Metabolomics insight into the gut microbiome of infants with cow's milk allergy

Zhu, P.

Curriculum vitae

Pingping Zhu was born on May 25th, 1992, in Fuling, Chongqing, China. After graduating from No.5 High School of Fuling in 2011, she was admitted to Chongqing Medical University for a five-year bachelor's program majoring in Clinical Pharmacy. In 2016, she obtained her bachelor's degree in clinical pharmacy with a minor in English (Medical English direction).

In the same year, she started her master's study at the West China School of Pharmacy, Sichuan University, China, where she was supervised by Prof. Ke Lan, focusing on studying the tertiary metabolism of deoxycholate in human and pre-clinical animal models. During the three-year study, she developed skills in the bioanalysis of small molecular using liquid chromatography – mass spectrometry and gained a strong interest in exploring the crosstalk between human host and gut microbiome through their mutual metabolism.

In September 2019, after obtaining her master's diploma, she continued her PhD journey at the Metabolomics and Analytical Center at Leiden University, under the supervision of Prof. Dr. Thomas Hankemeier, Dr. Amy Harms, and Dr. Anne-Charlotte Dubbelman. Her doctoral research began with the development and advancement of untargeted metabolomics methods using innovative techniques to address the problem of matrix effects. She then dedicated herself to deepening the understanding of the interplay between the gut microbiome and human health by exploring the fecal metabolome in infants with cow's milk allergy.

After her PhD, Pingping is currently working with Dr. Robert Jansen and Prof. dr. LA.M.P. van Niftrik in the Department of Microbiology at Radboud University. As a postdoctoral researcher, she pursues her interests further in identifying gut-microbial metabolite biomarkers for the early prediction of immunotherapy response in patients with non-small cell lung cancer.

List of Publications

Publications related to this thesis

1. **Zhu, P.**, Dubbelman, A. C., Hunter, C., Genangeli, M., Karu, N., Harms, A., & Hankemeier, T. (2024). Development of an untargeted LC-MS metabolomics method with post-column infusion for matrix effect monitoring in plasma and feces. *Journal of the American Society for Mass Spectrometry*, 35(3), 590-602.
2. **Zhu, P.,** Harms, A. C., Maas, P., Bakas, M., Whien, J. J., Dubbelman, A. C., & Hankemeier, T. (2025). Matrix Effects in Untargeted LC-MS Metabolomics: From Creation to Compensation with Post-Column Infusion of Standards. *Journal of Chromatography A*, 466508.
3. Savova, M. V.*, **Zhu, P.***, Harms, A. C., van Der Molen, R. G., Belzer, C., & Hendrickx, D. M. (2024). Current insights into cow's milk allergy in children: Microbiome, metabolome, and immune response—A systematic review. *Pediatric Allergy and Immunology*, 35(2), e14084.
4. **Zhu, P.***, Savova, M. V.*, Kindt, A., PRESTO Study Team, Wopereis, H., Belzer, C., ... & Hankemeier, T. (2025). Exploring the Fecal Metabolome in Infants with Cow's Milk Allergy: The Distinct Impacts of Cow's Milk Protein Tolerance Acquisition and of Synbiotic Supplementation. *Molecular Nutrition & Food Research*, 69(1), e202400583.

*Authors contributed equally

Other publications

1. Savova, M. V., **Zhu, P.**, Kindt, A., the TEMPO study team, Wopereis, H., Belzer, C., Harms, A. C., & Hankemeier, T.. Fecal metabolome alterations in infants at risk of developing allergies during the first year of life. (under submission)
2. Hendrickx, D. M., Savova, M. V., **Zhu, P.**, An, R., Boeren, S., Klomp, K., ... & Presto Study Team. (2025). A multi-omics machine learning classifier for outgrowth of cow's milk allergy in children. *Molecular Omics*.
3. **Zhu, P.**, Zhang, J., Chen, Y., Yin, S., Su, M., Xie, G., ... & Jia, W. (2018). Analysis of human C24 bile acids metabolome in serum and urine based on enzyme digestion

of conjugated bile acids and LC-MS determination of unconjugated bile acids. *Analytical and bioanalytical chemistry*, 410(21), 5287-5300.

4. Chen, Y. J., Zhang, J., **Zhu, P. P.**, Tan, X. W., Lin, Q. H., Wang, W. X., ... & Lan, K. (2019). Stereoselective oxidation kinetics of deoxycholate in recombinant and microsomal CYP3A enzymes: deoxycholate 19-hydroxylation is an in vitro marker of CYP3A7 activity. *Drug Metabolism and Disposition*, 47(6), 574-581.

5. Zhang, J., Gao, L. Z., Chen, Y. J., **Zhu, P. P.**, Yin, S. S., Su, M. M., ... & Lan, K. (2019). Continuum of host-gut microbial co-metabolism: host CYP3A4/3A7 are responsible for tertiary oxidations of deoxycholate species. *Drug Metabolism and Disposition*, 47(3), 283-294.

6. Gui, L., Wu, Q., Hu, Y., Zeng, W., Tan, X., **Zhu, P.**, ... & Lan, K. (2021). Compensatory transition of bile acid metabolism from fecal disposition of secondary bile acids to urinary excretion of primary bile acids underlies rifampicin-induced cholestasis in beagle dogs. *ACS Pharmacology & Translational Science*, 4(2), 1001-1013.

7. Zeng, W., Gui, L., Tan, X., **Zhu, P**., Hu, Y., Wu, Q., ... & Lan, K. (2021). Tertiary oxidation of deoxycholate is predictive of CYP3A activity in dogs. *Drug Metabolism and Disposition*, 49(5), 369-378.

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