

Curriculum Vitae

Peng Chen



PERSONAL DATA

Born June, 1979. Address: College of Chemistry,
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Phone 86-10-62755773 Beijing, 100871 China

EDUCATION

2003-2007 **THE UNIVERSITY OF CHICAGO** Chicago, USA
Ph.D. in Chemistry

2002-2003 **THE UNIVERSITY OF CHICAGO** Chicago, USA
M.S. in Chemistry

1998-2002 **PEKING UNIVERSITY** Beijing, China
B.S. in Chemistry

1999-2002 **PEKING UNIVERSITY** Beijing, China
B.S. Double degree in Economics

POSITIONS

2011/05- Investigator, Peking-Tsinghua Center for Life Sciences, Beijing, China

2011/04- Associate Director, Synthetic and Functional Biomolecules Center (SFBC),
Peking University. Beijing, China

2010/03- Vice-chairman, Department of Chemical Biology,
College of Chemistry, Peking University. Beijing, China

2009/07- Investigator (Associate Professor), Department of Chemical Biology,
College of Chemistry, Peking University. Beijing, China

2007-2009 Postdoctoral Fellow, The Scripps Research Institute. San Diego, USA
Advisor: Prof. Peter G. Schultz

2002-2007 Research Assistant, Department of Chemistry, The University of Chicago. Chicago, USA
Advisor: Prof. Chuan He

2004-2005 Interdisciplinary Research Fellow, Burroughs Wellcome Fund.
Department of Microbiology, The University of Chicago. Chicago, USA
Co-Advisor: Prof. Olaf Schneewind

RESEARCH INTERESTS

- Protein chemistry and labeling in living cells
- Understanding the invading and defense mechanisms of pathogens in infectious diseases.
- Protein therapeutic engineering
- Probing the roles of reactive oxidative species (ROS) and transition metals in aging diseases.

AWARDS

- 2013 National Young Scientists Award (China)
- 2013 National Program for Special Support of Eminent Professionals (China)
- 2012 National Natural Science Funds for Distinguished Young Scholar (China)
- 2012 CCS (Chinese Chemical Society) Young Investigator Award
- 2012 SCOPUS Young Scholar, Elsevier.
- 2011 WuXi PharmaTech Life Science and Chemistry Award.
- 2011 Instructor award for the “Challenge Cup” undergraduate research competition at PKU.
- 2007 Elizabeth R. Norton Prize for excellence in research in chemistry, The University of Chicago.
- 2005 Society of Cosmetic Chemists Award.
- 2004 Burroughs Wellcome Fellowship, Burroughs Wellcome Fund.

PUBLICATIONS

Selected publications as an independent P.I.

- 41 Li J, Yu J, Zhao J, Wang J, Zheng S, Lin S, Chen L, Yang M, Jia S, Zhang X and **Chen P***. “Palladium-triggered Deprotection Chemistry for Protein Activation in Living Cells”, *Nat. Chem.* (2014) *In print*.
- 40 Yang M, Li J, **Chen P***. “Transition Metal Mediated Biocompatible Protein Chemistry in Living Cells”. *Chem. Soc. Rev.* (2014). *Emerging Investigators Special Issue (invited contribution)*
- 39 Yang Y, Lin S, Lin W and **Chen P***. “Ligand-assisted Dual-site Click Labeling of EGFR on Living Cells” *ChemBioChem.* (2014) *Special Issue on Genetic Code Expansion (invited contribution)*
- 38 Yang M, Jalloh A, Wu P* and **Chen P***. “Biocompatible click chemistry enabled labeling of cytosolic proteins and compartment-specific pH indicators” *Nat. Comm.* (2014), *under revision*.
- 37 Hao Z, Lou H, Zhu R, Zhu J, Zhang D, Zhao B, Zeng S, Chen X, Chan J, He C* and **Chen P***. “The multiple antibiotic resistance regulator MarR is a copper sensor in *Escherichia coli*” *Nat. Chem. Biol.*, (2014), 10, 21-8. [This work has been highlighted by (*RSC*) *Chemistry World*]
- 36 Lin S, Yan H, Li L, Yang M, Peng B, Chen S, Li W* and **Chen P***, “Site-specific Engineering of Chemical Functionalities on the Surface of Live Hepatitis D Virus” *Angew. Chem. Int. Ed.*, (2013), 52, 13970-4.
- 35 Li J, Lin S, Wang J, Jia S, Yang M, Zhang X, Hao Z and **Chen P*** “Ligand-free Palladium-mediated Site-specific Protein Labeling inside Gram-negative Bacterial Pathogens”. *J. Am. Chem. Soc.* (2013) 135, 7330-8.
- 34 Zhao J, Lin S, Huang Y, Zhao J*, **Chen P***. Mechanism-Based Design of a Photoactivatable Firefly Luciferase”. *J. Am. Chem. Soc.* (2013), 135, 7410-3.
- 33 Yang, M.; Song, Y.; Zhang, M.; Lin, S.; Hao, Z.; Liang, Y.; Zhang, D. and **Chen, P***. “Converting a solvatochromic fluorophore into a protein-based pH indicator for extreme acidity” *Angew. Chem. Int. Ed.*, (2012) 51, 7674-9.
- 32 Zhang M, Lin S, Song X, Liu J, Fu Y, Fu X, Chang Z*, and **Chen, P***. “A genetically incorporated crosslinker reveals chaperone cooperation in acid resistance”, *Nat. Chem. Biol.* (2011), 7, 671-7.

[This work is a “News Coverage” on *Chem. & Eng. News. Sep 7, 2011*, and has been highlighted by *Nature Asia-Pacific* on *Sep 5, 2011*]

31. Lin, S.; Zhang, Z.; Xu, H.; Li, L.; Chen, S.; Li, J.; Hao, Z.; **Chen, P***. “Site-specific incorporation of photocrosslinker and bioorthogonal amino acids into enteric bacterial pathogens”, *J. Am. Chem. Soc.* (2011), *133*, 20581-7.
30. Hao Z., Hong S., Chen X* and **Chen, P***. “Introducing Bioorthogonal Functionalities into Proteins in Living Cells”, *Acc. Chem. Res.*, (2011), *44*, 742-51.

Additional publications as an independent P.I.

- 29 Fan Y, Zhao J, Yan Q, **Chen P*** and Zhao D*. “A Water-soluble Triscyclometalated Organoiridium Complex: Phosphorescent Nanoparticle Formation, Nonlinear Optics, and Application for Cell Imaging”. *ACS Appl Mat. Inter.* (2014) *Epub ahead of print*
- 28 Ge X, Wang R, Ma J, Liu Y, Ezemaduka AN, **Chen P**, Fu X*, and Chang Z*. “DegP primarily functions as a protease for the biogenesis of β -barrel outer membrane proteins in the Gram-negative bacterium Escherichia coli”. *FEBS J.* (2013) doi: 10.1111/febs.12701.
- 27 Chang H, Han M, Huang W, Wei G, Chen J, **Chen P**, Chen R, Zhang J, Xu T* and Xu P*. “Light-induced protein translocation by genetically encoded unnatural amino acid in Caenorhabditis elegans”. *Protein Cell.* (2013), *4*, 883-6
- 26 Zhao BS, Zhang G, Zeng S, He C, and **Chen P***. “Probing subcellular organic hydroperoxide formation via a genetically encoded ratiometric and reversible fluorescent indicator.”, *Integr. Biol* (2013), *5*, 1485-9.
25. Liu, J.; Karpus, J.; Wegner, S.; **Chen P*** and He C*. “Genetically Encoded Copper(I) Reporters with Improved Responses for Use in Imaging”, *J. Am. Chem. Soc.* (2013), *135*:3144-3149.
24. Li, Y.; Yang, M.; Huang, Y.; Song, X.; Liu, L* and **Chen, P***. “Genetically encoded alkenyl-pyrrolysine analogues for thiol-ene reaction mediated site-specific protein labeling”, *Chem. Sci.*, (2012), *3*, 2766-2770.
23. Li, J. and **Chen, P***. "Moving Pd-mediated Protein Cross-coupling to Living Systems" *ChemBioChem.* (2012), *13*, 1728-31.
22. Wang J, Karpus J, Zhao BS, Luo Z, **Chen P** and He C*. “A selective fluorescent probe for carbon monoxide imaging in living cells.” *Angew. Chem. Int. Ed.*, (2012), *51*, 9652-6.
21. Li, Y.; Yang, M.; Huang, Y.; Li, Y.; **Chen, P***. and Liu, L*. “Ligation of Expressed Protein α -Hydrazides via Genetic Incorporation of an α -Hydroxy Acid.” *ACS Chem. Biol.* (2012), *7*, 1015-1022.
20. Wei, W.; Zhu, T.; Wang, Y.; Yang, H.; Hao, Z.; **Chen, P***. and Zhao, J*. “Engineering a gold-specific regulon for cell-based visual detection and recovery of gold.” *Chem. Sci.* (2012), *3*, 1780-1784.
19. Liu, J.; Zhang, M. and **Chen, P***. “Probing pH Mediated protein-protein interactions via photocrosslinking”, *SCIENTIA SINICA Chimica.* (2012) *42*, 1694-1699.
18. Li, J.; Wang, J. and **Chen, P***. “Unnatural amino acid mediated Protein Bioorthogonal Labeling” *ACTA CHIMICA SINICA* (2012), *70*, 1439-1445.
17. Chen, X.; Hao, Z. and **Chen, P***. “Protein photocrosslinking reveals dimer of dimers formation on

- MarR protein in *Escherichia coli*" *SCIENCE CHINA Chemistry* (2012). 42, 223-225.
16. Hao, Z.; Song, Y.; Lin, S.; Yang, M.; Liang, Y.; Wang, J.; **Chen, P***. "A readily synthesized cyclic pyrrolysine analogue for site-specific protein 'click' labeling". *Chem Commun (Camb)* (2011). 47, 4502-4504.
 15. **Chen, P***; Brugarolas P; and He, C*. "Redox Signaling in Human Pathogens", *Antioxid Redox. Signal.*, (2011), 14(6), 1107-18.
 14. Zhao, B.; Liang, Y.; Song, Y.; Zheng, C.; Hao, Z. and **Chen, P***. "A Highly Selective Fluorescent Probe for Visualization of Organic Hydroperoxides in Living Cells". *J. Am. Chem. Soc.* (2010). 132, 17065-7.

From Ph.D and Postdoc Research

13. **Chen, P.**; Dan G; Guo, J.; Ou, W; Geierstanger, B.H.; and Schultz, P.G. "A facile system for encoding unnatural amino acids in mammalian cells", *Angew Chem. Int. Ed.* (2009), 48(22), 4052-5.
12. Ai H, Shen W, Sagi A, **Chen P.**, Schultz P.G. "Probing protein-protein interactions with a genetically encoded photo-crosslinking amino acid." *ChemBioChem.* (2011), 12(12), 1854-7.
11. Dan, G.; **Chen, P.**; Peters, FB.[†]; Schultz P.G. "A genetically encoded epsilon-N-methyl lysine in mammalian cells", *ChemBioChem*, (2010), 11(8), 1066-8.
10. **Chen, P.**; Nishida, S.; Poor, C.B.; Cheng, A.; Bae, T.; Kuechenmeister, L.; Dunman, P.M.; Missiakas, D.; He, C. "A new oxidative sensing and regulation pathway mediated by the MgrA homologue SarZ in *Staphylococcus aureus*" *Mol. Microbiol.* (2009), 71(1), 198-211.
9. Poor C.; **Chen, P.**; Duguid E, Rice PA, He C. "Crystal structures of the reduced, sulfenic acid, and mixed disulfide forms of SarZ, a redox active global regulator in *Staphylococcus aureus*". *J. Biol. Chem.* (2009), 284(35), 23517-24.
8. **Chen, P.** and He, C. "Selective recognition of metal ions by metalloregulatory proteins", *Curr. Opin. Chem. Biol.* (2008), 12(2), 214-21.
7. Chen, H.; Hu, J.; **Chen, P.**; Lan, L.; Li, Z.; Hicks, LM.; Dinner AR. And He, C. "The *Pseudomonas aeruginosa* multidrug efflux regulator MexR uses an oxidation sensing mechanism", *Proc. Natl. Acad. Sci. USA.* (2008), 105 (36), 13586-91.
6. **Chen, P.**; Wasinger, E. C.; Zhao, J.; van der Lelie, D.; Chen, L.X. ; He, C. "Spectroscopic insights into lead(II) coordination by the selective lead(II)-binding protein PbrR691" *J. Am. Chem. Soc.* (2007), 129, 12350-1.
5. Sarkar, S.K.; Andoy, N.M.; Benitez, J.J.; **Chen, P.**; Kong, J.S.; He, C.; Chen, P. "Engineered holliday junctions as single-molecule reporters for protein-DNA interactions with application to a MerR-family regulator" *J. Am. Chem. Soc.* (2007), 129, 12461-12467.
4. Wegner, S.V.; Okesli, A.; **Chen, P.** and He, C. "Design of an emission ratiometric biosensor from MerR family proteins: A sensitive and selective sensor for Hg²⁺", *J. Am. Chem. Soc.* (2007), 129, 3474-5.
3. **Chen, P.**; Bae, T.; Williams, W.A.; Duguid, E.M.; Rice, P.A.; Schneewind, O. and He, C. "An oxidation sensing mechanism is used by a global regulator MgrA in *Staphylococcus aureus*", *Nature Chem. Biol.* (2006), 2, 591-5.
[A Science and Technology Concentrate highlighting this work appears in *Chem. & Eng. News* 84 [41] 31 (2006). The finding described in this paper had also been registered in the *Infectious Disease Biomarker Database* as a potential biomarker for *Staphylococcus aureus* vancomycin resistance.]
2. **Chen, P.**; Greenberg, B.; Taghavi, S.; Romano, C.; van der Lelie, D. and He, C. "An exceptionally selective lead(II)-regulatory protein from *Ralstonia metallidurans*: development of a fluorescent

lead(II) probe”, *Angew Chem. Int. Ed.*, (2005), 44, 2715-9.

[This work had been highlighted by *Chem. & Eng. News* 83 [15] 26 (2005); *Brookhaven National Laboratory News*, April 4, 2005; and several German based newspapers.]

1. **Chen, P.** and He, C. “Constructing highly sensitive and selective fluorescent biosensors for metal ions by using the MerR family proteins”, *J. Am. Chem. Soc.* (2004), 126, 728-9.

Books

1. 蒋华良, 陈拥军, **陈鹏**, 张礼和; 《化学生物学学科前沿与展望》, 科学出版社, **2013**, ISBN: 978-7-03-037949-8
Hualiang Jiang, Yongjun Chen, **Chen, P.** and Lihe Zhang, “Chemical Biology Frontier and Perspective”. *China Science Publishing* (2013), ISBN: 978-7-03-037949-8
2. 刘磊, **陈鹏**, 赵劲, 何川; 《化学生物学基础》, 科学出版社, **2010**, ISBN: 978-7-03-028767-0.
Liu, L.; Chen, P. Zhao, J. and He, C. “Principles of Chemical Biology”, *China Science Publishing* (2010), ISBN: 978-7-03-028767-0.

Patents

- (1) **US Patent** “A Facile System for Encoding Unnatural Amino Acids in Mammalian Cells” **Chen, P.**, Groff, D., Guo, J., Bernhard, G. and Schultz, PG. (2010), Publication #: **WO2010/114615**
- (2) **US Patent** “Identifying a modulator of bacterial MgrA function by contacting the MgrA polypeptide or its fragment with a candidate substance and assessing the binding of the MgrA polypeptide to a target DNA” **Chen, P** and He, C. (2007), Publication #: **WO2007/090123**

TEACHING

- *Fall 2009-2013*, “Introduction to Chemical Biology”, Graduate Course, PKU.
- *Spring 2012-2013*, “*Bioinorganic Chemistry*”, Graduate Course, PKU
- *Fall 2010-2013*, “Today’s Chemistry”, Freshman Course, PKU.
- *Since 2011*, Member of the Teaching Committee, College of Chemistry, PKU.

MAJOR GRANTS

- NSFC Distinguished Young Scholar (#21225206), “Chemical Biology”, *National Science Foundation of China (NSFC)*, 2013-2016.
- NSFC Major Project (#20932006), “New Organic reactions and approaches for living cell chemistry”, 2010-2013.
- NSFC Incubation Project (#91013005), “New Protein photocrosslinker to study the signal transduction mechanism of bacteria biofilm formation, 2011-2013.
- NSFC Young Scientist Project (#21001010), “Development and mechanistic study of biosensors for selective metal recognition”, 2011-2013.
- National 973 Project (#2010CB912300), “Genetic-code expansion technique for Protein Labeling”, *Ministry of Science and Technology (MOST)*, 2010-2014.
- National 973 Project (#2012CB917300), “Biogenesis, modification, assembly and quality control of membrane proteins”. *Ministry of Science and Technology (MOST)*, 2012-2016.
- High Education Research Project, “Mechanistic study of bacterial acid-resistance”, *Ministry of Education (MOE)*, 2011-2012.
- International Collaboration Project, Pfizer Inc, USA, “Evolution of Super Sortase for improved ligation efficiency”. 2011-2013.