

Tingwei Mu, Ph.D.

Assistant Professor

Department of Physiology and Biophysics

Case Western Reserve University

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Education and Professional Experience

Case Western Reserve University Jan 2011 to present
Tenure-track Assistant Professor, Departments of Physiology and Biophysics
Research: Proteostasis of membrane proteins in health and disease

Case Western Reserve University Nov 2010 to Dec 2010
Visiting Assistant Professor, Departments of Physiology and Biophysics
Research: Proteostasis of membrane proteins in health and disease

The Scripps Research Institute Sep 2005 to Nov 2010
Postdoctoral Research Associate, Departments of Chemistry and Molecular and
Experimental Medicine, and the Skaggs Institute for Chemical Biology
Research: Adapting the protein homeostasis network to ameliorate protein-misfolding diseases
Advisor: Jeffery W. Kelly

California Institute of Technology Sep 2000 - Aug 2005
Ph.D., Department of Chemistry
Thesis: A chemical-scale structure-function study on ligand-gated ion channels
Advisor: Dennis A. Dougherty; *Co-advisor:* Henry A. Lester

University of Science and Technology of China Sep 1995 - July 2000
B.S., Department of Chemistry (00 Class)
Research Assistant: Elucidating molecular recognition in supramolecular systems
Advisor: Professor Qing-Xiang Guo Apr 1999 - July 2000

Professional Membership

- American Chemical Society (2001-)
- Biophysical Society (2005-)
- American Association for the Advancement of Science (2007-)
- American Society for Cell Biology (2010-)
- American Society for Mass Spectrometry (2012-)
- American Heart Association(2012-)
- American Society for Biochemistry and Molecular Biology (2013-)

Training Record*Postdoctoral Researchers*

- Dr. Dongyun Han, Spring 2011 to present
- Dr. Xiaojing Di, Fall 2011 to present

Ph.D. Students

- Yanlin (Kate) Fu, Spring 2012 to present, Physiology & Biophysics

Rotation Ph.D. Students

- Panjamaporn (Pam) Sangwung, Fall 2011 to Spring 2012, Physiology & Biophysics
- Qiuye Li, Fall 2013, Physiology & Biophysics
- Dong Liu, Fall 2014, Physiology & Biophysics

Qualifying Exam Committee member

- Michael Glidden, MD Ph.D. student, Physiology & Biophysics, August 2014

Master Students

- Brian McMains, entering 2013
- Justin Hixson, entering 2013
- Morgan AuCoin, entering 2013
- Kamal Sekhon, entering 2013

Summer Undergraduate Students

- Tracy Tabib, 2011, Biology, American University
- Renae Brown, 2012, Biology, CWRU
- Thomas Dreyer, 2014, Biology, Cedarville University

Collaborators

- Prof. Tomasz Religa, CWRU, Physiology and Biophysics
- Prof. Samden Lhatoo, Epilepsy Center, University Hospital

Teaching Activities

- PHOL402, *Physiology Basis for Disease*, Fall 2014
- *Medical School Medium Group Teaching*, Fall 2013, Spring 2014, Fall 2014
- PHOL456, *Proteins and Nucleic Acids*, Fall 2012
- PHOL483, *Translational Physiology I*, Fall 2011, Fall 2012
- PHOL476, *Cell Biophysics*, Spring 2011

Publications at Case Western Reserve University

1. Wang YJ, Tayo BO, Bandyopadhyay A, Wang H, Feng T, Franceschini N, Tang H, Gao J, COGENT consortium, Williams SM, Elston RC, Cooper RS, **Mu TW**, Zhu X (2014) The association of the vanin-1 N131S variant with blood pressure is mediated by endoplasmic-reticulum-associated degradation and loss of function. *PLoS Genetics*, in press
2. Wang YJ, Di XJ, **Mu TW** (2014) Using pharmacological chaperones to restore proteostasis (Review). *Pharmacological Research*, 83: 3-9. PMID: 24747662
3. Di XJ, Han DY, Wang YJ, Chance MR, **Mu TW** (2013) SAHA enhances proteostasis of epilepsy-associated $\alpha 1(A322D)\beta 2\gamma 2$ GABA_A receptors. *Chemistry & Biology*, 20: 1456-1468. doi: 10.1016/j.chembiol.2013.09.020. PubMed PMID: 24211135; PubMed Central PMCID: PMC3872227.
4. Wang YJ, Han DY, Tabib T, Yates JR, **Mu TW** (2013) Identification of GABA_C receptor protein homeostasis network components from three tandem mass spectrometry proteomics approaches. *Journal of Proteome Research*, 12: 5570-5586. doi: 10.1021/pr400535z. PubMed PMID: 24079818; PubMed Central PMCID: PMC3864119.

Publications from Scripps, Caltech and USTC

5. Ong DS, Wang YJ, Tan YL, Yates JR,* **Mu TW**,* Kelly JW* (2013) FKBP10 depletion enhances glucocerebrosidase proteostasis in Gaucher's disease fibroblasts. *Chemistry & Biology*, 20: 403-415. doi: 10.1016/j.chembiol.2012.11.014. PubMed PMID: 23434032; PubMed Central PMCID: PMC3624024. * corresponding author
6. Ong DS, **Mu TW**, Palmer AE, Kelly JW (2010) Endoplasmic reticulum Ca²⁺ increases enhance glucocerebrosidase folding, trafficking and function. *Nature Chemical Biology*, 6:424-432
7. **Mu TW**, Ong DS, Wang YJ, Balch WE, Yates JR, Segatori L, Kelly JW (2008) Chemical and biological approaches synergize to ameliorate protein-folding diseases. *Cell*, 134:769-791
8. **Mu TW**, Fowler DM, Kelly JW (2008) Partial restoration of mutant enzyme homeostasis in three distinct lysosomal storage disease cell lines by altering calcium homeostasis. *PLoS Biology*, 6: e26.
9. **Mu TW**, Lester HA, Dougherty DA (2003) Different binding orientations for the same agonist at homologous receptors: A lock and key or a simple wedge? *J Am Chem Soc*, 125: 6850-6851.
10. Feng Y, Liu L, **Mu TW**, Guo QX (2002) Influence of a hydrophobic environment on the structure of arginine-carboxylate salt bridge. *Chin J Chem* 20: 958-962.
11. **Mu TW**, Liu L, Li XS, Guo QX (2001) A theoretical study on the inclusion complexation of cyclodextrins with radical cations and anions. *J Phys Org Chem* 14: 559-565.
12. Zhang KC, **Mu TW**, Liu L, Guo QX (2001) A theoretical study on cucurbit[7]uril and its inclusion complexation. *Chin J Chem* 19: 558-561.

13. **Mu TW**, Liu L, Zhang KC, Guo QX (2001) A theoretical study on the stereoisomerism in the complex of cucurbit[8]uril with 2,6-bis(4, 5-dihydro-1H-imidazol-2-yl)naphthalene. *Chin Chem Lett* 12: 783-786.
14. Zhang KC, Liu L, **Mu TW**, Guo QX (2001) Ab initio calculations on the inclusion complexation of cyclobis(paraquat-p-phenylene). *Chem Phys Lett* 333: 195-198.
15. Zhang KC, Liu L, **Mu TW**, Guo QX (2001) Molecular modeling on the complexation of cyclobis(paraquat-p-phenylene) with tetrathiafulvalenes. *J Incl Phenom Macrocycl Chem* 40: 189-191.
16. Yang C, Liu L, **Mu TW**, Guo QX (2001) Improved accuracy and efficiency in the determination of association constants with the spectrophotometric method. *J Incl Phenom Macrocycl Chem* 39: 97-101.
17. **Mu TW**, Feng Y, Liu L, Guo QX (2001) On the structure of the arginine-carboxylate salt bridge: A density functional theory study. *Chin Chem Lett* 12: 219-222.
18. Liu L, Yang C, **Mu TW**, Guo QX (2001) A statistical examination on the compensation between the enthalpies and entropies obtained from the calorimetric methods. *Chin Chem Lett* 12: 167-170.
19. Zhang KC, Liu L, **Mu TW**, Guo QX (2000) A molecular modeling for the complexation of cyclobis(paraquat-p-phenylene) with substituted benzenes and biphenyls. *Chin Chem Lett* 11: 985-988.
20. Yang C, Liu L, **Mu TW**, Guo QX (2000) The performance of the Benesi-Hildebrand method in measuring the binding constants of the cyclodextrin complexation. *Anal Sci* 16: 537-539.
21. Liu L, Li XS, **Mu TW**, Guo QX, Liu YC (2000) Interplay between molecular recognition and redox properties: A theoretical study of the inclusion complexation of beta-cyclodextrin with phenothiazine and its radical cation. *J Incl Phenom Macrocycl Chem* 38: 199-206.
22. Li XS, Liu L, **Mu TW**, Guo QX, Liu YC (2000) A theoretical study on the structure and properties of phenothiazine derivatives and their radical cations. *Res Chem Intermed* 26: 375-384.
23. Li XS, Liu L, **Mu TW**, Guo QX (2000) A systematic quantum chemistry study on cyclodextrins. *Mon Chem* 131: 849-855.

Conferences and Presentations

- Membrane Protein Folding Meeting, Biophysics Society, Seoul, South Korea, May 2013
- Epilepsy Grand Rounds Seminar, Epilepsy Center, University Hospitals, CWRU, Nov 2012
- ASMS Annual Meeting, Vancouver, Canada, May 2012
- Invited Talk, ASIP Annual Meeting at Experimental Biology, San Diego, CA, Apr 2012
- Rammelkamp Research Conference, the MetroHealth System, CWRU, Apr 2012
- Cystic fibrosis Seminar, School of Medicine, Case Western Reserve University, Nov 2010
- Department of Biochemistry, University of Utah, Salt Lake City, UT, Jan 2010
- Department of Chemistry, Boston College, Chestnut Hill, MA, Dec 2009
- Department of Chemistry, Emory University, Atlanta, GA, Dec 2009
- Gordon Research Conferences on Stress Proteins, Andover, NH, Jul 2009

- Department of Pharmacology, Baylor College of Medicine, Houston, TX, Mar 2009
- Department of Chemistry, University of Florida, Gainesville, FL, Jan 2009
- Department of Chemistry, University of Pittsburgh, Pittsburgh, PA, Nov 2008
- Metachromatic Leukodystrophy Disease (MLD) Symposium, DeKalb, IL, Sep 2008
- The American Chemical Society 236th National Meeting, Philadelphia, Aug 2008
- The American Chemical Society 234th National Meeting, Boston, MA, Aug 2007
- The Biophysical Society 49th Annual Meeting, Long Beach, CA, Jun 2005
- Gordon Conferences: Ligand Recognition and Molecular Gating, Venture, CA, Mar 2004

Departmental Services

- Member, Committee for Appointments, Promotion and Tenure (CAPT), 2013-present
- Member, department retreat organization committee, 2012-present

External Services

- **Ad hoc Reviewer for Journals**
Molecular Neurobiology
ACS Chemical Biology
PLoS One
Molecular Biotechnology
International Journal of Molecular Sciences
- **Ad hoc Reviewer for Grants**
Center for Clinical and Translational Science (CCTS)
MRC Clinical Research Training Grant

Research Funding

- School of Medicine Faculty Startup Funds Nov. 2010 – present
Proteostasis of membrane proteins in health and disease
 The long term goal is to understand the proteostasis of important classes of membrane proteins, including GABA receptors, hERG channels, and GPI-anchored membrane proteins.
 Role: PI Amount: \$1,200,000
- Epilepsy Foundation Research Grant Tingwei Mu (PI) 01/01/2012-12/31/2012
 The goal of this project is to manipulate the endoplasmic reticulum-associated degradation pathway to enhance GABA_A receptor protein homeostasis.
 Role: PI Amount: \$50,000
- CTSC Pilot Core Utilization Grant Tingwei Mu (PI) 03/01/2012-10/31/2012
 The goal of this project is to use tandem MS proteomics analysis to identify GABA_A receptor protein homeostasis network components.
 Role: PI Amount: \$9,900