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Plant Biology Division  
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## **EMPLOYMENT**

**2010-Present**, Associate Professor, Head of Laboratory of Structural Biology,  
Plant Biology Division, Samuel Roberts Noble Foundation, Ardmore, OK 73401  
**2004-2009**, Assistant Professor, Head of Laboratory of Structural Biology,  
Plant Biology Division, Samuel Roberts Noble Foundation, Ardmore, OK 73401  
**2002- 2004**, Research Scientist, Head of Lab of Structural Biology,  
Plant Biology Division, Samuel Roberts Noble Foundation, Ardmore, OK 73401  
**1999- 2002**, Research Fellow, Laboratory of Structural Biology,  
NIEHS, NIH, Research Triangle Park, NC 27709  
**1996- 1999**, Research Associate, Crystallography Program,  
Oklahoma Medical Research Foundation, Oklahoma City, OK 73104  
**1995- 1996**, Research Associate, Department of Chemistry,  
University of Manchester, Manchester, UK  
**1993- 1995**, Research Associate, Institute of Biophysics, Chinese Academy of Sciences,  
Beijing, China

## **EDUCATION**

**1990-1993**, Ph.D. in Protein Crystallography, Institute of Biophysics  
Chinese Academy of Sciences, Beijing, China  
**1987-1990**, M.S. in Physical Chemistry, Dept. of Chemistry, Wuhan University, Wuhan, China  
**1983-1987**, B.S. in Chemistry, Dept. of Chemistry, Wuhan University, Wuhan, China

## **PROFESSIONAL ASSOCIATION MEMBERSHIPS**

American Crystallographic Association  
American Society of Plant Biologists

## **HONORS AND AWARDS**

2000 First Prize in Natural Science, Chinese Academy of Sciences  
1996 Outstanding research paper prize in Biochemistry, Biophysics, and Molecular  
Biology, Chinese Society of Biochemistry and Molecular Biology

## **RESEARCH GRANTS**

Wang, X. (PI), Dixon, R.A. (Co-PI), National Science Foundation, 2004-2008, \$495,784.  
“Structural and functional studies of plant natural product uridine diphosphate  
glycosyltransferases”

## **PROFESSIONAL SERVICE**

Manuscripts reviewed for the following journals: *Proc. Natl. Acad. Sci. USA.*;  
*PLoS Biology*; *Plant Cell*; *J. Mol. Biol.*; *J. General Virology*;  
*Anti-Cancer Agents in Medicinal Chemistry*; *Acta Crystallographica*;  
*Molecules*; *Biochimica et Biophysica Acta*; *Archives of Microbiology*;  
*Journal of Molecular Catalysis B: Enzymatic*  
Grant proposals reviewed for the National Science Foundation

## **PUBLICATIONS**

- (1) **Wang, X.** (2009). Structure, mechanism and engineering of plant natural product glycosyltransferases. *FEBS Letters* 583, 3303-3309.
- (2) Modolo, L.V., Li, L., Pan, H., Blount, J.W., Dixon, R.A., **Wang, X.** (2009). Crystal structures of glycosyltransferase UGT78G1 reveal the molecular basis for glycosylation and deglycosylation of (iso)flavonoids. *J. Mol. Biol.* 392, 1292-1302.
- (3) Modolo, L.V., Escamilla-Trevino L.L., Dixon, R.A., **Wang, X.** (2009). Single amino acid mutations of Medicago glycosyltransferase UGT85H2 enhance activity and impart reversibility. *FEBS Letters* 583, 2131-2135.
- (4) Li, L., Chang, Z., Pan, Z., Fu, Z., **Wang, X.** (2008). Modes of heme-binding and substrate access for cytochrome P450 CYP74A revealed by crystal structures of allene oxide synthase. *Proc. Natl. Acad. Sci. USA.* 105, 13883-13888.
- (5) Chang, Z., Li, L., Pan, Z., **Wang, X.** (2008). Crystallization and preliminary X-ray analysis of allene oxide synthase, cytochrome P450 CYP74A2 from *Parthenium argentatum*. *Acta Crystallographica*. F64, 668-670.
- (6) Shao, H., Dixon, R.A., **Wang, X.** (2007). Crystal structure of vestitone reductase from Alfalfa (*Medicago sativa* L.). *J. Mol. Biol.* 369, 265-276.
- (7) Li, L., Modolo, L.V., Escamilla-Trevino L.L., Achnine, L., Dixon, R.A., **Wang, X.** (2007). Crystal structure of *Medicago truncatula* UGT85H2 - Insights into the structural basis of a multifunctional (iso)flavonoid glycosyltransferase. *J. Mol. Biol.* 370, 951-963.
- (8) Modolo, L.V., Blount, J.W., Achnine, L., Naoumkina, M.A., **Wang, X.**, Dixon, R.A. (2007). A functional genomics approach to (iso)flavonoid glycosylation in the model legume *Medicago truncatula*. *Plant Molecular Biology* 64, 499-518.
- (9) He, X., **Wang, X.**, Dixon, R.A. (2006). Mutational analysis of the *Medicago* glycosyltransferase UGT71G1 reveals residues that control regio-selectivity for (iso)flavonoid glycosylation. *J. Biol. Chem.* 281, 34441-34447.
- (10) **Wang, X.**, He, X., Lin, J., Shao, H., Chang, Z., Dixon, R.A. (2006). Crystal structure of isoflavone reductase from Alfalfa (*Medicago sativa* L.). *J. Mol. Biol.* 358, 1341-1352.
- (11) Shao, H., He, X., Achnine, L., Blount, J.W., Dixon, R.A., **Wang, X.** (2005). Crystal structures of a multifunctional triterpene/flavonoid glycosyltransferase from *Medicago truncatula*. *Plant Cell* 17, 3141-3154.
- (12) **Wang, X.**, McLachlan, J., Zamore, P.D., Hall, T.M.T. (2002). Modular recognition of RNA by a human Pumilio-homology domain. *Cell* 110, 501-512.

- (13) **Wang, X.**, Zamore, P.D., Hall, T.M.T. (2001). Crystal structure of a Pumilio homology domain. *Molecular Cell* 7, 855-865.
- (14) **Wang, X.**, Hall, T.M.T. (2001). Structural basis for recognition of AU-rich element RNA by the HuD protein. *Nature Structural Biology* 8, 141-145.
- (15) **Wang, X.**, Terzyan, S., Tang, J., Loy, J.A., Lin, X., Zhang, X.C. (2000). Human plasminogen catalytic domain undergoes a novel conformational change upon activation. *J. Mol. Biol.* 295, 903-914.
- (16) **Wang, X.**, Tang, J., Hunter, B., Zhang, X. (1999). Crystal structure of streptokinase beta-domain. *FEBS Lett* 459, 85-89.
- (17) **Wang, X.**, Lin, X., Loy, J.A., Tang, J., Zhang, X.C. (1998). Crystal structure of the catalytic domain of human plasmin complexed with streptokinase. *Science* 281, 1662-1665.
- (18) Zhao, H., Tang, L., **Wang, X.**, Zhou, Y., Lin, Z. (1998). Structure of a snake venom phospholipase A<sub>2</sub> modified by p-bromo-phenacyl-bromide. *Toxicon* 36, 875-886.
- (19) Rivera, M., Seetharaman, R., Ghirdhar, D., Wirtz, M., Zhang, X., **Wang, X.**, White, S. (1998). The reduction potential of cytochrome b5 is modulated by its exposed heme edge. *Biochemistry* 37, 1485-1494.
- (20) **Wang, X.**, Wang, C., Tang, J., Dyda, F., Zhang, X.C. (1997). The crystal structure of bovine bile salt activated lipase: insights into the bile salt activation mechanism. *Structure* 5, 1209-1218.
- (21) **Wang, X.**, Zhao, H., Lin, Z., Zhou, Y. (1997). Crystal Structure of Ca<sup>2+</sup>-saturated acidic phospholipase A<sub>2</sub> from *Agkistrodon halys pallas*. *Acta Biochemica et Biophysica Sinica*, 29, 142-149.
- (22) **Wang, X.**, Zhao, H., Lin, Z., Zhou, Y. (1996). Crystallization and X-ray diffraction data of Ca<sup>2+</sup>-free and Ca<sup>2+</sup>-binding acidic phospholipase A<sub>2</sub> from the venom of *Agkistrodon halys pallas*. *Acta Biophysica Sinica* 12, 183-186.
- (23) Niu, X., Meng, W., Gui, L., **Wang, X.**, Lin, Z. (1996). The crystallization and preliminary crystallographic analysis of the monoclinic crystal form of basic phospholipase A<sub>2</sub> from the venom of *Agkistrodon halys pallas*. *Acta Biochemica et Biophysica Sinica* 28, 206-209.
- (24) **Wang, X.**, Yang, J., Gui, L., Lin, Z., Chen, Y., Zhou, Y. (1996). Crystal structure of an acidic phospholipase A<sub>2</sub> from the venom of *Agkistrodon halys pallas* at 2.0Å resolution. *J. Mol. Biol.* 255, 669-676.
- (25) **Wang, X.**, Chen, R., Lin, Z. (1995). Modelling study of a neutral phospholipase A<sub>2</sub> from the venom of *Agkistrodon halys pallas*. *Acta Biochemica et Biophysica Sinica* 27, 602-609.
- (26) Xie, C., **Wang, X.**, Song, Z., Qu, S., Wang, P., Quo, Z. (1992). A microcalorimetric study on human lung cancer A549 cells whose metabolism is inhibited by medicated liposome. *Thermochimica Acta* 205, 33-37.
- (27) **Wang, X.**, Xie, C., Qu, S., Zhou, Z. (1991). Microcalorimetric study of Mitochondrial Metabolism. *Thermochimica Acta* 176, 69-74.
- (28) Deng, F., Guo, Y., **Wang, X.**, Xie, C. (1990). Measurement of Thermochemistry of Embryonic Development of *Paramisgurnus dabryanus*. *Journal of Wuhan University*, No.1, 127-128.
- (29) Lin, Z., Tang, L., Zhao, K., Zhao, H., **Wang, X.**, Meng, W., Gui, L., Song, S., Chen, Y., Zhou, Y. (2000). Structures and pharmacological activities of venom phospholipase A<sub>2</sub>

from *Agkistrodon halys pallas*. In *Natural and Synthetic Toxins: Biological Implications (ACS Symposium series 745)*. (Tu A.T. and Gaffield W. ed.), American Chemical Society, Washington, DC. pp249-261.

- (30) Lin, Z., **Wang, X.**, Yang, J., Gui, L., Zhou, Y. (1993) Structure of acidic phospholipase A<sub>2</sub> from the venom of *Agkistrodon halys pallas*. In *Advances in Venom and Toxin Research* (Tan, N.M. et al. ed.), Malaysian Society Toxinology, Kuala Lumpur. pp89-94.

### **INVITED SEMINAR/CONFERENCE PRESENTATIONS**

- (1) 2009 American Crystallographic Association Annual Meeting, Toronto, Canada, July 2009 (Talk)
- (2) Dept. of Biochemistry and Molecular Biology, University of Oklahoma College of Medicine, Oklahoma City, Oklahoma, February, 2009 (Talk)
- (3) 2009 Glycobiology Gordon Research Conference, Ventura, California, January 2009 (Talk)
- (4) Dept. of Biochemistry and Molecular Biology, Oklahoma State University, Stillwater, Oklahoma, September, 2008 (Talk)
- (5) XXI Congress and Assembly of the International Union of Crystallography, Osaka, Japan, August 2008
- (6) The 22nd Symposium of the Protein Society, San Diego, CA, July, 2008
- (7) 2007 American Crystallographic Association Annual Meeting, Salt Lake City, Utah, July, 2007
- (8) The 18th International Conference on Arabidopsis Research, Beijing, China, June 2007
- (9) Center for Plant Cell Biology, University of California at Riverside, March, 2007 (Talk)
- (10) 2006 American Society of Plant Biologists Annual Meeting, Boston, MA, August 2006
- (11) 10th International Conference on the Crystallization of Biological Macromolecules, Beijing, China, June, 2004
- (12) 2003 American Society of Plant Biologists Annual Meeting, Honolulu, Hawaii, July, 2003
- (13) Institute of Biophysics, Chinese Academy of Sciences, Beijing, China, January, 2002 (Talk)
- (14) 2001 American Crystallographic Association Annual Meeting, Los Angeles, CA, July, 2001
- (15) Symposium in Structural Biology and Bioinformatics, Chapel Hill, NC, March, 2001
- (16) 2000 Mid-Atlantic Protein Crystallography Meeting, Hapers Ferry, WV, May, 2000
- (17) 1998 SouthWest Macromolecular Symposium, College Station, TX, November, 1998 (Talk)
- (18) 1998 American Crystallographic Association Annual Meeting, Arlington, VA, July, 1998
- (19) 1997 American Crystallographic Association Annual Meeting, St. Louis, MO, July, 1997
- (20) Second Conference of the Asian Crystallographic Association, Bangkok, Thailand, November, 1995
- (21) Seminar-cum-School on Macromolecular Crystallographic Data, Calcutta, India, November, 1995 (Talk)
- (22) The First East Asian Symposium on Biophysics, Himeji, Japan, May 1994 (Talk)
- (23) XVI Congress and General Assembly of the International Union of Crystallography, Beijing, China, August, 1993

## **Biographical Information on Dr. Xiaoqiang Wang**

Dr. Xiaoqiang Wang is associate Professor and head of the structural biology laboratory in the Plant Biology Division, Samuel Roberts Noble Foundation.

He received his Bachelor's degrees in Chemistry from Wuhan University, China, and Ph.D. in Crystallography/Molecular Biology from Institute of Biophysics, Chinese Academy of Sciences, and postdoctoral training in Structural Biology at University of Manchester (UK), Oklahoma Medical Research Foundation, and National Institute of Environmental Health Sciences (NIEHS)/National Institutes of Health (NIH). He has been working in structural biology area and published over 20 papers in the prestigious journals such as *Science*, *Cell*, *Molecular Cell*, *Nature Structural Biology*, *PNAS*, *Plant Cell* etc.

His current research interests are structural studies of plant proteins including enzymes involved in the biosynthesis of the important plant natural products and nucleic acid binding proteins involved in gene regulation. His lab is working on three types of enzymes involved in plant natural product biosynthesis, including glycosyltransferases, reductases, and cytochrome P450s. They have determined crystal structures of several key enzymes to elucidate the molecular basis of the biosynthesis of plant natural products and explore enzyme engineering for synthesis of novel bioactive natural products with implications for improving plant, animal and human health.