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EDUCATION

YALE UNIVERSITY, New Haven, CT, USA Department of Chemical and Environmental Engineering Environmental Engineering Program	2009 – 2014
<ul style="list-style-type: none"> • Doctor of Philosophy, May 2014 • Masters of Philosophy, May 2011 • Masters of Science, May 2011 	
NANYANG TECHNOLOGICAL UNIVERSITY (NTU), Singapore Department of Civil and Environmental Engineering	2000 – 2004
<ul style="list-style-type: none"> • Bachelor of Engineering (First Class Honors) • Minor in Business Administration 	

ACADEMIC APPOINTMENTS and PROFESSIONAL EXPERIENCE

COLUMBIA UNIVERSITY, New York, NY, USA Assistant Professor (tenure track) Department of Earth and Environmental Engineering	2015 –
Adjunct Associate Research Scientist Department of Earth and Environmental Engineering	2014 – 2015
SCELS (Singapore Centre on Environmental Life Sciences Engineering), NTU, Singapore Postdoctoral Research Fellow	2014 – 2015
National Environment Agency, Singapore Assistant Manager	2004 – 2008

ACHIEVEMENTS AND AWARDS (selected)

Outstanding Doctoral Dissertation Award CH2M Hill/AEESP	2015
Henry Prentiss Becton Graduate Prize Yale School of Engineering and Applied Science	2015
ES&T Best Papers of 2013 Environmental Technology: Second Runner-up	2014
C. Ellen Gonter Best Paper Award Division of Environmental Chemistry, American Chemical Society	2013
First Place, Student Presentation Competition 10 th Annual Robert M. Langer Symposium, Yale University	2012
Environmental Chemistry Graduate Student Award Division of Environmental Chemistry, American Chemical Society	2011
Membrane X-Prize Oasys Water Inc., Boston, MA Monetary award for development of prototype forward osmosis membranes	2010

PUBLICATIONS

h-index: 19

21. Straub, A.P., Yip, N.Y., Lin, S., Lee, J., and Elimelech, M., "Harvesting low-grade heat energy using thermo-osmotic vapor transport through nanoporous membranes", *Nature Energy*, submitted.
20. Deshmukh, A., Yip, N.Y., Lin, S., and Elimelech, M., "Desalination by Forward Osmosis: Identifying Performance Limiting Parameters through Module Scale Modeling", *Journal of Membrane Science*, October 2015, Volume 491, 159–167.
19. Yip, N.Y. and Elimelech, M., "Comparison of Energy Efficiency and Power Density in Pressure Retarded Osmosis and Reverse Electrodialysis", *Environmental Science & Technology*, Volume 48, September 2014, 11002–11012.
18. Yip, N.Y. and Elimelech, M., "Thermodynamic, Energy Efficiency, and Power Density Analysis of Reverse Electrodialysis Power Generation with Natural Salinity Gradients", *Environmental Science & Technology*, Volume 48, May 2014, 4925–4936.
17. Lin, S., Yip, N.Y., and Elimelech, M., "Hybrid Pressure Retarded Osmosis-Membrane Distillation System for Power Generation from Low-Grade Heat: Thermodynamic Analysis and Energy Efficiency", *Environmental Science & Technology*, April 2014, Volume 48, 5306–5313.
16. Lin, S., Yip, N.Y., Cath, T.Y., and Elimelech, M., "Direct Contact Membrane Distillation with Heat Recovery: Thermodynamic Insights from Module Scale Modeling", *Journal of Membrane Science*, March 2014, Volume 453, 498–515.

15. Straub, A.P., Yip, N.Y., and Elimelech, M., "Raising the Bar: Increased Hydraulic Pressure Allows Unprecedented High Power Densities in Pressure-Retarded Osmosis", *Environmental Science & Technology Letters*, November 2013, Volume 1, 55–59.
14. Yip, N.Y. and Elimelech, M., "Influence of Natural Organic Matter Fouling and Osmotic Backwash on Pressure Retarded Osmosis Energy Production from Natural Salinity Gradients", *Environmental Science & Technology*, Volume 47, November 2013, 12607–12616.
13. Vermaas, D.A., Veerman, J., Yip, N.Y., Elimelech, M., Saakes, M., and Nijmeijer, K., "High Efficiency in Energy Generation from Salinity Gradients with Reverse Electrodialysis", *ACS Sustainable Chemistry & Engineering*, October 2013, Volume 1, 1295–1302.
12. Tiraferri, A., Yip, N.Y., Straub, A.P., Romero-Vargas Castrillon, S., and Elimelech M., "A Method for the Simultaneous Determination of Transport and Structural Parameters of Forward Osmosis Membranes", *Journal of Membrane Science*, October 2013, Volume 444, 523–538.
11. Shaffer, D.L., Arias Chavez, L.H., Ben-Sasson, M., Romero-Vargas Castrillón, S., Yip, N.Y., and Elimelech, M., "Desalination and Reuse of High-Salinity Shale Gas Produced Water: Drivers, Technologies, and Future Directions", *Environmental Science & Technology*, September 2013, Volume 47, 9569–9583.
10. Cath, T.Y., Elimelech, M., McCutcheon, J.R., McGinnis, R.L., Achilli, A., Anastasio, D., Brady, A.R., Childress, A.E., Farr, I.V., Hancock, N.T., Lampi, J., Nghiem, L.D., Xie, M., and Yip, N.Y., "Standard Methodology for Evaluating Membrane Performance in Osmotically Driven Membrane Processes", *Desalination*, March 2013, Volume 312, 31–38.
9. Mo, Y., Tiraferri, A., Yip, N.Y., Adout, A., Huang, X., and Elimelech, M., "Improved Antifouling Properties of Polyamide Nanofiltration Membranes by Reducing the Density of Surface Carboxyl Groups", *Environmental Science & Technology*, December 2012, Volume 46, 13253–13261.
8. Shaffer, D.L., Yip, N.Y., Gilron J., and Elimelech, M., "Seawater Desalination for Agriculture by Integrated Forward and Reverse Osmosis: Improved Product Water Quality for Potentially Less Energy", *Journal of Membrane Science*, October 2012, Volume 415–416, 1–8.
7. Yip, N.Y., and Elimelech, M., "Thermodynamic and Energy Efficiency Analysis of Power Generation from Natural Salinity Gradients by Pressure Retarded Osmosis", *Environmental Science & Technology*, Volume 46, May 2012, 5230–5239.
6. Hoover, L.A., Phillip, W.A., Tiraferri, A., Yip, N.Y., and Elimelech, M., "Forward with Osmosis: Emerging Applications for Greater Sustainability", *Environmental Science & Technology*, December 2011, Volume 45, 9824–9830.
5. Yip, N.Y. and Elimelech, M., "Performance Limiting Effects in Power Generation from Salinity Gradients by Pressure Retarded Osmosis", *Environmental Science & Technology*, Volume 45, December 2011, 10273–10282.
4. Ang, W.S., Yip, N.Y., Tiraferri, A., and Elimelech, M., "Chemical Cleaning of RO Membranes Fouled by Wastewater Effluent: Achieving Higher Efficiency with Dual-step Cleaning", *Journal of Membrane Science*, Volume 382, October 2011, 100–106.

3. Yip, N.Y., Tiraferri, A., Phillip, W.A., Schiffman, J.D., Laura, A.H., Kim, Y.C., and Elimelech, M., "Thin-Film Composite Pressure Retarded Osmosis Membranes for Sustainable Power Generation from Salinity Gradients", *Environmental Science & Technology*, Volume 45, May 2011, 4360–4369.
2. Tiraferri, A., Yip, N.Y., Phillip, W.A., Schiffman, J.D., and Elimelech, M., "Relating Performance of Thin-Film Composite Forward Osmosis Membranes to Support Layer Formation and Structure", *Journal of Membrane Science*, Volume 367, February 2011, 340-352.
1. Yip, N.Y., Tiraferri, A., Phillip, W.A., Schiffman, J.D., and Elimelech, M., "High Performance Thin-Film Composite Forward Osmosis Membrane", *Environmental Science & Technology*, Volume 44, May 2010, 3812–3818.

INVITED SEMINARS and CONFERENCES (selected)

12. Yip, N.Y. "Harnessing Natural Salinity Gradients for Sustainable Power Generation with Pressure Retarded Osmosis", *Invited Seminar*, Department of Civil, Structural and Environmental Engineering, University at Buffalo, Buffalo, NY, October 2015.
11. Yip, N.Y. "Harnessing Natural Salinity Gradients for Sustainable Power Generation with Pressure Retarded Osmosis", *Invited Seminar*, Department of Civil and Environmental Engineering, Rice University, Houston, TX, December 2013.
10. Yip, N.Y. and Elimelech, M. "Influence of Natural Organic Matter Fouling and Osmotic Backwash on Pressure Retarded Osmosis Energy Production from Natural Salinity Gradients", *246th ACS National Meeting & Exposition*, Indianapolis, IN, September 2013.
9. Yip, N.Y., Tiraferri, A., Phillip, W.A., Schiffman, J.D., Hoover, L.A., and Elimelech, M. "Energy Production with Salinity Gradients by Pressure Retarded Osmosis", *246th ACS National Meeting & Exposition*, Indianapolis, IN, September 2013.
8. Yip, N.Y. and Elimelech, M. "Impact of Natural Organic Matter Fouling on Pressure Retarded Osmosis Energy Production with Natural Salinity Gradients", *2013 AEESP 50th Anniversary Conference*, Golden, CO, July 2013.
7. Yip, N.Y., and Elimelech, M. "Pressure Retarded Osmosis Energy Production with Natural Salinity Gradients", *North American Membrane Society 22nd Annual Meeting*, New Orleans, LA, June 2012.
6. Yip, N.Y., and Elimelech, M. "Thermodynamic and Energy Efficiency Analysis of Power Generation from Salinity Gradients by Pressure Retarded Osmosis", *Technoport 2012 – Sharing Possibilities, Renewable Energy Research Conference*, Trondheim, Norway, April 2012.
5. Yip, N.Y. "Engineered Osmosis for Sustainable Water and Energy Production: Membrane Development", *Invited Seminar*, Department of Chemical and Biomolecular Engineering, National University of Singapore, Singapore, February 2012.
4. Yip, N.Y. "Engineered Osmosis for Sustainable Water and Energy Production", *Invited Seminar*, School of Civil and Environmental Engineering, Nanyang Technological University, Singapore, February 2012.

3. Yip, N.Y., Tiraferri, A., Phillip, W.A., Schiffman, J.D., and Elimelech, M. "Thin-film Composite Membranes for Osmotically-Driven Processes", *8th IWA Leading-Edge Conference on Water and Wastewater Technologies*, Amsterdam, The Netherlands, June 2011.
2. Yip, N.Y., Tiraferri, A., Phillip, W.A., Schiffman, J.D., and Elimelech, M. "Thin-film Composite Membrane For Osmotically-Driven Membrane Processes", *Gordon Research Seminar – Membranes: Materials and Processes 2010*, New London, NH, July 2010.
1. Yip, N.Y., Tiraferri, A., Phillip, W.A., Schiffman, J.D., and Elimelech, M. "Thin-film Composite Membrane For Osmotically-Driven Membrane Processes", *ACS National Meeting 2010*, San Francisco, CA, March 2010.

PATENTS

1. Yip, N.Y., Phillip, W.A., Schiffman, J.D., and Elimelech, M., "High Flux Thin-Film Composite Forward Osmosis and Pressure Retarded Osmosis Membranes", US Patent 20120318729 A1.

TEACHING

EAAE E2100, A Better Planet by Design (co-instruction)

EAAE E9280, Earth & Environmental Colloquium

PROFESSIONAL ACTIVITIES

Reviewer for Scholarly Journals

- *Environmental Science and Technology* (ACS)
- *ES&T Letters* (ACS)
- *Water Research* (IWA Publishing)
- *Energy & Environmental Science* (RSC)
- *ACS Sustainable Chemistry & Engineering* (ACS)
- *Journal of Membrane Science* (Elsevier)
- *ChemSusChem* (Wiley)
- *Applied Energy* (Elsevier)
- *Desalination* (Elsevier)
- *Renewable Energy* (Elsevier)
- *Journal of Environmental Engineering* (ASCE)

Professional Membership

- American Chemical Society (ACS)
- Association of Environmental Engineering and Science Professors (AEESP)