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Investigating lipid formulations for efficient RNA delivery using zebrafish models

Bi, D.

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Curriculum vitae

Dongdong Bi was born on January 25th, 1994, in Hebei Province, China. In June 2016, she received her bachelor's degree from Beijing University of Chinese Medicine and was recognized as an Outstanding Graduate of the Class of 2016. Her undergraduate thesis focused on the extraction and purification of active compounds from traditional Chinese herbs. From September 2016 to June 2019, she pursued graduate studies at Tsinghua University and Peking Union Medical College in Beijing, China. During this time, she obtained a master's degree in Pharmaceutical Science, with research centered on the development of anti-tumor nanoparticles aimed at enhancing the therapeutic efficacy of chemotherapy drugs both *in vitro* and *in vivo*.

In September 2019, Dongdong moved to Leiden, the Netherlands, to begin her Ph.D. journey at Leiden University in the Division of BioTherapeutics, part of the Leiden Academic Centre for Drug Research (LACDR). She conducted her research under the supervision of Prof. Dr. Matthias Barz, Dr. Jeroen Bussmann, and Prof. Dr. Wim Jiskoot. Her research focuses on developing lipid-based formulations, such as liposomes and lipid nanoparticles, and studying the mechanisms that enhance nucleic acid delivery (mRNA/siRNA). She investigated polysarcosine as an alternative to PEG and explored peptides as targeting ligands, using zebrafish as an *in vivo* model to visualize RNA transfection effects. The results from this research are presented in this book.

In September 2024, Dongdong joined Lonza (Geleen, the Netherlands) as Associate Principal Scientist. She works in R&D team and focus on developing novel lipid formulations for mRNA delivery.

List of publications

1. **D. Bi**, C. Wilhelmy, D. Unthan, I. S. Keil, B. Zhao, B. Kolb, R. I. Koning, M. A. Graewert, B. Wouters, R. Zwier, J. Bussmann, T. Hankemeier, M. Diken, H. Haas, P. Langguth, M. Barz, H. Zhang, On the Influence of Fabrication Methods and Materials for mRNA-LNP Production: From Size and Morphology to Internal Structure and mRNA Delivery Performance In Vitro and In Vivo. *Adv. Healthcare Mater.* 2024, 13, 2401252.
2. **D. Bi**, A. Van Hal, D. Aschmann, M. Shen, H. Zhang, L. Su, G. Arias-Alpizar, A. Kros, M. Barz, J. Bussmann, Deconvolving Passive and Active Targeting of Liposomes Bearing LDL Receptor Binding Peptides Using the Zebrafish Embryo Model. *Small* 2024, 20, 2310781.
3. **D. Bi**, D. Mark Unthan, L. Hu, J. Bussmann, K. Remaut, M. Barz, H. Zhang, Polysarcosine-based lipid formulations for intracranial delivery of mRNA. *Journal of Controlled Release*, 2023, 356, 1-13.
4. Y. He, **D. Bi**, J.A. Plantinga, G. Molema, J. Bussmann, J.A.A.M. Kamps, Development of a Combined Lipid-Based Nanoparticle Formulation for Enhanced siRNA Delivery to Vascular Endothelial Cells. *Pharmaceutics* 2022, 14, 2086.
5. **D. Bi**, L. Zhao, H. Li, Y. Guo, X. Wang, M. Han, A comparative study of polydopamine modified and conventional chemical synthesis method in doxorubicin liposomes form the aspect of tumor targeted therapy. *International Journal of Pharmaceutics*, 2019, 559, 76-85.
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9. L. Zhao, **D. Bi**, X. Qi, Y. Guo, F. Yue, X. Wang and M. Han, Polydopamine-based surface modification of paclitaxel nanoparticles for osteosarcoma targeted therapy, *Nanotechnology*, 2019, 30, 255101.

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10. M. Han, X. Qi, D. Bi, Y. Li, Y. Guo, X. Wang, Li Feng, Administration of raloxifene hydrochloride nanosuspensions partially attenuates bone loss in ovariectomized mice. *RSC Advances*, 2018, 8, 23748-23756.
11. X. Qi, H. Liu, **D. Bi**, X. Wang, Y. Guo, T. Hao, B. Zhang, X. Wang, M. Han. Combined administration on You-Gui Yin and low-dose Raloxifene partially attenuates the bone loss in ovariectomized mice through the proliferation and osteogenic differentiation of bone marrow stromal cells. *Phytomedicine*, 2019, 53, 286-293.
12. H. Li, Y. Li, H. Ao, **D. Bi**, M. Han, Y. Guo, X. Wang, Folate-targeting annonaceous acetogenins nanosuspensions: significantly enhanced antitumor efficacy in HeLa tumor-bearing mice. *Drug Delivery*, 2018, 25(1), 880–887.
13. M. Han, Z. Li, D. Bi, Y. Guo, H. Kuang, X. Wang, Novel folate-targeted docetaxel-loaded nanoparticles for tumour targeting in vitro and in vivo evaluation, *RSC Advances*, 2016, 6, 64306-64314.

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