

Bin Wang
Curriculum Vitae

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CURRENT POSITION

Marshall University, Huntington, WV, USA, Associate Professor of Chemistry

EDUCATION

INSTITUTION AND LOCATION	DEGREE	MM/YY	FIELD OF STUDY
Beijing Medical University, Beijing, China	B.S.	07/94	Pharmaceutical Chemistry
National University of Singapore, Singapore	M.S.	06/03	Pharmacy
Queen's University at Kingston, ON, Canada	Ph.D.	10/04	Analytical Chemistry
Queen's University at Kingston, ON, Canada	Postdoc	10/04–10/05	Biochemistry
University of North Carolina at Chapel Hill, NC, USA	Postdoc	11/05–06/07	Biochemistry

TEACHING EXPERIENCE

Queen's University at Kingston, ON, Canada, 2001–2004

Graduate Student Laboratory Teaching Assistant

- CHM 112/116 Introductory Chemistry
- CHM 271/278 Analytical Chemistry I
- CHM 279/379 Analytical Chemistry II
- CHM 213 Introduction to Analytical Chemistry
- CHM 221 Materials, Solutions, and Interfaces
- CHM 397 Experimental Chemistry

Marshall University, Huntington, WV, USA, 2007–present

Assistant Professor (2007–2013), Associate Professor (2013–present)

- CHM 111 Foundations of Chemistry
- CHM 211 Principles of Chemistry I
- CHM 212 Principles of Chemistry II
- CHM 217 Principles of Chem Lab I

- CHM 218 Principles of Chem Lab II
- CHM 345 Introduction to Analytical Chemistry
- CHM 401/402 Research for Undergraduates
- CHM 411/511 Modern Instrument Methods
- CHM 490 Internship
- CHM 491 Capstone Experience
- CHM 331/332/431/432/631/632 Seminar
- CHM 682 Research

RESEARCH EXPERIENCE

Beijing Research Institute of Pharmaceutical Industry, Beijing, China, Assistant Engineer of Chemistry, 1994–1999

- Developed analytical test methodologies and modified/enhanced the existing test methodologies for anticancer drugs and traditional Chinese medicines.
- Applied HPLC, GC, IR, UV-Vis, CE, Gel Electrophoresis, FPLC, MS, and NMR to identify, purify, and characterize synthetic and natural compounds.

National University of Singapore, Singapore, M.S. Student, 1999–2001

Advisors: Dr. Eli Wing Yuen Chan, Dr. T. R. Ramachandra Kurup

Thesis: *In Vitro* Pharmacodynamic Studies: Combinations of Antimicrobials Against *Escherichia coli* and *Staphylococcus aureus*

- Determined the effects of thirty combinations of antimicrobials against given pathogens using both checkerboard and time-kill methods.
- Determined the additive interactions between traditional Chinese herbal medicines and antibiotics.

Queen's University at Kingston, Kingston, ON, Canada, Ph.D. Student, 2001–2004

Advisor: Dr. Richard D. Oleschuk

Dissertation: Surface Modification and Characterization of Polymer Materials for Microfluidic Device Applications

- Developed polymer materials to fabricate microfluidic devices, and further modified the polymer surfaces with different functional groups for specific microfluidic applications.
- Characterized the modified polymer surfaces with standard electroosmotic flow measurements in addition to atomic force microscopy and chemical force titrations.

Queen's University's Cancer Research Institute, Kingston, ON, Canada, Postdoctoral Fellow, 2004–2005

Advisor: Dr. P. Martin Petkovich

- Cloned target DNA into two vectors (pGEX-3X and pSUMO), and over-expressed and purified the human CYP26A1 protein (retinoic acid metabolizing enzyme).
- Modified poly(methylmethacrylate) surfaces with antigens and antibodies to build biosensors and diagnostic devices.

University of North Carolina at Chapel Hill, Chapel Hill, NC, USA, Postdoctoral Fellow, 2005–2007

Advisor: Dr. Kevin M. Weeks

- Participated in the development of a high-throughput RNA structural analyzing technology: Selective 2'-hydroxyl acylation analyzed by primer extension (SHAPE).
- Applied the SHAPE technique to determine ligand-induced conformational changes in tRNA and mRNA monitored at single nucleotide resolution.

Marshall University, Huntington, WV, USA, Assistant Professor of Chemistry, 2007–2013, Associate Professor of Chemistry, 2013–present

- Apply RNA structure-analyzing technologies to investigate the specifics of the interactions between RNA and small molecules as well as RNA and proteins.
- Design and assemble RNA nanostructures for drug delivery.
- Study the effects of sex and advanced age on expression of molecules involved in iron metabolism and neurodegeneration in rat brains.
- Design and develop microfluidic devices for applications such as *in vitro* RNA transcription, determination of RNA structure, and endothelial cell culture.

SELECTED PUBLICATIONS

- Bin Wang, Zamin Abdulali-Kanji, Emily Dodwell, J. Hugh Horton, Richard D. Oleschuk, Surface characterization using chemical force microscopy and the flow performance of modified polydimethylsiloxane for microfluidic device applications, *Electrophoresis* **2003**, *24*, 1442–1450.
- Bin Wang, Lu Chen, Zamin Abdulali-Kanji, J. Hugh Horton, Richard D. Oleschuk, Aging effects on oxidized and amine-modified poly(dimethylsiloxane) surfaces studied with chemical force titrations: Effects on electroosmotic flow rate in microfluidic channels, *Langmuir* **2003**, *19*, 9792–9798.
- Bin Wang, Richard D. Oleschuk, J. Hugh Horton, Chemical force titrations of amine- and sulfonic acid-modified poly(dimethylsiloxane), *Langmuir* **2005**, *21*, 1290–1298.
- Bin Wang, J. Hugh Horton, Richard D. Oleschuk, Sulfonated-polydimethylsiloxane (PDMS) microdevices with enhanced electroosmotic pumping and stability, *Can. J. Chem.* **2006**, *84*, 720–729.
- Bin Wang, Richard D. Oleschuk, P. Martin Petkovich, J. Hugh Horton, Chemical force titrations of antigen- and antibody-modified poly(methylmethacrylate), *Coll. Surf. B: Biointerfaces* **2007**, *55*, 107–114.
- Bin Wang, Kevin A. Wilkinson, Kevin M. Weeks, Complex ligand-induced conformational changes in tRNA^{Asp} revealed by single-nucleotide resolution SHAPE chemistry, *Biochemistry* **2008**, *47*, 3454–3461.
- Miaozong Wu, Bin Wang, Jia Fei, Nalini Santanam, Eric R. Blough, Important roles of Akt/PKB signaling in the aging process, *Front. Biosci.* **2010**, *S2*, 1169–1188.
- Wallace Kunin, Navid Keshavarzian, Bin Wang, AutoCAD add-on for simplified design of microfluidic devices, *J. Comput. Chem. Jpn.* **2010**, *9*, 183–196.
- Hyun-Hee Cho, Catherine M. Cahill, Charles R. Vanderburg, Clemens R. Scherzer, Bin Wang, Xudong Huang, Jack T. Rogers, Selective translational control of the Alzheimer

amyloid precursor protein transcript by iron regulatory protein-1, *J. Biol. Chem.* **2010**, 285, 31217–31232. (cover story)

- Miaozong Wu, Jacqueline Fannin, Kevin M. Rice, Bin Wang, Eric R. Blough, Effect of aging on cellular mechanotransduction, *Ageing Res. Rev.* **2011**, 10, 1–15.
- Bin Wang, Nucleic acid nanobiomaterials, Chapter 10 in: *Nanobiomaterials Handbook*, edited by Balaji Sitharaman. Boca Raton: CRC Press, **2011**, pp 10–1 to 10–18.
- Srinivasarao Thulluri, Miaozong Wu, Eric R. Blough, Nandini D.P.K. Manne, Ashley B. Litchfield, Bin Wang, Regulation of iron-related molecules in the rat hippocampus: Sex- and age-associated differences, *Ann. Clin. Lab. Sci.* **2012**, 42, 145–151.
- Bin Wang, Base composition characteristics of mammalian miRNAs, *J. Nucleic Acids*, **2013**, 2013, Article ID 951570.
- Bin Wang, Editor, *RNA Nanotechnology*. Singapore: Pan Stanford Publishing Pte. Ltd. **2014**.
- Bin Wang, Human skin RNases offer dual protection against invading bacteria. *Front. Microbiol.* **2017**, 8, 624. doi: 10.3389/fmicb.2017.00624
- Bin Wang, The need for developing a single universal website for instrumental analysis to supplement the undergraduate curriculum, *Chem. Educator* **2017**, 22, 195–196.
- Bin Wang, The RNA i-motif in the primordial RNA world, *Orig. Life Evol. Biospheres* **2019**, 49, 105–109. doi: 10.1007/s11084-019-09576-7
- Bin Wang, A new classification scheme for teaching reaction types in general chemistry, *Chemistry Teacher International (CTI)* **2019**, published online on 08/15/2019.