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Multilayer cancer glycomics

Wang, D.

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Curriculum vitae

Di Wang was born on June 10th 1991 in Xinxiang, China. After she finished her high school education, she enrolled in the bachelor Biological Engineering at the Life Science and Technology Institute at Xinxiang Medical University in 2011. After successfully obtaining her bachelor's degree, she started her masters' Biological Engineering at the National Glycoengineering Research Center at Shandong University from 2015 to 2018. During this time, she set her first step into the world of glycosylation under the supervision of Associate Prof. Yikang Shi, where she investigated the role of *O*-GlcNAcylation of proteins in the antitumor activity of platinum drugs *in vitro* and *in vivo*. Meantime, she studied the expression and location of p62 in *Escherichia coli* Origami2(DE3). She mastered various experimental skills including cell culturing, cell transfection, reverse transcription-PCR, western blotting, immunoprecipitation, flow cytometry and construction of a nude mouse tumor model.

After finishing her masters', she applied and was rewarded a scholarship of the Chinese Scholarship Council in 2018 to pursue a Ph.D. under the supervision of Prof. Manfred Wuhrer, Dr. Guinevere S.M. Lageveen-Kammeijer and Dr. Tao Zhang at the Center for Proteomics and Metabolomics (CPM) at Leiden University Medical Center (LUMC), the Netherlands. Her main topic focused on characterizing the glycomic profiles of colorectal cancer (CRC) and acute myeloid leukemia (AML) with the application of porous graphitized carbon (PGC) nano-liquid chromatography (LC) electrospray ionization tandem mass spectrometry (MS). The majority of this work is presented in this thesis.

Ph.D. portfolio

Disciplinary courses

- Ph.D. Introductory Meeting
- BROK Course- regulations for conducting clinical research in the Netherlands (BROK®)
- Basic Methods and Reasoning in Biostatistics
- Advanced Biomolecular Mass Spectrometry Course
- 13th Mass Spectrometry School in Biotechnology and Medicine (MSBM)
- Academic Writing for PhDs
- Data stewardship: handling data in all phases of research

Scientific contribution to conferences

Oral presentations

- *Combined PGC LC-MS/MS and mRNA expression analyses in acute myeloid leukemia cells delineates differential GSL glycans signatures.* 37th International Symposium on Microscale Separation and Bioanalysis (2021)

Poster presentations

- *The study of glycosphingolipid-glycans signatures in different human acute myeloid leukemia cell lines using PGC LC-MS/MS in negative mode.* 13th Mass Spectrometry School in Biotechnology and Medicine (MSBM), Dubrovnik, Croatia (2019)
- *Glycosphingolipid-glycan signatures of acute myeloid leukemia cell lines reflect hematopoietic differentiation.* NVMS Fall Meeting, Leiden, The Netherlands (2019)
- *Glycosphingolipid-glycans signatures of different human acute myeloid leukemia cell lines explored by PGC LC-MS/MS.* Society for Glycobiology Virtual Annual Meeting conference (2020)
- *High Diversity of Glycosphingolipid Glycans of Colorectal Cancer Cell Lines Reflects the Cellular Differentiation Phenotype.* International Mass Spectrometry Conference (IMSC). Maastricht, The Netherlands (2022)

Congress attendance

- Global CESI-MS Symposium, Leiden, The Netherlands (2018)
- 29th Joint Glycobiology, 2018, Ghent, Belgium (2018)
- Symposium: 'Glyco-science and its medical implications', Amsterdam, The Netherlands (2019)
- e-NVMS Meeting - Part I (2021)
- e-NVMS meeting on Covid-19 Research - Part II (2021)

List of publications

- 1. In-depth analysis of the *N*-glycome of colorectal cancer cell lines**
Di Wang[#], Valeriia Kuzyk[#], Katarina Madunić, Tao Zhang, Oleg A. Mayboroda, Manfred Wuhrer, Guinevere S.M. Lageveen-Kammeijer
[#] contributed equally
Int J Mol Sci, 2023. 24(5) (Chapter 2)
- 2. High diversity of glycosphingolipid glycans of colorectal cancer cell lines reflects the cellular differentiation phenotype**
Di Wang, Katarina Madunić, Tao Zhang, Oleg A Mayboroda, Guinevere S M Lageveen-Kammeijer, Manfred Wuhrer
Mol Cell Proteomics, 2022. 21(6): p. 100239 (Chapter 3)
- 3. Transcriptional signature of (sialyl)Lewis expression across *N*-, *O*- and GSL glycans in differentiated colorectal cancer cell lines**
Di Wang, Katarina Madunić, Oleg A. Mayboroda, Guinevere S.M. Lageveen-Kammeijer, and Manfred Wuhrer
Manuscript submitted (Chapter 4)
- 4. Profound Diversity of the *N*-Glycome from Microdissected Regions of Colorectal Cancer, Stroma, and Normal Colon Mucosa**
Di Wang[#], Katarina Madunić[#], Tao Zhang, Guinevere SM LageveenKammeijer, Manfred Wuhrer
[#] contributed equally
Engineering, 2022 (Chapter 5)
- 5. Glycosphingolipid-glycan signatures of acute myeloid leukemia cell lines reflect hematopoietic differentiation**
Di Wang, Tao Zhang, Katarina Madunić, Antonius A. de Waard, Constantin Blöchl, Oleg A. Mayboroda, Marieke Griffioen, Robbert M. Spaapen, Christian G. Huber, Guinevere S.M. Lageveen-Kammeijer, and Manfred Wuhrer
J Proteome Res, 2022. 21(4): p. 1029-1040 (Chapter 6)
- 6. Transcriptionally imprinted glycomic signatures of acute myeloid leukemia**
Constantin Blöchl[#], Di Wang[#], Oleg A. Mayboroda, Guinevere S.M. Lageveen-Kammeijer, and Manfred Wuhrer
[#] contributed equally
Cell Biosci, 2023. 13(1): p. 31 (Chapter 7)

7. **Cisplatin enhances protein O-GlcNAcylation by altering the activity of OGT, OGA and AMPK in human nonsmall cell lung cancer cells**
Di Wang[#], Jiaan Wu[#], Dandan Wang, Xiaoyan Huang, Naining Zhang and Yikang Shi
[#] contributed equally
Int J Oncol, 2021. 58(6)
8. **Integrated N- and O-glycomics of acute myeloid leukemia (AML) cell lines**
Constantin Blöchl, Di Wang, Katarina Madunić, Guinevere S. M. Lageveen-Kammeijer, Christian G. Huber, Manfred Wuhrer and Tao Zhang
Cells, 2021. 10(11)
9. **Tunicamycin potentiates paclitaxel-induced apoptosis through inhibition of PI3K/AKT and MAPK pathways in breast cancer**
Shengshi Huang, Di Wang, Shu Zhang, Xiaoyan Huang, Dandan Wang, Muhammad Ijaz, Yikang Shi
Cancer Chemother Pharmacol, 2017. 80(4): p. 685-696

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