



Professor Bing Wang, neonatologist, neurodevelopmental & molecular biologist, animal physiologist and nutritionist received her Medical Doctor degree from Tianjin Medical University, China, and a Ph.D. in Nutritional Biochemistry from the University of Sydney, Australia. Currently Prof. Wang is an Honorary Associate in the School of Molecular & Biosciences at the University of Sydney, Adjunct Professor at Xiamen University, P.R. China and a registered nutritionist in Australia. Professor Wang has led the *Nutritional Neurodevelopment Research* programs in both academia and industry before being recruited to Charles Sturt University in Dec. 2012. Her areas of expertise includes molecular & cell biology, biochemistry, bioinformatics, neuroimaging (MRI & MRS) and cognitive function assessment in both animal and humans. She is well accomplished in translating basic science discovery to human clinical trials for the development of functional food products. She has made major contributions to the field of Nutritional Neurobiology and Glycobiology, and thus has emerged as an internationally recognized leader on the nutritional significance of human milk sialylglycoconjugates and brain cognitive development.

Currently, she supervises 3 PhD and 6 Master degree students in collaboration with Xiamen University, P.R. China.

Research interests

A key area of interest in Professor Wang's research program is centered in the area of molecular biochemistry & molecular biology with an emphasis on nutritional Glycobiology/Sialobiology and brain function. The overall goal of her research program is to elucidate the molecular and cellular basis of how nutrient components alter metabolic responses important in health and disease prevention from fetus to late life. Her particular interest is in neurodevelopment, cognitive function, eye and vision function, gut-brain axis for brain cognitive function using piglet as an animal model. Her research team also has experience in translating basic science discoveries to human and animal clinical trials for the development of functional foods.

Research approaches:

- Animal behavior assessment: stress behavior, learning ability, short-term, long-term and working memory;
- in vivo MRI and 1H-MRS for the assessment of brain structure and microstructure and metabolic changes;
- Microarray and PCR array for global gene expression profile and selected target gene pathway analyses;
- Protein and enzyme assays for assessing posttranslational modification analyses;
- Metabolomics using LC-MS/MS, NMR and HPLC for chemical processes involving metabolites during nutritional intervention.

The piglet was chosen as the preferred animal model because of its similarities in basic anatomic, physiological and nutrient requirements to human infants, particular neural development.

Publications:

1. Chen Y, Liu N, Troy FA II, **Wang B**. *Urinary Sialic Acids Levels: Lack of Correlation with Dietary Sialic Acid Intake in Pre-school Children*. Under review by BJN, 2013.
2. Zhu X, Liu Ni, Zheng ZQ, FA Troy, **Wang B**. *Molecular Characterization and Expression Analysis of ST8Sia II, III and IV in Piglets During Postnatal Development: Lack of Correlation Between Transcription and Posttranslational Levels*. Under review by Glycobiology, 2013.
3. Larvaron P, van de Looij Y, Somm E, **Wang B**, Gruetter R, Sizonenko SV and Hüppi PS. *Milk lactoferrin has benefits on neurogenesis of rescuing prenatal dexamethasone exposure induced brain injure*. Under review by Paediatric Res., 2013.
4. CW Yang, X Zhu, N Liu, Y Chen, HX Gan, **B Wang**. *Dietary Lactoferrin Supplementation Protects the Newborn Piglets from Early Weaning Diarrhea* MS in preparation for submission to Gastroenterology, 2013.
5. Gang HX, Zhang QZ, Chen Y, **Wang B**. *A template for spatial normalization and segmentation of MR images of the piglet brain*. MS in preparation for submission to J Neuroimaging, 2013.
6. **Wang B**. *Molecular Mechanism Underlying Sialic Acid as an Essential Nutrient for Brain Development and Cognition*. Adv Nutr. 2012;3:4655-4725.
7. Chen HJ, Wang P, Han YF; Ma J; Troy II FA; **Wang B**. *Evaluation of dietary intake of lactating women in China and its potential impact on the health of mothers and infants*. BMC Women's Health 2012;12:18. DOI: 10.1186/1472-6874-12-18
8. Wang F, **Wang B**. *The Deaminated Sugar Acid, KDN (2-keoto-3-deoxy-d-glycero-d-galacto-nononic Acid in Human Cancers*. Progress in Modern Biomedicine 2011;24:5152-5155.
9. Wang F, **Wang B**, Troy II FA. *Identification and Quantification of the Sialic Acids (N-acetylneuraminic acid [Neu5Ac], N-glycolylneuraminic Acid [Neu5Gc] and the Deaminated Sugar Acid, KDN (2-keoto-3-deoxy-d-glycero-d-galacto-nononic Acid in Human Cancers*. Glycobiology 2011:21
10. Shan Y, Yu HL, **Wang B**, and Troy II, FA. *Expression of TriSia & PolySia in Human Cancers: Potential Role as Diagnostic & Prognostic Biomarker for Cancer Screening*. Glycobiology 2011:21.
11. **Wang B**. *Sialic Acid is an essential nutrient for brain development and cognition*. Annual Review of Nutrition, 2009;29:177-222.
12. Thompson CL, **Wang B** & Holmes AJ. *The immediate environment during postnatal development has long-term impact on gut community structure in pigs*. The ISME Journal, 2008;2:739-48.
13. **Wang B**, Hu H, Yu B, Troy II, FA. *Molecular characterzation of UDP-N-acetylglucosamine-2-epimerase/N-acetylmannosamine kinase (GNE) gene and dietary sialic acid supplementation: effect on gene expression of GNE in piglets*. Curr Top Nutraceutical Res. 2008; 5:165-176.
14. **Wang B**, Yu B, Karim M, Hu H, Sun Y, Petocz P, Held S, McGreevy P, Brand-Miller J. *Dietary sialic acid supplementation improves learning and memory in piglets*. Am J Clin Nutr' 2007;85:561-9.
15. **Wang B**, Downing J, Petocz P, Brand-Miller J, Bryden W. *Metabolic fate of intravenously administered N-acetylneuraminic acid-6-14C in newborn piglets*. Asia Pacific J Clin Nutr 2007;16 :110-115.
16. **Wang B**, Hu H, Yu B. *Molecular Characterisation of pig Polysialyltransferase*

- (*ST8Sia IV*)- a critical gene for the formation of neural cell adhesion molecule and its response to sialic acid supplement in Piglets. 'Nutr Neurosci 2006; 9:147-154.
17. **Wang B.** 'Infant Nutrition' Book review, Nutrition & Dietetics, 2006;63:129.
 18. Karim M, **Wang B.** 'Is sialic acid in milk food for the brain?' Perspect Agric Vet Sci Nutr Nat Resour. 2006;1:018.
 19. **Wang B,** Yu B, Karim M, Hu H, Sun Y, McGreevy P, Petocz P, Held S, Brand-Miller J. *Sialic acid: a conditional nutrient that enhance learning and memory of newborn piglets.* Asia Pacific J Clin Nutr 2006;15(Suppl3):94.
 20. **Wang B,** Bing Yu, Muhsin Karim, Honghua Hu, Yun Sun, Paul McGreevy, Peter Petocz, Suzanne Held, Jennie Brand-Miller. *Sialic acid: a novel nutrient that enhances learning and memory.* Trend Glycosci Glycotechnol. 2006;18(S):23.
 21. **Wang B,** Karim M, Staples A, Quaggiotto P, Sun Y, Petocz P, Brand-Miller J. *Effects of administration of sialic acid on learning ability and memory of piglets.* Ann Nutr Metab 2005;49(s):114.
 22. **Wang B,** Brand Miller J. *The role and potential of sialic acid in human nutrition.* Eur J Clin Nutr 2003;57:1351-69.
 23. **Wang B,** Brand Miller J, McVeagh P, Petocz P. *Brain ganglioside and glycoprotein sialic acid in infants fed human milk vs infant formula.* Am J Clin Nutr 2003; 78:1024-9.
 24. Sumiyoshi W, Urashima T, Nakamura T, Arai I, Saito T, Tsumura N, **Wang B,** Brand-Miller J, Watanabe Y, Kazumasa K. *Determination of each neutral oligosaccharide in the milk of Japanese women during the course of lactation.* Br J Nutr 2003; 89: 61-9.
 25. Sumiyoshi W, Urashima T, Nakamura T, Arai I, Saito T, Tsumura N, **Wang B,** Brand-Miller J, Watanabe Y, Kazumasa K. *Sialyl oligosaccharides in the milk of Japanese women: changes in concentration during the course of lactation"* J Apply Glyosci 2003;50:461-467.
 26. **Wang B,** Brand Miller J, Sun Y, Ahmad Z, McVeagh P. *A longitudinal study of salivary sialic acid in preterm infants: comparison of breast-fed vs formula-fed.* J Pediatr 2001;138:914-6.
 27. **Wang B,** Brand Miller J, McVeagh P, Petocz P. *The concentration and distribution of sialic acid in human milk and infant formulas.* Am J Clin Nutr 2001;74:510-515.
 28. **Wang B,** Brand Miller J, Makrides M, Gibson B. *Is sialic acid a conditional nutrient in infancy: a precursor of brain ganglioside?* Ann Nutr Metab 2001;45(suppl 1) 444.
 29. **Wang B,** Brand Miller J, McNeil Y, McVeagh P. *Sialic acid concentration of brain gangliosides: Variation among eight mammalian species.* Comp Biochem Phys 119A, 1998;1:435-439.

Patents

1. **Wang B,** J Brand-Miller. Methods of improving learning and memory in mammals. 2005 Ref No. 19400/09302
2. **Wang B,** J Brand-Miller. Method of increasing the salivary sialic acid content in a mammal. 2005 Ref No. 19400/09187
3. **Wang B,** Faure M, Schmitt J. Lactoferrin and brain health and development in infants. 2009 Ref No. EP2010056237.
4. Faure M, **Wang B,** Schmitt J. Lactoferrin and neuronal health and development in infant gut. 2009 Ref No. EP2010056234
5. **Wang B,** Faure M, Schmitt J. Lactoferrin and brain health and protection in

adults. 2009 Ref No.EP2010056241

6. Faure M, **Wang B**, Schmitt J. Lactoferrin and gut neuronal health in adult and/or elderly. Ref No. EP2010056244
7. **Wang B**, L Fay, J Schmitt et al. Nutrition composition for supporting brain development and function of toddlers. June 2010 Ref No. EP2010057661
8. **Wang B** and Faure M. Lactoferrin and white matter Nov 2011 Ref No. EP11189879.7
9. **Wang B** Lactoferrin supplementation and diarrhea. Mar 2012 Ref No. 11872

Conference Chair

1. Conference chair and chair for scientific organization of Pre-Conference Symposium '*Nutritional Neurobiology: Science and Applications*' at The 5th World Congress on Controversies in Neurology 13-16th Beijing 2011.
2. Section chair '*Significance of Carbohydrates*' at the first International Conference on the Glycobiology of Human Milk Oligosaccharides May 16 & 17, 2011 Tivoli Hotel, Copenhagen, Denmark
3. Concurrent session 12, '*Nutrition for the Elderly*' at 30th Nutrition Society Australia Annual Scientific Meeting 29 Nov – 2 Dec 2006. (Member of Conference organization committee).
4. Symposium 4 '*Diabetes and glycemic index*' at 8th International Union of Nutritional Science International Symposium on Clinical Nutrition and 5th Asia Pacific Clinical Nutrition Society 15-18th Oct 2006 Hangzhou, China.
5. '*Biomedical Sciences*' Section at The 1st Australia-China Symposium on Science, Technology and Education 12-13, Aug 2006 UNSW Australia
6. '*Growth and Nutrition*' section, at the 23rd International Congress of Paediatrics 9-13 Sep 2001 Beijing China.

Invited Speaker

1. **Wang B**. '*Importance of Early Nutrition on Developing Brain from Fetal to Adulthood*'. The Sixth Child Health Forum, Chongqing China 21-23rd Oct 2011.
2. **Wang B**. '*Epigenetic effect of Early Nutrition on developing Brain*'. The Symposium '*Nutritional Neurobiology: Science and Applications*' at The 5th World Congress on Controversies in Neurology 13-16th Beijing 2011.
3. **Wang B**. '*Nutritional Significance of Sialic Acid in Human Milk: an Essential Nutrient for Brain Development and Cognition*'. 44th Annual Meeting of The European Society for Paediatric Gastroenterology, Hepatology and Nutrition. Sorrento, Italy, 25-28 May 2011.
4. **Wang B**. '*Molecular Mechanism Underlying Sialic Acid as an Essential Nutrient for Brain Development and cognition.*' The first international conference on the '*Glycobiology of Human Milk Oligosaccharides*' Copenhagen, Denmark, 16~17 May 2011.
5. **Wang B**. '*Neural Mechanisms of Fetal and infant development and their Role in Cognitive Behaviour Later Life. Opening lecture at the National Paediatric & Obstetrics Training Course, Wuxi* 22 Nov 2010.
6. **Wang B**. '*Early Nutrition on Brain development and Cognitive Function from Fetal to Adulthood*'. The Fifth Child Health Forum, Nanning China 29-31 Oct

2010.

7. **Wang B.** '*Neurocognitive Development in Children: Science and Applications*' at the symposium on Neurocognition on the Singapore Institute for Clinical Sciences (SICS) and Abbott Nutrition R&D, Pacific Asia, on 6 and 7 November 2009, Singapore.
8. **Wang B.** '*Brain Cognitive Development–International Methodology for Assessing Cognitive Function in Children.*' at workshop on the International Life Sciences Institute (ILSI) Chain "Evaluation current methodology for memory improvement in Children" 29th April 2009 Beijing China.
9. **Wang B.** '*Methodology Recommendation for Assessing Children 'Memory Improvement' in China.*' at workshop on the International Life Sciences Institute (ILSI) Chain "Evaluation current methodology for memory improvement in Children" 29th April 2009, Beijing China.
10. **Wang B.** '*Is sialy-oligosaccharide in milk food for the brain?*' at the 5th International Symposium Milk Genomics & Human Health. Sydney 14-16th Oct 2008.
11. **Wang B.** '*The important of sialic acid in human nutrition.*' at The 1st Australia-China Symposium on Science, Technology and Education 12-13, Aug 2006 Sydney, Australia
12. **Wang B.** '*Sialic acid in milk- a conditional nutrient for brain development.*' at 30th Nutrition Society Australia Annual Scientific meeting, Sydney, 29th Nov-2nd Dec 2006.
13. **Wang B.** '*Sialic Acid: A novel nutrient that enhances learning and memory.*' The Fifth International Sialoglycoscience Conference in Mishima, Japan. 27-30th 2006.
14. **Wang B.** '*Is Sialic acid in milk food for the brain?*' at School of Exercise and Nutrition Sciences, Deakin University 3rd Oct 2006
15. **Wang B.** '*Functional and novel brain foods identification, discovery and assessment*'. Veterinary Science, Uni Sydney & CRC Australia. 20th July 2006
16. **Wang B.** '*Can nutrition support modify brain function?*' The Garvan Institute of Medical Research 10th August 2005.
17. **Wang B.** '*Is sialic acid in milk food for the brain?*' at Faculty of Medicine, Xiamen University P. R. China on 3rd May 2005
18. **Wang B.** '*Functional role of sialic acid in infant nutrition and brain development.*' at Tianjin Medical University P.R.China. 8th May 2005
19. **Wang B.** '*Early nutrition and brain development and cognition.*' At Faculty of Medicine, the University of Sydney. 14th Sep 2004
20. **Wang B.** '*Is sialic acid a conditional nutrient in infancy: a precursor of brain ganglioside?*' at Infant Nutrition and brain development. Mead Johnson Nutritional USA 6-8th 2003 Guangzhou

International Journal Reviewer

1. Editorial board member of International Journal of Health and Nutrition
2. American Journal of Clinical Nutrition

3. British Journal of Nutrition
4. Nutrition & Dietetics
5. European Journal of Clinical Nutrition
6. Journal of Pediatric Gastroenterology and Nutrition
7. Comparative Biochemistry and Physiology
8. Journal of Molecular evolution
9. Glycobiology
10. Bichimie
11. Nutrition & Dietetics
12. International Dairy Journal
13. Biochimie
14. J Nutr

Reviewer Grant Application from Outside Australia

Funding body: The Health Research Council of New Zealand (International Investment Opportunities Fund (IIOF))

Funding Body: Nestle Research Centre and Nestle Nutrition Research Foundation for project grant in the category of Nutrition and Brain Health.

Awards and Honours

1. Nestle Discovery awarded 2011 for “Outstanding R&D Discovery Research”. Dec 2011.
2. Registered Nutritionist. The Nutrition Society of Australia recognizes the qualifications and experience in the field of Nutrition Science. Oct 2008 –Present.
3. Honorary Associated, School of Molecular Bioscience G08, The University of Sydney NSW 2006, Australia, August 2007-present.
4. Min-Jiang Scholar and Adjunct Professor, Xiamen University School of Medicine, P.R. China, Dec. 2007-present.
5. Guest Professor, Faculty of Medicine, Xiamen Univ. Sep 2006.
6. Outstanding Postgraduate Student Award 2001 from the Australian Science and Technology Society, 21st Jul 2002.
7. American Society for Nutritional Science travel grant awarded 2001
8. Australia Nutrition Trust travel grant awarded 2001 (AU\$ 2000)
9. Travel grant awarded from Nutrition Society of Australia 1998-2000
10. Travel grant awarded from Faculty of Science 1998-2000
11. "Excellent teaching article" in Tianjin Medical University in 1996.
12. "Excellent lecturing" award in Tianjin Medical University in 1994.
13. "Outstanding Staff" of Tianjin Medical University in 1993.
14. The thesis “Cow's milk feeding of neonate and late metabolic acidosis” was awarded the 3rd prize of excellent thesis in the 6th National Medical academic conference of middle age and young doctors. (Paediatrics) by The Ministry of Health of the People’s Republic of China and Chinese Medical Association on 29th October 1991.

Membership

1. Member, Nutrition Society of Australia (1997-present).
2. Treasurer, Nutrition Society of Australia (Sydney) 2002- 2007
3. Member, Scientific Committee of the Nutrition Society of Australia (Sydney, 2000-June 2007)
4. Member, American Nutrition Society, USA (2008- present).
5. Life Member, Ausinan Science and Technology Society (from 2004)
6. Member, International Society of Nutrigenetics/Nutrigenomics (2006-present).
7. International Glycobiology Society 2010-present.
8. Member, Society of Pediatrics, Chinese Medical Association (1983-1997).