in lipstatin biosynthesis nondecarboxylatively condenses C8 and C14 fatty acyl-CoA substrates by a variable mechanism during the establishment of a C22 aliphatic skeleton. *Journal of the American Chemical Society* **2019**, *141*(9), 3993-4001.
21. Daozhong Zhang, Zhijun Tang, **Wen Liu***. Biosynthesis of lincosamide antibiotics: reactions associated with degradation and detoxification pathways play a constructive role. *Accounts of Chemical Research* **2018**, *51*(6), 1496-1506.
22. Qingfei Zheng#, Yukang Gong#, Yujiao Guo, Zhixiong Zhao, Zhuhua Wu, Zixuan Zhou, Dandan Chen, Lifeng Pan*, **Wen Liu***. Structural insights into a flavin-dependent [4+2] cyclase that catalyzes trans-decalin formation in pyrroindomycin biosynthesis. *Cell Chemical Biology* **2018**, *25*(6), 718-727.
23. Jingjing Li, Yue Li, Guoqing Niu, Heng Guo, Yanping Qiu, Zhi Lin, **Wen Liu***, Huarong Tan*. NosP-regulated nosiheptide production responds to both peptidyl and small-molecule ligands derived from the precursor peptide. *Cell Chemical Biology* **2018**, *25*(2), 143-153.
24. Guannan Zhong, Qunfei Zhao, Qinling Zhang, **Wen Liu***. 4-Alkyl-L-(dehydro)proline biosynthesis in actinobacteria involves *N*-terminal nucleophile-hydrolase activity of γ-glutamyltranspeptidase homolog for C-C bond cleavage. *Nature Communications* **2017**, *8*, 16109.
25. Zhi Lin, Jia Ji, Shuaixiang Zhou, Fang Zhang, Jiequn Wu, Yinlong Guo, **Wen Liu***. Processing 2-methyl-L-tryptophan through tandem transamination and selective oxygenation initiates indole ring expansion in the biosynthesis of thiostrepton. *Journal of the American Chemical Society* **2017**, *139*(35), 12105-12108.
26. Yanping Qiu#, Yanan Du#, Fang Zhang, Rijing Liao, Shuaixiang Zhou, Chao Peng, Yinlong Guo, **Wen Liu***. Thiolation protein-based transfer of indolyl to a ribosomally synthesized

polythiazolyl peptide intermediate during the biosynthesis of the side ring system of nosiheptide. *Journal of the American Chemical Society* **2017**, *139*(50), 18186-18189.

27. Zhi Lin, Qingli He, **Wen Liu***. Bio-inspired engineering of thiopeptide antibiotics advances the expansion of molecular diversity and utility. *Current Opinion in Biotechnology* **2017**, *48*, 210-219.
28. Qingfei Zheng#, Shoufeng Wang#, Panpan Duan, Rijing Liao, Dandan Chen, **Wen Liu***. An α/β-hydrolase fold protein in the biosynthesis of thiostrepton exhibits a dual activity for endopeptidyl hydrolysis and epoxide ring opening/macrocyclization. *Proceedings of the National Academy of Sciences of the United States of America* **2016**, *113*(50), 14318-14323.
29. Bo Pang#, Min Wang#, **Wen Liu***. Cyclization of polyketides and non-ribosomal peptides on and off their assembly lines. *Natural Product Reports* **2016**, *33*(2), 162-173.
30. Qingfei Zheng#, Yujiao Guo#, Linlin Yang, Zhixiong Zhao, Zhuhua Wu, Hua Zhang, Jianping Liu, Xiaofang Cheng, Jiequn Wu, Huaiyu Yang, Hualiang Jiang, Lifeng Pan*, **Wen Liu***. Enzyme-dependent [4+2] cycloaddition depends on lid-like interaction of the *N*-terminal sequence with the catalytic core in PyrI4. *Cell Chemical Biology* **2016**, *23*(3), 352-360.
31. Qingfei Zheng, Zhenhua Tian, **Wen Liu***. Recent advances in understanding the enzymatic reactions of [4+2] cycloaddition and spiroketalization. *Current Opinion in Chemical Biology* **2016**, *31*, 95-102.
32. Qunfei Zhao#, Min Wang#, Dongxiao Xu, Qinglin Zhang, **Wen Liu***. Metabolic coupling of two small-molecule thiols programs the biosynthesis of lincomycin A. *Nature* **2015**, *518*(7537), 115-119.
33. Zhenhua Tian#, Peng Sun#, Yan Yan#, Zhuhua Wu, Qingfei Zheng, Shuaixiang Zhou, Hua Zhang, Futao Yu, Xinying Jia, Dandan Chen, Attila Mándi, Tibor Kurtán, **Wen Liu***. An enzymatic [4+2] cyclization cascade creates the pentacyclic core of pyrroindomycins. *Nature Chemical Biology* **2015**, *11*(4), 259-265.
34. Qingfei Zheng#, Qinglan Wang#, Shoufeng Wang#, Jiequn Wu, Qian Gao*, **Wen Liu***. Thiopeptide antibiotics exhibit a dual mode of action against intracellular pathogens by affecting both host and microbe. *Chemistry & Biology* **2015**, *22*(8), 1002-1007.
35. Yan Yan, Jing Chen, Lihan Zhang, Qingfei Zheng, Ying Han, Hua Zhang, Daozhong Zhang, Takayoshi Awakawa, Ikuro Abe, **Wen Liu***. Multiplexing of combinatorial chemistry in antimycin biosynthesis: expansion of molecular diversity and utility. *Angewandte Chemie-International Edition* **2013**, *52*(47), 12308-12312.
36. Peng Sun, Qunfei Zhao, Futao Yu, Hua Zhang, Zhuhua Wu, Yinyan Wang, Yan Wang, Qinglin Zhang, **Wen Liu***. Spiroketal formation and modification in avermectin biosynthesis involves a dual activity of AveC. *Journal of the American Chemical Society* **2013**, *135*(4), 1540-1548.
37. Qi Zhang, **Wen Liu***. Biosynthesis of thiopeptide antibiotics and their pathway engineering. *Natural Product Reports* **2013**, *30*(2), 218-226.
38. Shoufeng Wang, Shuaixiang Zhou, **Wen Liu***. Opportunities and challenges from current investigations into the biosynthetic logic of nosiheptide-represented thiopeptide antibiotics. *Current Opinion in Chemical Biology* **2013**, *17*(4), 626-634.
39. Qiongqiong Wu, Zhuhua Wu, Xudong Qu*, **Wen Liu***. Insights into pyrroindomycin biosynthesis reveal a uniform paradigm for tetramate/tetronate formation. *Journal of the American Chemical Society* **2012**, *134*(42), 17342-17345.
40. Xudong Qu*, Bo Pang, Zhicong Zhang, Ming Chen, Zhuhua Wu, Qunfei Zhao, Qinglin Zhang, Yinyan Wang, Yun Liu, **Wen Liu***. Caerulomycins and collismycins share a common paradigm for 2,2'-bipyridine biosynthesis via an unusual hybrid polyketide-peptide assembly logic. *Journal of the American Chemical Society* **2012**, *134*(22), 9038-9041.

41. Qi Zhang, Wilfred A. van der Donk, **Wen Liu***. Radical-mediated enzymatic methylation: a tale of two SAMS. *Accounts of Chemical Research* **2012**, *45*(4), 555-564.
42. Lian Duan#, Shoufeng Wang#, Rijing Liao, **Wen Liu***. Insights into quinaldic acid formation in thiostrepton biosynthesis facilitating fluorinated thiopeptide generation. *Chemistry & Biology* **2012**, *19*(4), 443-448.
43. Xudong Qu, Chun Lei, **Wen Liu***. Transcriptome mining of active biosynthetic pathways and their associated products in *Streptomyces flaveolus*. *Angewandte Chemie-International Edition* **2011**, *50*(41), 9651-9654.
44. Qi Zhang, Yuxue Li, Dandan Chen, Yi Yu, Lian Duan, Ben Shen, **Wen Liu***. Radical-mediated enzymatic carbon chain fragmentation-recombination. *Nature Chemical Biology* **2011**, *7*(3), 154-160.
45. Rijing Liao, **Wen Liu***. Thiostrepton maturation involving a deesterification-amidation way to process the *C*-terminally methylated peptide backbone. *Journal of the American Chemical Society* **2011**, *133*(9), 2852-2855.
46. Yi Yu, Heng Guo, Qi Zhang, Lian Duan, Ying Ding, Rijing Liao, Chun Lei, Ben Shen, **Wen Liu***. NosA catalyzing carboxyl-terminal amide formation in nosiheptide maturation via an enamine dealkylation on the serine-extended precursor peptide. *Journal of the American Chemical Society* **2010**, *132*(46), 16324-16326.
47. Wei Ding, Chun Lei, Qingli He, Qinglin Zhang, Yurong Bi, **Wen Liu***. Insights into bacterial 6-methylsalicylic acid synthase and its engineering to orsellinic acid synthase for spirotetronate generation. *Chemistry & Biology* **2010**, *17*(5), 495-503.
48. Rijing Liao, Lian Duan, Chun Lei, Haixue Pan, Ying Ding, Qi Zhang, Daijie Chen, Ben Shen, Yi Yu*, **Wen Liu***. Thiopeptide biosynthesis featuring ribosomally synthesized precursor peptides and conserved posttranslational modifications. *Chemistry & Biology* **2009**, *16*(2), 141-147.
49. Qunfei Zhao, Qingli He, Wei Ding, Mancheng Tang, Qianjin Kang, Yi Yu, Wei Deng, Qi Zhang, Jie Fang, Gongli Tang, **Wen Liu***. Characterization of the azinomycin B biosynthetic gene cluster revealing a different iterative type I polyketide synthase for naphthoate biosynthesis. *Chemistry & Biology* **2008**, *15*(7), 693-705.
50. Xin-Ying Jia, Zhen-Hua Tian, Lei Shao, Xu-Dong Qu, Qun-Fei Zhao, Jian Tang, Gong-Li Tang*, **Wen Liu***. Genetic characterization of the chlorothricin gene cluster as a model for spirotetronate antibiotic biosynthesis. *Chemistry & Biology* **2006**, *13*(6), 575-585.