

## REFERENCES

1. Yeagle, P. L., Lipid regulation of cell membrane structure and function. *The FASEB Journal* **1989**, *3* (7), 1833-42.
2. Perozo, E.; Rees, D. C., Structure and mechanism in prokaryotic mechanosensitive channels. *Current opinion in structural biology* **2003**, *13* (4), 432-42.
3. Singer, S. J.; Nicolson, G. L., The fluid mosaic model of the structure of cell membranes. *Science* **1972**, *175* (4023), 720-31.
4. Terlau, H.; Stühmer, W., Structure and Function of Voltage-Gated Ion Channels. *Naturwissenschaften* **1998**, *85* (9), 437-444.
5. Jegla, T. J.; Zmasek, C. M.; Batalov, S.; Nayak, S. K., Evolution of the human ion channel set. *Combinatorial chemistry & high throughput screening* **2009**, *12* (1), 2-23.
6. Aidley, D. J.; Stanfield, P. R., *Ion Channels: Molecules in Action*. Cambridge University Press: 1996.
7. Yu, F. H.; Yarov-Yarovoy, V.; Gutman, G. A.; Catterall, W. A., Overview of molecular relationships in the voltage-gated ion channel superfamily. *Pharmacological reviews* **2005**, *57* (4), 387-95.
8. Chanda, B.; Bezanilla, F., A common pathway for charge transport through voltage-sensing domains. *Neuron* **2008**, *57* (3), 345-51.
9. Martinac, B., Mechanosensitive ion channels: molecules of mechanotransduction. *Journal of cell science* **2004**, *117* (Pt 12), 2449-60.
10. Booth, I.; Miller, S.; Rasmussen, A.; Rasmussen, T.; Edwards, M., Mechanosensitive Channels: Their Mechanisms and Roles in Preserving Bacterial Ultrastructure During Adaptation to Environmental Changes. In *Bacterial Physiology*, El-Sharoud, W., Ed. Springer Berlin Heidelberg: 2008; pp 73-95.
11. Alberts, B., *Molecular Biology of the Cell: Reference edition*. Garland Science: 2008.
12. Kloda, A.; Petrov, E.; Meyer, G. R.; Nguyen, T.; Hurst, A. C.; Hool, L.; Martinac, B., Mechanosensitive channel of large conductance. *The International Journal of Biochemistry & Cell Biology* **2008**, *40* (2), 164-169.



13. Booth, I. R.; Edwards, M. D.; Black, S.; Schumann, U.; Miller, S., Mechanosensitive channels in bacteria: signs of closure? *Nat Rev Micro* **2007**, *5* (6), 431-440.
14. Yoshimura, K.; Sokabe, M., Mechanosensitivity of ion channels based on protein-lipid interactions. *Journal of the Royal Society, Interface / the Royal Society* **2010**, *7* Suppl 3, S307-20.
15. Chang, G.; Spencer, R. H.; Lee, A. T.; Barclay, M. T.; Rees, D. C., Structure of the MscL homolog from *Mycobacterium tuberculosis*: a gated mechanosensitive ion channel. *Science* **1998**, *282* (5397), 2220-6.
16. Blount, P.; Iscla, I.; Li, Y., Mechanosensitive Channels and Sensing Osmotic Stimuli in Bacteria. In *Sensing with Ion Channels*, Martinac, B., Ed. Springer Berlin Heidelberg: 2008; Vol. 11, pp 25-45.
17. Booth, I. R.; Blount, P., The MscS and MscL families of mechanosensitive channels act as microbial emergency release valves. *Journal of bacteriology* **2012**, *194* (18), 4802-9.
18. Klug, C. S.; Feix, J. B., Methods and applications of site-directed spin labeling EPR spectroscopy. *Methods in cell biology* **2008**, *84*, 617-58.
19. Klare, J.; Steinhoff, H.-J., Spin labeling EPR. *Photosynth Res* **2009**, *102* (2-3), 377-390.
20. Strancar, J.; Kavalenka, A.; Urbancic, I.; Ljubetic, A.; Hemminga, M. A., SDSL-ESR-based protein structure characterization. *European biophysics journal : EBJ* **2010**, *39* (4), 499-511.
21. Perozo, E.; Kloda, A.; Cortes, D. M.; Martinac, B., Physical principles underlying the transduction of bilayer deformation forces during mechanosensitive channel gating. *Nature structural biology* **2002**, *9* (9), 696-703.
22. Jensen, M. O.; Mouritsen, O. G., Lipids do influence protein function-the hydrophobic matching hypothesis revisited. *Biochimica et biophysica acta* **2004**, *1666* (1-2), 205-26.
23. Strandberg, E.; Esteban-Martin, S.; Ulrich, A. S.; Salgado, J., Hydrophobic mismatch of mobile transmembrane helices: Merging theory and experiments. *Biochimica et biophysica acta* **2012**, *1818* (5), 1242-9.
24. Perozo, E.; Cortes, D. M.; Sompornpisut, P.; Kloda, A.; Martinac, B., Open channel structure of MscL and the gating mechanism of mechanosensitive channels. *Nature* **2002**, *418* (6901), 942-8.



2432385467

25. Sompornpisut, P.; Roux, B.; Perozo, E., Structural refinement of membrane proteins by restrained molecular dynamics and solvent accessibility data. *Biophysical journal* **2008**, *95* (11), 5349-61.
26. Li, J., Basic Molecular Dynamics. In *Handbook of Materials Modeling*, Yip, S., Ed. Springer Netherlands: 2005; pp 565-588.
27. Karplus, M.; McCammon, J. A., Molecular dynamics simulations of biomolecules. *Nat Struct Mol Biol* **2002**, *9* (9), 646-652.
28. Grotendorst, J.; Marx, D.; Muramatsu, A., *Quantum simulations of complex many-body systems: from theory to algorithms: Winterschool, 25 February - 1 March 2002, Rolduc Conference Centre, Kerkrade, The Netherlands : poster presentations*. NIC Directors: 2002.
29. Maple, J. R.; Dinur, U.; Hagler, A. T., Derivation of force fields for molecular mechanics and dynamics from ab initio energy surfaces. *Proceedings of the National Academy of Sciences* **1988**, *85* (15), 5350-5354.
30. González, M. A., Force fields and molecular dynamics simulations. *JDN* **2011**, *12*, 169-200.
31. Beck, D. A.; Daggett, V., Methods for molecular dynamics simulations of protein folding/unfolding in solution. *Methods (San Diego, Calif.)* **2004**, *34* (1), 112-20.
32. Barh, D.; Zambare, V.; Azevedo, V., *OMICS: Applications in Biomedical, Agricultural, and Environmental Sciences*. Taylor & Francis: 2013.
33. Balbuena, P.; Seminario, J. M., *Molecular Dynamics: From Classical to Quantum Methods*. Elsevier Science: 1999.
34. Hug, S., Classical molecular dynamics in a nutshell. *Methods in molecular biology (Clifton, N.J.)* **2013**, *924*, 127-52.
35. Darden, T.; York, D.; Pedersen, L., Particle mesh Ewald: An  $N \cdot \log(N)$  method for Ewald sums in large systems. *The Journal of Chemical Physics* **1993**, *98* (12), 10089-10092.
36. Kalé, L.; Skeel, R.; Bhandarkar, M.; Brunner, R.; Gursoy, A.; Krawetz, N.; Phillips, J.; Shinozaki, A.; Varadarajan, K.; Schulten, K., NAMD2: Greater Scalability for Parallel Molecular Dynamics. *Journal of Computational Physics* **1999**, *151* (1), 283-312.
37. Humphrey, W.; Dalke, A.; Schulten, K., VMD: visual molecular dynamics. *Journal of molecular graphics* **1996**, *14* (1), 33-8, 27-8.
38. Andersen, C. A.; Bohr, H.; Brunak, S., Protein secondary structure: category assignment and predictability. *FEBS letters* **2001**, *507* (1), 6-10.



243285467

เลขหมู่..... 2576  
 เลขทะเบียน..... 7123  
 วันเดือนปี..... 16 มี.ค. 2560

39. Smart, O. S.; Neduelil, J. G.; Wang, X.; Wallace, B. A.; Sansom, M. S. P., HOLE: A program for the analysis of the pore dimensions of ion channel structural models. *Journal of molecular graphics* **1996**, *14* (6), 354-360.
40. Kong, Y.; Shen, Y.; Warth, T. E.; Ma, J., Conformational pathways in the gating of Escherichia coli mechanosensitive channel. *Proceedings of the National Academy of Sciences of the United States of America* **2002**, *99* (9), 5999-6004.
41. Kucerka, N.; Liu, Y.; Chu, N.; Petrache, H. I.; Tristram-Nagle, S.; Nagle, J. F., Structure of fully hydrated fluid phase DMPC and DLPC lipid bilayers using X-ray scattering from oriented multilamellar arrays and from unilamellar vesicles. *Biophysical journal* **2005**, *88* (4), 2626-2637.
42. Sukharev, S. I.; Sigurdson, W. J.; Kung, C.; Sachs, F., Energetic and spatial parameters for gating of the bacterial large conductance mechanosensitive channel, MscL. *The Journal of general physiology* **1999**, *113* (4), 525-40.
43. Liu, Z.; Gandhi, C. S.; Rees, D. C., Structure of a tetrameric MscL in an expanded intermediate state. *Nature* **2009**, *461* (7260), 120-4.



2432385467

## VITA

### Personal Data:

First Name: Mr.Jarewat    Last Name: Jakmunee

Date of birth: May 10, 1982

Citizenship: Thai

Religion: Buddhism

Domicile/Habitation: Nakornsrihammarat

Gender: Male

Primary Phone: 086-540-6184

E-mail address: basicinstincttom@gmail.com

Home Address: 27 Soi 3, Poolsiri road, Nasa

District: Bannasan State/Province: Suratthani Postal Code:20230

Country: Thailand

### Education:

2011-Present: Master's Degree in Science, Major Chemistry  
(Physical chemistry), Chulalongkorn University, Thailand.

2004-2007: Bachelor's Degree in Science, Major Chemistry,  
Prince of Songkhla University, Thailand.

2002-2004: High School from Suratthani school, Suratthani, Thailand

2000-2002: Junior High School from Municipality Watthapare  
school, Nakornsrihammarat, Thailand.

### Experience:

2008-Present: Teacher assistant at faculty of Science at sriracha,  
Kasetsart University, Sriracha campus.



Research Interest:

2011-Present: Structure Models of Mechanosensitive Channel  
from Accessibility Data and Molecular Dynamics Simulation.

The full paper (Proceeding) and publication:

2013: Structure and Dynamics Investigation of Closed-State Mscl  
Using EPR Data and MD Simulations.

