# Activity-based protein profiling of glucosidases, fucosidases and glucuronidases

Jiang, J.

# Curriculum vitae

Jianbing Jiang was born on 1st August 1985 in Liaocheng, Shaodong, China. When he was in high school, he joined the Chinese chemistry and biology Olympiad, which stimulated his interest in subjects of chemistry and biology. After taking the National College Entrance Examination in 2004, he entered Yantai University and obtained his bachelor degree of biotechnology in 2008. Thereafter, he moved to Lanzhou University for his master study in the field of biochemistry. In 2011, he obtained his master degree with the thesis 'Collagen model peptides labeling and their triple helices folding/unfolding analysis' under the supervision of Prof. Dr. Shouliang Dong.

From September 2011 to June 2016, he studied in the group of Bio-organic Synthesis in Leiden University as a PhD student under supervision of Prof. Dr. Herman S. Overkleeft and Prof. Dr. Johannes M. F. G. Aerts. The author conducted research in the field of chemical glycobiology and was supported by the China Scholarship Council (CSC). During his PhD study, he developed new generations of activity-based probes for the study of several retaining glycosidases. Parts of his work was orally presented at the CHEMPROBE-COST Meeting (Cambridge, 2014), the CHAINS-Dutch chemistry conference (Veldhoven, 2014) and the 18th European Carbohydrate Symposium (Moscow, 2015), and as poster prtersentations at the 4th and 5th EMBO Chemical Biology meeting (Heidelberg, 2012 and 2014). The author also participated in the AIMMS Post-Graduate Course of chemical biology/medicinal chemistry (Amsterdam, 2011) and the HRSMC summer school 'New vistas for organic synthesis' (Maastricht, 2013).

# List of publications

1. *Exo*- and *endo*-retaining β-glucuronidases activities and mechanisms revealed by cyclophellitol aziridine-based inhibitors and probes.
   **Jiang, J.**, Wu, L., Jin, Y., Kallemeijn, W. W., Kuo, C. L., Dai, W., van Elk, C., van der Marel, G. A., Codée, J. D. C., Florea, B. I., van den Elst, H., van Eijk, M. C., Aerts, J. M. F. G., Overkleeft, H. S., and Davies, G. J. **2016**, manuscript in preparation.

2. Synthesis and biological evaluation of glucuronide-configured cyclophellitol and cyclophellitol aziridine based β-glucuronidase inhibitors and probes
   **Jiang, J.**, Jin, Y., Kallemeijn, W. W., van Elk, C., van der Marel, G. A., Codée, J. D. C., Aerts, J. M. F. G., Davies, G. J., and Overkleeft, H. S. **2016**, manuscript in preparation.

3. Detection of active mammalian GH31 α-glucosidases in health and disease using in-class, broad spectrum activity-based probes.
   **Jiang, J.**, Kuo, C.-L., Wu, L., Franke, C., Kallemeijn, W. W., Florea, B.I., van Meel, E., van der Marel, G. A., Codée, J. D. C., Boot, R. G., Gideon J. D., Overkleeft, H, S., and Aerts, J. M. F. G. *ACS Central Science*, **2016**, DOI:10.1021/acscentsci.6b00057.

4. Pharmacological chaperones stabilize glycosylceramidase through hydrophobic interactions.
   Bdira, B. F., **Jiang, J.**, Kallemeijn, W. W., Haan, A., Florea, B. I., Bleijlevens, B., Boot, R. G., Overkleeft, H. S., Aerts, J. M. F. G., and Ubbink, M, *Biochemistry,* **2016**, under review.

5. The synthesis of cyclophellitol aziridine and its configurational and functional isomers: a literature survey.
   **Jiang, J.**, Artola, M., Beenakker, T. J. M., Schröder, S. P., Petracca, R., De Boer, C., Aerts, J. M. F. G., van der Marel, G. A., Codée, J. D. C., and Overkleeft, H. S., *European Journal of Organic Chemistry,* **2016**, DOI:10.1021/ejoc.201600472.

6. Glucosyl epi-cyclophellitol allows mechanism-based inactivation and structural analysis of human pancreatic alpha-amylase.
   Caner, S., Zhang, X., **Jiang, J**., Chen, H.-M., Nguyen, N. T., Overkleeft, H. S., Brayer, G. D., and Withers, S. G. *FEBS Letters*, **2016**, 590(8): 1143-1151.

7. Chemoenzymatic synthesis of 6-phospho-cyclophellitol as a novel probe of 6-phospho-β-glucosidases.
   Kwan, D. H., Jin, Y. **Jiang, J.**, Chen, H.-M., Kötzler, M. P., Overkleeft, H. S. Davies, G. J., and Withers, S.G. *FEBS Letters,* **2016**, 590(4): 461-468.

8. Comparing cyclophellitol N-alkyl and N-acyl cyclophellitol aziridines as activity-based glycosidase probes.
**Jiang, J.**, Beenakker, T. J. M., Kallemeijn, W. W., van der Marel, G. A., van den Elst, H., Codée, J. D. C., Aerts J. M. F. G., and Overkleeft, H. S. *Chemistry – A European Journal,* **2015**. 6(5): 2782-2789.

9. *In vitro* and *in vivo* comparative and competitive activity-based protein profiling of GH29 alpha-L-fucosidases.
**Jiang, J.**, Kallemeijn, W. W., Wright, D. W., van den Nieuwendijk, A. M. C. H., Rohde, V. C., Folch, E. C., van den Elst, H., Florea, B. I., Scheij, S., Donker-Koopman, W. E., Verhoek, M., Li, N., Schurmann, M., Mink, D., Boot, R. G., Codée, J. D. C., van der Marel, G. A., Davies, G. J., Aerts, J. M. F. G., and Overkleeft, H. S. *Chemical Science,* **2015**, 21(30): 10861-10869.

10. Synthesis of cyclophellitol, cyclophellitol aziridine, and their tagged derivatives.
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11. Exploring functional cyclophellitol analogues as human retaining beta-glucosidase inhibitors.
Li, K. Y., **Jiang, J.**, Witte, M. D., Kallemeijn, W. W., Donker-Koopman, W. E., Boot, R. G., Aerts, J. M. F. G., Codée, J. D. C., van der Marel, G. A., and Overkleeft, H. S. *Organic & Biomolecular Chemistry,* **2014**, 12(39): 7786-7791.

12. From covalent glycosidases to activity-based glycosidase probes.
Willems, L. I., **Jiang, J**. Li, K. Y., Witte, M. D., Kallemeijn, W. W., Beenakker, T. J., Schroder, S. P., Aerts, J. M., van der Marel, G. A., Codée, J. D., and Overkleeft, H. S. *Chemistry – A European Journal,* **2014**, 20(35): 10864-10872.

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14. Broad-range glycosidase activity profiling.
Chandrasekar, B., Colby, T., Emon, A. E. K., **Jiang, J**., Hong, T. N., Villamor, J. G., Harzen, A., Overkleeft, H. S., and van der Hoorn, R. A. L. *Molecular & Cellular Proteomics,* **2014**, 13(10): 2787-2800.

15. Site-directed spin labeling of a collagen mimetic peptide.
**Jiang, J.,** L. Yang, Jin, Q., Ma, W., Moroder, L., and Dong, S. *Chemistry – A European Journal*, **2013**, 19(52): 17679-17682.

16. Novel activity-based probes for broad-spectrum profiling of retaining beta-exoglucosidases *in situ* and *in vivo*.
Kallemeijn, W. W., Li, K. Y., Witte, M. D., Marques, A. R., Aten, J., Scheij, S., **Jiang, J.**, Willems, L. I., Voorn-Brouwer, T. M., van Roomen, C. P., Ottenhoff, R., Boot, R. G., van den Elst, H., Walvoort, M. T., Florea, B. I., Codée, J. D., van der Marel, G. A., Aerts, J. M., and Overkleeft, H. S. *Angewandte Chemie International Edition,* **2012**, 51(50): 12529-12533.