

Curriculum Vitae

Updated at September 29, 2017

Lei Zheng, Ph.D.

PRESENT TITLE: Associate Professor of Biochemistry and Molecular Biology
The University of Texas Medical School at Houston

WORK ADDRESS: Center for Membrane Biology
Department of Biochemistry and Molecular Biology
6431 Fannin Street, MSB 6.218

BIRTHDATE: April 23, 1972

CITIZENSHIP: USA

UNDERGRADUATE EDUCATION:

B.S. Microbiology, Shandong University, China 1990-1994

GRADUATE EDUCATION:

M.S. Microbiology, Shandong University, China 1994-1997

Ph.D. Biochemistry, University of Bern, Switzerland 1999-2003

POSTGRADUATE TRAINING:

Structural Biology, Paul Scherrer Institute, Switzerland 2003-2006

ACADEMIC APPOINTMENTS:

Faculty member, 2006 - Present
Biochemistry and Molecular Biology program, The University of Texas Health
Science Center, Graduate School of Biomedical Sciences

Assistant Professor tenure-track, 2006 - 2013
Center for Membrane Biology, Department of Biochemistry and Molecular Biology,
the University of Texas Medical School at Houston

Associate Professor with tenure, 2013 - Present
Center for Membrane Biology, Department of Biochemistry and Molecular Biology,
the University of Texas Medical School at Houston

PROFESSIONAL ORGANIZATIONS:

Member of American Biophysical Society, 2006 - Present
Member of American Crystallographic Association, 2009 - 2012
Member of American Society of Biochemistry and Molecular Biology, 2015-
Present
Member of American Heart Association, 2016 - Present

HONORS AND AWARDS:

Outstanding Research Award, PSI, Switzerland (2,500 Swiss Francs) 2004
Scientist Development Award, American Heart Association 2007

SERVICE ON NATIONAL GRANT REVIEW PANELS, STUDY SECTIONS, COMMITTEES:

Grant panelist, National Science Foundation, Catalysis and Biocatalysis section
2007
Ad hoc, National Science Foundation, Cell Biology section, 2011
Ad hoc, Germany Scientific Research Committee, 2015
Ad hoc, Israel-USA Scientific Research Foundation, 2016

SERVICE ON THE UNIVERSITY OF TEXAS-HOUSTON MEDICAL SCHOOL COMMITTEES:

Faculty Senator Committee 2011 – 2014
Radiation Safety Committee 2016 - Present

SERVICE ON GRADUATE SCHOOL COMMITTEES:

Student advisory committees: Haiying Ni 2009-2010; Sinyi Hou 2011
Student examination committees: Nam That 2008; Xiaofeng Zheng 2009;
Swarna Ramaswamy 2012; Rita Sirrieh 2012
Student supervisory committees: Jennifer Gonzalez 2008-2010; Sinyi Hou 2012;
Daisy Martinon 2012-2013, Nandini Rambahal, 2012-2013
Student lab rotation: Jungki Min, 2010

SERVICE TO THE COMMUNITY:

Manager of X-ray Crystallographic Facility, Department of Biochemistry and Molecular Biology, the University of Texas Medical School at Houston, 09/2010 - 2015

SPONSORSHIP OF POSTDOCTORAL FELLOWS:

Mousheng Wu, Ph.D., March, 2007 - Present (AHA postdoc fellowship, 07/2009 – 06/2012)

Shuilong Tong, Ph.D., May, 2009 - Present (AHA postdoc fellowship, 01/2012 – 12/2013)

Bing Li, Ph.D., March 2009 – Feb. 2010 (Supported by a fellowship from Shandong University, China)

Ranjan Singh, Ph.D. Nov. 2012 – May 2014

Shuo Lu, Ph.D., May 2015 – May 2017

Yibin Li, Ph.D., Oct. 2012 – now

CURRENT TEACHING RESPONSIBILITIES:

Graduate student Core course (Structural Biology topic) 2014-present

Graduate student course “Current Methods in Molecular Biology”, 2008 – Present

Medical student course “Biochemistry” Block I, 2009 – 2013

Graduate student course “Topics in Biochemistry and Molecular Biology”, 2011 - 2014

Graduate student course “Structure and Function of Biological Macromolecules”, 2009

CURRENT GRANT SUPPORT:

Project title: Ca²⁺ Transport Mechanism of CaCA Protein Family
1R01GM097290 NIGMS 04/2011 – 03/2018 (PI: Zheng)
Role: PI NCE

Project title: Phospholipid Metabolism in Cell Membrane
1R01GM098572 NIGMS 08/2012 - 04/2018 (PI: Zheng)
Role: PI NCE

PAST GRANT SUPPORT:

Project title: Structural and functional relationship of intracellular regulation mechanism of calcium/sodium exchangers

#0830353N American Heart Association National Center (PI: Zheng)

Role: PI, 15% effort 1/2008 - 12/2011

Annual direct cost: \$75,500

Project title: Structure and Function in Membrane Proteins
4R37GM020478-37 NIGMS 07/2011 – 06/2015 (PI: Dowhan)
Role: Co-investigator 10% effort

Project title: Structure and Function of Sulfate Transporter Proteins
UT Houston Medical School Pilot Grant (PI: Zheng)
Role: PI 07/01/2008 - 06/30/2009
Award amount: \$25,000

Project title: Supplement to parental grant R01GM097290
Role: PI NIGMS 10/1/2013 (PI: Zheng)
Direct cost: \$38,000

Project title: Scientific collaboration supplement to parental grant R01GM097290
1R01GM097290-S1 NIGMS 8/2014-3/2017 (PI: Zheng)
RO: PI
Direct cost total: \$152,793

Sponsored awards:

Postdoc Fellowship Award (Mousheng Wu)
Project title: Structural studies of Ca²⁺/Cation antiporter (CaCA) proteins
#09POST2260265 American Heart Association 07/2009 – 06/2011
Role: Sponsor
Annual award: \$45,000

Postdoc Fellowship 3rd Year Extension (Mousheng Wu)
Project title: Structural studies of Ca²⁺/Cation antiporter (CaCA) proteins
#09POST2260265 American Heart Association 07/2011 – 06/2012
Role: Sponsor
Annual award: \$45,000

Postdoc Fellowship Award (Shuilong Tong)
Project title: Structural study of lipid phosphate phosphatase
American Heart Association 1/2012 – 12/2013
Role: Sponsor
Annual award: \$45,000

Project title: Structural study of eukaryotic Ca²⁺ sodium exchanger protein
American Heart Association 01/2014-7/2015
Role: Sponsor (PI: Wu)

PUBLICATIONS:

A. Refereed Original Articles in Journals

1. Liu, Z., Yan, W., Xu, H., **Zheng, L.** and Luo X. (1997). Homology analysis of RubisCO gene of *Thiobacillus versutus* with extremely acidophilic *Thiobacilli*. *Acta. Microbiologica Sinica*. 37, 179-183.
2. Liu, Z, Yan, W., Xu, H. and **Zheng, L.** (1997). Construction of *Thiobacillus versutus* gene library and isolation of recombinant containing ribulose 1,5-biosphosphate carboxylase/oxygenase (RubisCO). *Chinese Microbiology*, 24, 99-103.
3. Liu, Z., Yan, W. and **Zheng, L.** (1997). Enzyme characterization and gene identification of ribulose 1,5-bisphosphate carboxylase/oxygenase from *Thiobacillus versutus*. *Acta. Appl. Environ. Biol.* 30, 361-365.
4. **Zheng, L.**, Baumann, U. & Reymond, J.-L. (2003). Production of a functional catalytic antibody ScFv-NusA fusion protein in bacterial cytoplasm. *J. Biochem.* **133**, 577-581.
5. **Zheng, L.**, Kostrewa, D., Berneche, S., Winkler, F. K. & Li, X.-D. (2004). The mechanism of ammonia transport based on the crystal structure of AmtB of *E.coli*. *Proc. Natl. Acad. Sci. U S A.* **101**, 17090-17095.
6. **Zheng, L.**, Baumann, U. & Reymond, J.-L. (2004). Molecular mechanism of enantioselective proton transfer to carbon in catalytic antibody 14D9. *Proc. Natl. Acad. Sci. U S A.* **101**, 3387-3392.
7. **Zheng, L.**, Baumann, U. & Reymond, J.-L. (2004). An efficient one-step site-directed and sitesaturation mutagenesis protocol. *Nucleic Acids Res.* **32**:e115.
8. **Zheng, L.**, Goddard, J.-P., Baumann, U. & Reymond, J.-L. (2004). Expression improvement and mechanistic study of the retro-diels-alderase catalytic antibody 10F11 by site-directed mutagenesis. *J. Mol. Biol.* **341**, 807-814.
9. Manetsch, R., **Zheng, L.**, Reymond, M. T., Woggon, W. D. & Reymond, J.-L. (2004). A catalytic antibody against a tocopherol cyclase inhibitor. *Chemistry* **10**, 2487-2506, 2004.
10. **Zheng, L.**, Manetsch, R., Woggon, W.-R., Baumann, U. & Reymond, J.-L. (2005) Mechanistic study of proton transfer in catalytic antibody 16E7 by site-directed mutagenesis and homology modeling. *Bioorg. Med. Chem.* **13**, 1021-1029.
11. Javelle, A., Lupo, D., **Zheng, L.**, Li, X.-D., Winkler, F. K. & Merrick, M. (2006) An unusual twin-His arrangement in the pore of ammonia channels is essential for substrate conductance. *J. Biol. Chem.* **281**, 39492-39498.
12. Wu, M., Wang, M., Nix, J., Hryshko, L.V. and **Zheng, L.** (2009) Crystal structure of CBD2 from the *Drosophila* Na⁺/Ca²⁺ exchanger: diversity of Ca²⁺ regulation and its alternative splicing modification. *J. Mol. Biol.* **387**, 104-112.
13. Wu, M., Le, H. D., Wang, M., Yurkov, V., Omelchenko, A., Hnatowich, M., Nix, J., Hryshko, L. V. and **Zheng L.** (2010) Crystal structures of progressive Ca²⁺ binding states of the Ca²⁺ sensor CBD1 from the CALX Na⁺/Ca²⁺ exchanger reveal incremental conformational transitions. *J. Biol. Chem.* **285**(4): 2554-61.

14. Wu, M., Tong, S., Ganzalez, J., Jayaraman, V, Spudich, J. L. and **Zheng, L.** (2011) Ca^{2+} inhibitory mechanism of *Drosophila*'s $\text{Na}^+/\text{Ca}^{2+}$ exchanger CALX and its modification by Alternative splicing. *Structure*. **19**, 1509-1717.
15. Wu, M., Tong, S., Waltersperger, S., Diederichs, K., Wang, M. and **Zheng, L.** (2013) Crystal structure of $\text{Ca}^{2+}/\text{H}^+$ antiporter protein YfkE reveals the mechanisms of Ca^{2+} efflux and its pH regulation. *Proc Natl Sci USA*. **110**, 11367-11372.
16. Lin, Y., Bogdanov, M., Tong, S., Guan, Z. and **Zheng, L.** (2016) Substrate Selectivity of Lysophospholipid Transporter LplT Involved in Membrane Phospholipid Remodeling in *Escherichia coli*. *J Biol Chem*. **291**:2136-49. 2016
17. Tong, S., Lin, Y., Lu, S., Wang, M., Bogdanov, M and **Zheng, L.** (2016) Structural insight into substrate selection and catalysis of lipid phosphate phosphatase PgpB in the cell membrane. *J Biol Chem*. **291**,18342-52.
18. **Zheng, L.***, Lin, Y., Lu, S., Zhang, J. and Bogdanov, M. (2017) Biogenesis, transport and remodeling of lysophospholipids in Gram-negative bacteria. *Biochem Biophys Acta. Molecular and Cell Biology of Lipids* **1862**, 1404-1413. (*corresponding author)

B. Invited Articles

19. Li X.D., Lupo D., **Zheng L.**, Winkler F. (2006). Structural and functional insights into the AmtB/Mep/Rh protein family. *Transfus Clin Biol*. **13**, 65-69.
20. Lin, Y., Lu, S., Bogdanov, M. and **Zheng, L.** Lysophospholipid flipping by membrane transporter LplT in bacteria. *BBA*. Invited review. submitted

C. Chapters

20. **Zheng, L.**, Wu, M. Tong, S. Structural studies of Ca^{2+} regulatory domain of *Drosophila* $\text{Na}^+/\text{Ca}^{2+}$ exchanger CALX. *Advances in Experimental Medicine and Biology*, Springer. 2013;961:55-63.

INVITED TALKS OR SEMINARS:

1. European Collaborative Operation of Science and Technology (COST) program, "catalyst and enzyme" section meeting, Bern, Switzerland. Oct. 2000
2. EMBO conference: Structure in Biology 2004, EMBL, Heidelberg, Germany. Nov. 12, 2004
3. Swiss National Center for Competitive Research in Structural Biology (NCCR) Seminar, ETH, Zurich, Switzerland. Dec. 10, 2004.
4. 3rd European Workshop on Challenging Proteins. Paris, France. Oct. 16-18 2005.
5. Invited seminar, Department of Biology, University of London, Queen Mary, London, UK, Nov. 17, 2005

6. Invited seminar, MRC-Laboratory of Molecular Biology, Cambridge, UK, Nov. 23, 2005.
7. Young Gun Seminar, UT Houston Medical School Feb. 6, 2007.
8. Seminar in Department of Biochemistry and Molecular Biology, UT Houston Medical School Feb.18, 2007.
9. Seminar in Department of Pathology and Laboratory Medicine, UT- Houston Medical School, March 23, 2007.
10. Golf Coast Consortium in Membrane Biology, Jan. 17, 2009. Houston
11. 6th International conference on Na⁺/Ca²⁺ exchange, Oct. 2 2011, Lacco Ameno, Ischia, Italy.
12. 58th annual biophysical meeting, 2014 Feb. 18, San Francisco, CA. co-chair in transporter and exchanger section.
13. 5th Cold Spring Harbor Symposium: Structural Biology from Atoms to Cells, June 2014, Suzhou, China
14. 7th International conference on sodium calcium exchange, Nov. 1-6, Jerusalem, Israel.
15. Membrane protein interest group seminar, NIH, Bethesda Oct. 2016