



YUEXIAO SHEN
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EDUCATIONAL HISTORY

The Pennsylvania State University, Chemical Engineering, PhD Candidate	2011-present
Advisor: Dr. Manish Kumar	
Tsinghua University, Environmental Engineering, Master of Science	2009-2011
Advisor: Dr. Xia Huang	
Tsinghua University, Water Supply and Sewer System Engineering, Bachelor of Science	2005- 2009
Top student in class, 1 of 77	

RESEARCH EXPERIENCE

Doctoral projects:

- Development of artificial water channel based membranes for desalination and other environmental applications.
- Supported biomimetic desalination membranes based on incorporation of aquaporins into lipids and block copolymers.

Master's projects:

- Physicochemical and biological properties of mixed liquor in full-scale Membrane Bioreactors (MBRs) for municipal wastewater treatment, master thesis, 03/2010-06/2011
- Technologies and demonstration project on water environmental protection in rapid developing and urbanized areas in China, 10/2009-06/2011
- Collecting materials for 'The MBR Book: Principles and Applications of Membrane Bioreactors for Water and Wastewater Treatment' (Second Edition by Dr. Simon Judd), 01/2010

Undergraduate projects:

- Membrane fouling in a membrane bioreactor coupled with anaerobic-anoxic-oxic process for coke wastewater treatment, undergraduate thesis, 03/2009-06/2009
- Membrane fouling in MBR and MBR-NF system, 10/2007-06/2009
- Phosphorus removal in an Sequencing Batch Reactor (SBR), 07/2007-08/2007
- Particulate matter (PM) and its health impact in Beijing, 09/2006-06/2007

AWARDS & HONORS

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- American Institute of Chemical Engineers (AIChE) Separations Division Graduate Student Research Award, 2014 [\[link\]](#)
 - One of the 8 student delegates selected nationwide for the Council for Chemical Research Conference, 2014
 - Teaching Fellow, Chemical Engineering Undergraduate Unit operations Laboratory Class, Penn State, 2014
 - Leighton Reiss Graduate Fellowship, Penn State, 2013
 - **Shen, Y.**, Saboe, P., Ferlez, B., Erbakan, M. & Escotet, M. Solar energy based biomimetic water desalination and purification. Dow Sustainability Innovation Challenge. 2nd Prize at Penn State, 2012
 - **Shen, Y.**, Saboe, P., Ferlez, B., Erbakan, M. & Escotet, M. Solar energy based biomimetic water desalination and purification. 28th Annual Graduate Exhibition at Penn State. 2nd Prize, 2013
 - Larson Aquatic Research Support Doctoral Scholarship, American Water Works Association, 2012
 - The First-Class Scholarship of Tsinghua-Meishang International Scholarship, 2010
 - Excellent undergraduate students in Tsinghua University, 2009
 - Excellent undergraduate thesis, Tsinghua University, 2009
 - Member of youngsters' scientific and technological innovation plan in Tsinghua University, 2008-2009
 - National Scholarship, China, 2007 and 2008
 - The First-Class Scholarship of Tsinghua-POSCO Scholarship, 2006

PUBLICATIONS

In preparation

1. **Shen, Y.**, Erbakan, M., Decker, K., Butler, P., Aksimentiev, A., Hou, J. & Kumar, M. Highly Permeable Artificial Water Channels.. (in preparation)
2. **Shen, Y.**, Sun, Y., Yang, Y., Zhou, J. & Huang, X. Functional gene diversity of microbial communities in 10 large-scale membrane bioreactors for municipal wastewater treatment in China. *ISME J.* (in preparation)
3. Grzelakowski, M., Cherenet, M., **Shen, Y.** and Kumar, M. A framework for accurate evaluation of the promise of aquaporin based biomimetic membranes. (submitted to *J. Membr. Sci.*)

Published

4. Xiao, K., **Shen, Y.**, Liang, S., Liang, P., Wang, X., & Huang, X. A systematic analysis of fouling evolution and irreversibility behaviors of MBR supernatant hydrophilic/hydrophobic fractions during microfiltration. *J. Membr. Sci.* 467, 206-216 (2014). [\[link\]](#)
5. Sun, Y., **Shen, Y.**, Liang, P., Zhou, J., Yang, Y. & Huang, X. Linkages between microbial functional potential and wastewater constituents in large-scale membrane bioreactors for municipal wastewater treatment. *Water Res.* 56, 162-171 (2014). (Co-first author). [\[link\]](#)
6. Erbakan, M., **Shen, Y.**, Grzelakowski, M., Butler, P., Kumar, M, Curtis, W. Molecular Cloning, Overexpression and Characterization of a Novel Water Channel Protein from *Rhodobacter sphaeroides*, *Plos One.* 9, e86830 (2014). [\[link\]](#)
7. Kaufman, Y., Grinberg, S., Linder, C., Heldman, E., Gilron, J., **Shen, Y.**, Kumar, M., Lammertink, R. & Freger, V. Towards

- supported bolaamphiphile membranes for water filtration: Roles of lipid and substrate. *J. Membr. Sci.* 457, 50-61 (2014). [[link](#)]
8. **Shen, Y.**, Saboe, P., Sines, I., Erbakan, M. & Kumar, M. Biomimetic membranes: A review. *J. Membr. Sci.* 454, 359-381 (2014). [[link](#)]
 9. Sun, J., Xiao, K., Mo Y., Liang, P., **Shen, Y.**, Zhu, N. & Huang, X. Seasonal characteristics of supernatant organics and its effect on membrane fouling in a full-scale membrane bioreactor. *J. Membr. Sci.* 453, 168-174 (2014). [[link](#)]
 10. **Shen, Y.**, Xiao, K., Liang, P., Ma, Y. & Huang, X. Improvement on Modified Lowry Method against Interference by divalent cations for soluble protein measurement in wastewater systems. *Appl. Microbiol. Biotechnol.* 97, 4167-4178 (2013). [[link](#)]
 11. Kumar, M., Habel, J., **Shen, Y.**, Meier, W.P. & Walz, T. High-density reconstitution of functional water channels into vesicular and planar block copolymer membranes. *J. Am. Chem. Soc.* 134, 18631-18637 (2012). [[link](#)]
 12. Xiao, K., **Shen, Y.** & Huang, X. An analytical model for membrane fouling evolution associated with gel layer growth during constant pressure stirred dead-end filtration. *J. Membr. Sci.* 427, 139-149 (2013). [[link](#)]
 13. Kumar, M., **Shen, Y.** & Saboe P. Biological and biomimetic membranes. In *Encyclopedia of Membrane Science and Technology*, Eds. V. Tarabara and E. Hoek, Wiley Interscience. [[link](#)]
 14. **Shen, Y.**, Xiao, K., Liang, P., Sun, J., Sai, S. & Huang, X. Characterization of soluble microbial products in 10 large-scale membrane bioreactors for municipal wastewater treatment in China. *J. Membr. Sci.* 415-416, 336-345 (2012). [[link](#)]
 15. Mo, Y., Xiao, K., **Shen, Y.** & Huang, X. A new perspective on the effect of complexation between calcium and alginate on fouling during nanofiltration. *Sep. Purif. Technol.* 82, 121-127 (2011). [[link](#)]
 16. Huang, X., Xiao, K. & **Shen, Y.** Recent advances in membrane bioreactor technology for wastewater treatment in China. *Front. Environ. Sci. Eng. China* 4, 245-271 (2010). [[link](#)]
 17. **Shen, Y.**, Zhao, W., Xiao, K. & Huang, X. A systematic insight into fouling propensity of soluble microbial products in membrane bioreactors based on hydrophobic interaction and size exclusion. *J. Membr. Sci.* 346, 187-193 (2010). [[link](#)]
 18. Zhao, W., **Shen, Y.**, Xiao, K. & Huang, X. Fouling characteristics in a membrane bioreactor coupled with anaerobic-anoxic-oxic process for coke wastewater treatment. *Bioresour. Technol.* 101, 3876-3883 (2010). [[link](#)]
 19. Zhao, W., Huang, X., Lee, D., Wang, X. & **Shen, Y.** Use of submerged anaerobic-anoxic-oxic membrane bioreactor to treat highly toxic coke wastewater with complete sludge retention. *J. Membr. Sci.* 330, 57-64 (2009). [[link](#)]

CONFERENCE PRESENTATIONS AND POSTERS

1. **Shen, Y.**, Erbakan, M., Decker, K., Aksimentiev, A., Hou, J. & Kumar, M. Artificial Water Channels—Can they reach the performance of biological channels? Membranes: Materials & Processes, Gordon Research Seminar, New London, NH, July 2014. (**invited talk** and poster)
2. **Shen, Y.**, Erbakan, M., Decker, K., Aksimentiev, A., Hou, J. & Kumar, M. Artificial Water Channels—Can they reach the performance of biological channels? 24th Annual North American Membrane Society Meeting, Houston, TX, July 2014.
3. **Shen, Y.**, Erbakan, M., Meminger, C., Hou, J. & Kumar, M. Single Molecule Transport Characterization of a High Permeable Artificial Water Channel. Council for Chemical Research Annual Meeting, Alexandria, VA, USA, 2014. (**invited talk**)
4. Feroz, H., **Shen, Y.**, Ferlez, B., Golbeck, J. & Kumar, M. Light driven ion pumps for desalination. 24th Annual North American Membrane Society Meeting, Houston, TX, July 2014. (poster)
5. **Shen, Y.**, Sines, I., Licsandru, E., Barboiu, M. & Kumar, M. Functional reconstitution and characterization of artificial water channels for desalination. 246th ACS National Meeting & Exposition, Indianapolis, IN, September 2013.
6. **Shen, Y.**, Licsandru, E., Barboiu, M. & Kumar, M. Functional reconstitution and characterization of artificial water channels for desalination. 50th AEESP Anniversary Conference, Golden, CO, July 2013. (poster)
7. **Shen, Y.**, Licsandru, E., Barboiu, M. & Kumar, M. Functional reconstitution and characterization of artificial water channels for desalination. 23rd Annual North American Membrane Society Meeting, Boise, ID, July 2013. (poster)
8. Feroz, H., **Shen, Y.**, Ferlez, B., Golbeck, J. & Kumar, M. Light driven desalination membranes. 23rd Annual North American Membrane Society Meeting, Boise, ID, July 2013. (poster)
9. **Shen, Y.**, Edwards, A., Saboe, P., Erbakan, M. & Kumar, M. Supported lipid-aquaporin-crystal based biomimetic membranes for desalination. Membranes: Materials & Processes, Gordon Research Conference and Seminar, New London, NH, August 2012. (poster)
10. **Shen, Y.**, Xiao, K., Liang, P., Sun, J., Sai, S. & Huang, X. Soluble microbial products in 10 large-scale membrane bioreactors for municipal wastewater treatment in China: Physicochemical properties and fouling propensity. 6th IWA Conference on Membranes for Water and Wastewater Treatment, Aachen, Germany, September 2011.
11. **Shen, Y.**, Ma, Y., Liang, P. & Huang, X. Improvement on Modified Lowry Methods against interference by divalent cations for soluble protein quantitation in wastewater systems. 3rd IWA Asia Pacific Young Water Professionals Conference, Singapore, November 2010.
12. **Shen, Y.**, Zhao, W., Xiao, K. & Huang, X. A new insight into fouling propensity of soluble microbial products in membrane bioreactors based on hydrophobic interaction and size exclusion. 5th IWA Conference on Membranes for Water and Wastewater Treatment. Beijing, China, September 2009.

PROFESSIONAL MEMBERSHIPS, SERVICE AND ACTIVITIES

1. Mentor of Science U H2uhOH! Water Camp, Penn State, 2014
2. Co-Lecturer, Teaching Apprentice (ChE 480 Chemical Engineering Laboratory), Penn State, Spring, 2014
3. Mentor of Science U H2uhOH! Water Camp, Penn State, 2013
4. Teaching Assistantship (ChE 480 Chemical Engineering Laboratory), Penn State, Fall, 2013.
5. North American Membrane Society member, 2012-present
6. ACS member, 2012-present