Junzhe Wang

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Professional Summary

Skilled synthetic chemist with extensive experience in computer-aided drug design, small-molecule synthesis, lead compound optimization, and preclinical research. Expertise spans organic synthesis, medicinal chemistry, carbohydrate chemistry, and biochemical assays.

Education

Ph.D. in Organic Chemistry (Natural Product Total Synthesis & Chemical Biology)
Institute of Chemistry, Chinese Academy of Sciences, Beijing, China
Sep 2017 – Jan 2023 Advisor: Prof. Chuyi Yu

B.S. in Chemistry
College of Chemistry, Zhengzhou University, Zhengzhou, China
Sep 2012 – Jun 2016 Advisor: Prof. Shuangquan Zang

Research Experience

Postdoctoral Fellow
Wayne State University, Detroit, MI Sep 2024 – Present

- Design and synthesis of heparin mimetics.
- Preclinical evaluation of novel candidates for Type 1 diabetes, pancreatic cancer, and Marfan syndrome.

Postdoctoral Fellow
Purdue University, West Lafayette, IN Sep 2023 – Sep 2024

- Transition metal-catalyzed C2-functionalization of carbohydrates under photo-redox conditions.

Research Assistant
Institute of Chemistry, Chinese Academy of Sciences Jan 2023 – Sep 2023

- Design and synthesis of iminosugar derivatives.

Key Research Projects

- **α-Glucosidase Inhibitors**: Designed and synthesized DAB/LAB derivatives with aryl substitution at C-4 using molecular docking; compounds showed potent and selective inhibitory activity.
- **β-Glucosidase Inhibitors**: Developed nanomolar inhibitors using tartaric acid-derived nitrones; showed promising selectivity for lysosomal β-glucosidase (potential Gaucher disease treatment).
- **Total Synthesis of Castanospermine**: Studied fluorinated analogs via 3D-QSAR and docking; established efficient synthetic strategies for structure-activity relationship studies.
- **C-2 Functionalization of Sugars**: Developed C-2 alkyne and acyl derivatives via radical migration and transition-metal catalysis.
- **Heparin Mimetic Design & Evaluation**: Combined computational design and synthesis of amphiphilic sulfated molecules for T1D and cancer models (in vitro/in vivo studies).

Technical Skills

- **Analytical Techniques**: NMR (^{1}H, ^{13}C, ^{19}F, DEPT, NOESY, COSY, HSQC, HMQC), IR, MS, UPLC, GC, GC-MS
- **Modeling & Docking**: Gaussian 16, Surflex-Dock, PyMOL
- **Chemistry Expertise**: Organic synthesis, medicinal chemistry, carbohydrate chemistry
- **Biological Assays**: cell culture, qPCR, Western Blotting, IF/IHC staining, ELISA

Conferences & Presentations

- **Wang, J.-Z.**, *Therapeutic Potential of Sulfated and Hydrophobic Paromomycin Ligands for Type 1 Diabetes under the Challenge of Upregulated Heparanase*, Oral Presentation, **Carbohydrates Gordon Research Conference**, Holderness School, 33 Chapel Lane, Holderness, NH, USA, June 2025.

Publications

1. Wang, J.-Z.; Cheng, B.; Kato, A.; Kise, M.; Shimadate, Y.; Jia, Y.-M.; Li, Y.-X.; Fleet, G. W. J.; Yu, C.-Y. *Eur. J. Med. Chem.* 2022, **233**, 114230.
2. Wang, J.-Z.; Shimadate, Y.; Kise, M.; Kato, A.; Jia, Y.-M.; Li, Y.-X.; Fleet, G. W. J.; Yu, C.-Y. *Eur. J. Med. Chem.* 2022, **238**, 114499.
3. Li, Y.-X.[1]; Wang, J.-Z.[1]; Shimadate, Y.; Kise, M.; Kato, A.; Jia, Y.-M.; Fleet, G. W. J.; Yu, C.-Y. *Eur. J. Med. Chem.* 2022, **244**. (co-author)
4. Li, Y.-X.[1]; Wang, J.-Z.[1]; Shimadate, Y.; Kise, M.; Kato, A.; Jia, Y.-M.; Fleet, G. W. J.; Yu, C.-Y. *J. Org. Chem.* 2022, **87**, 7291. (co-author)
5. Li, Y.-X.; Wang, J.-Z.; Kato, A.; Shimadate, Y.; Kise, M.; Jia, Y.-M.; Fleet, G. W. J.; Yu, C.-Y. *Org. Biomol. Chem.* 2021, **19**, 9410.
6. Lu, T.-T.; Shimadate, Y.; Cheng, B.; Kanekiyo, U.; Kato, A.; Wang, J.-Z.; Li, Y.-X.; Jia, Y.-M.; Fleet, G. W. J.; Yu, C.-Y. *Eur. J. Med. Chem.* 2021, **224**, 113716.
7. Zi, D.; Song, Y.-Y.; Lu, T.-T.; Maki Kise; Atsushi Kato; Wang, J.-Z.; Jia, Y.-M.; Li, Y.-X.; Fleet, G. W. J.; Yu, C.-Y. *Eur. J. Med. Chem.* 2022, 115056.
8. Dong, X.-Y.; Wang, R.; Wang, J.-Z.; Zang, S.-Q.; Mak, T. C. W. *J. Mater. Chem. A* 2015, **3**, 641.
9. Zi, D.; Shimadate, Y.; Wang, J.-Z.; Kato, A.; Li, Y.-X.; Jia, Y.-M.; Fleet, G. W. J.; Yu, C.-Y. *Org. Biomol. Chem.* 2023, **21**, 2729–2741.
10. Li, Y.-X.; Zhang, M.; Shimadate, Y.; Kato, A.; Wang, J.-Z.; Jia, Y.-M.; Fleet, G. W. J.; Yu, C.-Y. *Org. Biomol. Chem.* 2025, **23**, 2854–2877.

Patent

- Yu, C.-Y.; Wang, J.-Z.; Li, Y.-X.; Jia, Y.-M. “Compounds with Glycosidase Inhibitory Activity and Their Applications.” **CN116199610B**