



Zihe Rao, PhD MCAS

Professor of Structural Biology

Education:

1977 B.Sc. (University of Science & Technology of China, CAS);

1982 M.Sc. (Institute of Biophysics, CAS);

1989 Ph.D. (Melbourne University, Australia)

Date of Birth: 6-9-1950 in Nanjing, China

Career summary:

- Peking Insulin Structure Research Group, Institute of Biophysics, CAS (1977-1985)
- Laboratory of Molecular Biophysics, Oxford University (1989-1998)
- Head of Laboratory of Structural Biology, Tsinghua University (1996-)
- Director-General of the Institute of Biophysics, Chinese Academy of Sciences (2003-2007)
- Elected as a Member of Chinese Academy of Sciences (2003)
- Elected as a Member of Third World Academy of Science (2004)
- Executive council member of the IUPAB (2005-)
- President of Chinese Crystallographic Society (2003-2006)
- Vice- President of Chinese Crystallographic Society (2006-)
- President of the Biophysical Society of China (2005-)
- President of Nankai University (2006-)

Awards:

- Qiushi Outstanding Scientist Prize in Life Sciences (1999);
- Yangtze River Distinguished Scholar Professor, Ministry of Education (2000);
- He Liang He Li Foundation Science and Technology Prize (2003);
- Chen Jiageng Prize for Life Science (2006);
- Trieste Science Prize for Medical Science (2006)

Editorial Boards:

- Member of the Scientific Advisory Board for *SPINE2-COMPLEXES*
- Member of the Advisory Board, *FEBS Journal*
- Member of the Editorial Board, *Journal of Structural Biology*

- Member of the Editorial Board, *Journal of Structural & Functional Genomics*
- Member of the Editorial Board, *Acta Biochimica et Biophysica Sinica*
- Member of the Editorial Board, *Journal of General Virology*

List of publications (since 2003):

1. He X, Zhou J, Bartlam M, Zhang R, Ma J, Lou Z, Li X, Li J, Joachimiak A., Zeng Z, Ge R, Rao Z* & Liu YF*. 2008. Crystal structure of the polymerase PAC: PB1N complex from an avian influenza H5N1 virus. *Nature*, (in press)
2. Li X, Lou Z, Li X, Zhou W, Ma M, Cao Y*, Geng Y, Bartlam M, Zhang XC* & Rao Z. 2008. Structure of human cytosolic X-prolyl aminopeptidase: a double Mn(II) dependent dimeric enzyme with a novel three-domain subunit. *J. Biol. Chem.* (in press)
3. Zhang R, Zhu G, Zhang W, Cao S, Ou X, Li X, Bartlam M, Xu Y*, Zhang XC* & Rao Z. 2008. Crystal structure of a carbonyl reductase from *Candida Parapsilosis* with anti-prelog stereo specificity. *Protein Science* (in press)
4. Chen J, Li W, Wang M, Zhu G, Liu D, Sun F, Hao N, Li XM, Rao Z & Zhang XC*. 2008. Crystal Structure and Mutagenic Analysis of GDOsp, a Gentisate 1,2- Dioxygenase from *Silicibacter Pomeroyi*. *Protein Science* (in press)
5. Gräslund S, Nordlund P, Weigelt J, Bray J, Gileadi O, Knapp S, Oppermann U, Arrowsmith C, Hui R, Ming J, dhe-Paganon S, Park HW, Savchenko A, Yee A, Edwards A, Vincentelli R, Cambillau C, Kim R, Kim SH, Rao Z, Shi Y, Terwilliger TC, Kim CY, Hung LW, Waldo GS, Peleg Y, Albeck S, Unger T, Dym O, Prilusky J, Sussman JL, Stevens RC, Lesley SA, Wilson IA, Joachimiak A, Collart F, Dementieva I, Donnelly MI, Eschenfeldt WH, Kim Y, Stols L, Wu R, Zhou M, Burley SK, Emtage JS, Sauder JM, Thompson D, Bain K, Luz J, Gheyi T, Zhang F, Atwell S, Almo SC, Bonanno JB, Fiser A, Swaminathan S, Studier FW, Chance MR, Sali A, Acton TB, Xiao R, Zhao L, Ma LC, Hunt JF, Tong L, Cunningham K, Inouye M, Anderson S, Janjua H, Shastry R, Ho CK, Wang D, Wang H, Jiang M, Montelione GT, Stuart DI, Owens RJ, Daenke S, Schütz A, Heinemann U, Yokoyama S, Büssow K, Gunsalus KC. 2008. Structural Genomics Consortium; China Structural Genomics Consortium; Northeast Structural Genomics Consortium, Protein production and purification. *Nat Methods* 5(2):135-46
6. Li L, Liu X, Yang W, Xu F, Feng L, Bartlam M*, Wang L*& Rao Z. 2008. Crystal structure of long-chain alkane monooxygenase (LadA) in complex with coenzyme FMN: unveiling the long-chain alkane hydroxylase. *J Mol Biol.*, 376(2): 453-465
7. Xue X, Yu H, Yang H, Xue F, Wu Z, Shen W, Li J, Zhou Z, Ding Y, Zhao Q, Zhang XC, Liao M, Bartlam M & Rao Z*. 2008. Structures of Two Coronavirus Main Proteases: Implications for Substrate Binding and Anti-viral Drug Design. *J Virol.*, 82(5):2515-2527
8. Li M, Li S, Lou Z, Liao X, Zhao X, Meng Z, Bartlam M* & Rao Z*. 2008. Crystal structure of human transgelin. *J Struct Biol.* 162: 229-236
9. Bartlam M, Xue X & Rao Z*. 2008. The search for a structural basis for therapeutic intervention against the SARS coronavirus. *Acta Crystallogr A.* , 64(1): 204-213
10. Shaw N, Zhao M, Cheng C, Xu H, Saarikettu J, Li Y, Da Y, Yao Z, Silvennoinen O, Yang

- J*, Liu ZJ*, Wang BC & Rao Z. 2007. The multifunctional human p100 protein 'hooks' methylated ligands. *Nat Struct Mol Biol.* 14(8):779-784
11. Zhao Q, Qin L, Jiang F, Wu B, Yue W, Xu F, Rong Z, Yuan H, Xie X, Gao Y, Bai C, Bartlam M, Pei X* & Rao Z*. 2007. Structure of human spindlin1: tandem tudor-like domains for cell cycle regulation *J. Biol. Chem.*, 282(1):647-656
 12. Ye S, Wu X, Wei L, Tang D, Sun P, Bartlam M & Rao Z*. 2007. An insight into the mechanism of human cysteine dioxygenase: Key roles of the thioether-bonded tyrosine-cysteine cofactor. *J Biol Chem.*, 282(5):3391-3402
 13. Yang X, Zhou J, Sun L, Wei Z, Gao J, Gong W, Xu RM, Rao Z & Liu Y*. 2007. Structural basis for the function of DCN-1 in protein Neddylation. *J. Biol. Chem.*, 282(34): 24490-24494
 14. Xue X, Yang H, Shen W, Zhao Q, Li J, Yang K, Chen C, Jin Y, Bartlam M & Rao Z*. 2007. Production of Authentic SARS-CoV M^{pro} with Enhanced Activity: Application as a Novel Tag-cleavage Endopeptidase for Protein Overproduction. *J. Mol. Biol.*, 366(3):965-975
 15. Zheng W, Sun F, Bartlam M, Li XM, Li R & Rao Z*. 2007. The crystal structure of human isopentenyl diphosphate isomerase at 1.7 Å resolution reveals its catalytic mechanism in isoprenoid biosynthesis. *J. Mol. Biol.* 366(5):1447-1458
 16. Wu B, Liu Y, Zhao Q, Liao S, Zhang J, Bartlam M, Chen W & Rao Z*. 2007. Crystal Structure of RS21-C6, Involved in Nucleoside Triphosphate Pyrophosphohydrolysis. *J Mol Biol.* 367(5):1405-1412
 17. Li Z, Huang Y, Ge J, Fan H, Zhou X, Li S, Bartlam M, Wang H & Rao Z*. 2007. The Crystal Structure of MCAT from Mycobacterium tuberculosis Reveals Three New Catalytic Models. *J Mol Biol.* 371(4): 1075-1083
 18. Cao S, Lou Z, Tan M, Chen Y, Liu Y, Zhang Z, Zhang XC, Jiang X, Li X & Rao Z*. 2007. Structural Basis for the Recognition of Blood Group Trisaccharides by Norovirus. *J Virol.* 81(11):5949-5957
 19. Rao Z. 2007. History of protein crystallography in China. *Philos Trans R Soc Lond B Biol Sci*, 362(1482):1035-1042 (Preview)
 20. Bartlam M, Xu YY & Rao Z*. 2007. Structural proteomics of the SARS coronavirus: a model response to emerging infectious diseases. *J Struct Funct Genomics.* 8(2-3): 85-97 (Preview)
 21. Huo X, Su D, Wang AJ, Zhai YJ, Xu JX, Li X, Bartlam M*, Sun F*& Rao Z. 2007. Preliminary molecular characteristic and crystallization of mitochondrial respiratory Complex II from porcine heart. *FEBS Journal*, 274(6):1524-1529
 22. Pang X, Xu F*, Bell SG, Guo D, Wong LL* & Rao Z. 2007. Purification, crystallization and preliminary crystallographic analysis of cytochrome P450 203A1 from *Rhodospseudomonas palustris*. *Acta Cryst. Sect F* 63(4):342-345
 23. Peng Y, Xu F*, Bell SG, Wong LL* & Rao Z. 2007. Crystallization and preliminary X-ray diffraction studies of a ferredoxin reductase from *Rhodospseudomonas palustris* CGA009. *Acta Cryst. F*, 63(5): 422-425

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25. Chu FL, Lou Z, Chen YW, Liu YW, Gao B, Zong LL, Khan A.H., Bell J.I., Rao Z & Gao F*. 2007. First glimpse of the peptide presentation by rhesus macaque MHC class I: crystal structures of Mamu-A*01 complexed with two immunogenic SIV epitopes and insights into CTL escape. *J Immunol.*, 178(2): 944-952
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Prevention (Mellbourn A., ed.) 2006 *Gidlunds Hedemora/Sweden*, pp. 105-118

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42. Chu LH, Choy WY, Tsai SN, Rao Z & Ngai SM*. 2006. Rapid peptide-based screening on the substrate specificity of severe acute respiratory syndrome (SARS) coronavirus 3C-like protease by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry. *Protein Science*, 15(4):699-709
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