Tu, Yu-Ming（杜育銘）
Assistant Professor

B.S. in Chemical Engineering
National Cheng Kung University, 2013

M.S. in Chemical Engineering
National Taiwan University, 2015

Ph.D. in Chemical Engineering
The University of Texas at Austin, 2021

Research and Professional Interests
2D Polymeric Porous Materials and Thin Films;
Aqueous Ion Channels and Sensing Devices;
Energy-Environment-Water Nexus;
Sustainable Bioinspired Separation Membrane Technologies

Projects (started from 2024)

Journal Papers

1. **Tu, Y.M.**†, Kuehne, M.†, Misra, R.H., Ritt, C.L., Faucher, S., Oliaei, H., Li, H., Xu, X., Yang, J., Penn, A., Cumings, J., Majumdar, A., Aluru, N.R., Blankschtein, D. and Strano, M.S. "Environmental Damping and Vibrational Coupling of Confined Fluids within Isolated Carbon Nanotubes." **Nature Communications** 15, no. 1 (2024): 5605. (8/134, MULTIDISCIPLINARY SCIENCES; IF: **14.7**) (Published Online: 03 July 2024)
2. Oh, H.†, **Tu, Y. M.**†, Samineni, L., De Respino. S., Mehrafrooz, B., Joshi, H., Massenburg, L., Lopez, H., Elessawy, N., Song, W., Behera, H., Boorla, V.S., Lin, Y.C., Maranas, C., Aksimentiev, A., Freeman, B.D. and Kumar, M., "Dehydrated Biomimetic Membranes with Skinlike Structure and Function." **ACS Applied Materials & Interfaces** 16, no. 16 (2024): 20865-20877. (69/438, MATERIALS SCIENCE, MULTIDISCIPLINARY; IF: **8.3**) (Published Online: 10 April 2024, Issue Date: 24 April 2024)
3. Samineni, L., De Respino, S., Depaolis, M., Mohanty, R.P., **Tu, Y.M.**, Velegol, S. and Kumar, M. "Highly effective nanoparticle removal in plant-based water filters." **Environmental Science: Advances** 2, no. 8 (2023): 1130-1138. (Published Online: 10 July 2023)
4. Samineni, L., De Respino, S., **Tu, Y.M.**, Chowdhury, R., Mohanty, R.P., Oh, H., Geitner, M., Alberg, C.H., White., A.H., McKenzie, S., Lemus, C., Massey, J., Ghoshc, D., Velegol, S. and Kumar, M. "Effective pathogen removal in sustainable natural fiber Moringa filters." **npj Clean Water** 5, no. 1 (2022): 1-12. (2/100, WATER RESOURCES; IF: **12.19**) (Published Online: 6 July 2022)
5. Shen, J., Roy, A., Joshi, H., Samineni, L., Ye, R., **Tu, Y.M.**, Song, W., Skiles, M., Kumar, M., Aksimentiev, A., and Zeng, H., "Fluorofoldamer-Based Salt- and Proton-Rejecting Artificial Water Channels for Ultrafast Water Transport." **Nano Letters** 22, no. 12 (2022): 4831-4838. (32/345, MATERIALS SCIENCE, MULTIDISCIPLINARY; IF: **12.26**) (Published Online: 8 June 2022)
6. Koner, S., Tawfik, J., Mashali, F., Kennison, K. B., Heberle, F. A., **Tu, Y.M.**, Kumar, M., Sarles, S. A., "Homogeneous hybrid droplet interface bilayers assembled from binary mixtures of DPhPC phospholipids and PB-b-PEO diblock copolymers." **Biochimica et Biophysica Acta (BBA)-Biomembranes** 1864, no. 10 (2022): 183997. (26/72, BIOPHYSICS; IF: **4.02**) (Published Online: 16 June 2022, Issue Date: October 2022)

7. De Respino. S., Samineni. L., **Tu, Y.M.**, Oh, H. and Kumar, M., "Simultaneous Removal of Oil and Bacteria in a Natural Fiber Filter." **Environmental Science & Technology Letters** 9, no. 1 (2021): 77-83. (20/279, ENVIRONMENTAL SCIENCES; IF: **11.56**) (Published Online: 15 November 2021, Issue Date: January 2022)
8. Roy, A., Shen, J., Joshi, H., Song, W., **Tu, Y.M.**, Ruijuan, Y., Li, N., Ren, C., Kumar, M., Aksimentiev, A. and Zeng, H., "Foldamer-based ultrapermeable and highly selective artificial water channels that exclude protons." **Nature Nanotechnology** 16, no. 8 (2021): 911-917. (3/414, MATERIALS SCIENCE, MULTIDISCIPLINARY; 1/38, NANOSCIENCE & NANOTECHNOLOGY; IF: **40.52**) (Published Online: 20 May 2021, Issue Date: August 2021)
9. **Tu, Y.M.**, Samineni, L., Ren, T., Schantz, A.B., Song, W., Sharma, S. and Kumar, M., "Prospective applications of nanometer-scale pore size biomimetic and bioinspired membranes." **Journal of Membrane Science** 620 (2021): 118968. (7/160, ENGINEERING, CHEMICAL; 3/95, POLYMER SCIENCE; IF: **10.53**) (Published Online: 18 December 2020, Issue Date: 15 February 2021)
10. **Tu, Y.M.**[†], Song, W.[†], Ren, T.[†], Shen, Y.X., Chowdhury, R., Rajapaksha, P., Culp, T.E., Samineni, L., Lang, C., Thokkadam, A., ... and Kumar, M., "Rapid fabrication of precise high-throughput filters from membrane protein nanosheets." **Nature Materials** 19, no. 3 (2020): 347-354. (1/165, CHEMISTRY, PHYSICAL; 4/345, MATERIALS SCIENCE, MULTIDISCIPLINARY; IF: **47.66**) (Published: 27 January 2020, Issue Date: March 2020)
11. Song, W., Joshi, H., Chowdhury, R., Najem, J.S., Shen, Y.X., Lang, C., Henderson, C.B., **Tu, Y.M.**, Farell, M., Pitz, M.E., ... and Kumar, M., "Artificial water channels enable fast and selective water permeation through water-wire networks." **Nature Nanotechnology** 15, no. 1 (2020): 73-79. (3/414, MATERIALS SCIENCE, MULTIDISCIPLINARY; 1/138, NANOSCIENCE & NANOTECHNOLOGY; IF: **40.52**) (Published Online: 16 December 2019, Issue Date: 02 January 2020)
12. Lang, C., Ye, D., Song, W., Yao, C., **Tu, Y.M.**, Capparelli, C., LaNasa, J.A., Hickner, M.A., ... and Kumar, M., "Biomimetic Separation of Transport and Matrix Functions in Lamellar Block Copolymer Channel-Based Membranes." **ACS Nano** 13, no. 7 (2019): 8292-8302. (20/345, MATERIALS SCIENCE, MULTIDISCIPLINARY; IF: **18.03**) (Published Online: 28 June 2019, Issue Date: 23 July 2019)
13. Shih, Y.L., Huang, L.T.[†], **Tu, Y.M.**[†], Lee, B.F., Bau, Y.C., Hong, C.Y., Lee, H.L., ... and Chao, L., "Active Transport of Membrane Components by Self-organization of the Min Proteins." **Biophysical Journal** 116, no. 8 (2019): 1469-1482. (*Featured as the cover page of Volume 116, Issue 8, 2019*) (30/72, BIOPHYSICS; IF: **3.69**) (Published Online: 23 March 2019, Issue Date: 23 April 2019)
14. Song, W., **Tu, Y.M.**, Oh, H., Samineni, L. and Kumar, M., "Hierarchical Optimization of High-Performance Biomimetic and Bioinspired Membranes." **Langmuir** 35, no. 3 (2018): 589-607. (*Featured as ACS Editor's Choice*) (72/179, CHEMISTRY, MULTIDISCIPLINARY; IF: **4.33**) (Published Online: 21 December 2018, Issue Date: 22 January 2019)

Conference

1. **Tu, Y.M.,** Kuehne, M., Misra, R.H., Ritt, C.L., Blankschtein, D., and Strano, M.S.
   Title: Environmental Damping and Vibrational Coupling of Confined Fluids within Isolated Carbon Nanotubes
   NT24, 24th conference of the NT series, Cambridge, MA, USA (***Contributed Plenary Speaker***), June 2024
2. **Tu, Y.M.** and Strano, M.S.
   Title: Fluid Confinement and Transport in 1D and 2D Nanofluidic Systems
   2024 CENT Symposium, Cambridge, MA, USA (*Oral and Poster*), June 2024

3. **Tu, Y.M.**, Misra, R.H., Blankschtein, D., and Strano, M.S.
   Title: Nanofluidic Platforms towards Nanoconfined fluids at the Water-Energy Nexus
   2024 Nanofluidics Conference, Lenzerheide, Switzerland (*Oral*), January 2024
4. **Tu, Y.M.**, Gong, X., and Strano, M.S.
   Title: Morphological TEM Characterization of 2D Polymers and Impermeable Barriers
   2023 Material Research Society (MRS) Fall Meeting, Boston, MA, USA (*Oral*), December 2023
5. **Tu, Y.M.**, Gong, X., and Strano, M.S.
   Title: Morphological Characterization of 2D Polymers and Materials: TEM Imaging Processing and Analysis
   2023 American Institute of Chemical Engineers (AIChE) Annual Meeting, Orlando, FL, USA (*Oral*), November 2023
6. **Tu, Y.M.** and Strano, M.S
   Title: Nanofluidic Platforms for Knowledge Gaps at the Water-Energy Nexus
   2023 CENT Symposium, Maryland, MD, USA (*Oral and Poster*) – **Poster award**
7. **Tu, Y.M.**, Kuehne, M., and Strano, M.S.
   Title: Environmental Damping in Vibrationally Coupled Carbon Nanotubes
   2023 Electrochemical Society (ECS) Spring Meeting, Boston, MA, USA, May 2023
8. Lundberg, D., **Tu, Y.M.**, and Strano, M.S.
   Title: Carbon Fixing Material Systems
   2023 American Chemical Society (ACS) Spring Meeting, Indianapolis, IN, USA, March 2023
9. **Tu, Y.M.**, Oh, H., Freeman, B.D., and Kumar, M.
   Title: Biomimetic Membranes from Membrane Protein-Block Copolymer for Aqueous and Vapor Applications
   2022 Material Research Society Spring Meeting: – **Oral award**, May 2022
10. **Tu, Y.M.**, Oh, H., Freeman, B.D., and Kumar, M.
    Title: Membrane Protein-Based Biomimetic Membranes for Water Treatment
    2021 American Institute of Chemical Engineers (AIChE) Annual Meeting, Boston, MA, USA (*Oral*), November, 2021
11. Oh, H.†, **Tu, Y.M.**†, Freeman, B.D., and Kumar, M.
    Title: Beta-Barrel Membrane Protein-Based Biomimetic Nanoporous Membrane for Protective Fabrics
    2021 American Institute of Chemical Engineers (AIChE) Annual Meeting, Boston, MA, USA (*Poster*), November 2021
12. **Tu, Y.M.**, Oh, H., Freeman, B.D., and Kumar, M.
    Title: Biomimetic Membranes from Membrane Protein-Block Copolymer Nanosheets for Precise Molecular Separations
    30th North American Membrane Society (NAMS) Annual Meeting, Estes Park, CO, USA (*Oral* and *Poster*), August 2021
13. Oh, H.†, **Tu, Y.M.**†, Freeman, B.D., and Kumar, M.
    Title: Membrane protein-based nanoporous membranes that transport vapor at high rates while impermeable to water
    30th North American Membrane Society (NAMS) Annual Meeting, Estes Park, CO, USA (*Oral* and *Poster*), August 2021
14. **Tu, Y.M.**, Oh, H., Freeman, B.D., and Kumar, M.
    Title: Membrane Protein Channel-Inserted Biomimetic Membranes
    2020 American Institute of Chemical Engineers (AIChE) Virtual Annual Meeting (Oral), November 2020
15. **Tu, Y.M.**, Oh, H., Freeman, B.D., and Kumar, M.
    Title: High-Density Membrane Protein-Polymer Nanosheets Biomimetic Membranes
    29th North American Membrane Society (NAMS) Virtual Annual Meeting (*Oral* and *Poster*) – **Poster award**, May 2020
16. **Tu, Y.M.**, Song, W., Ren, T., and Kumar, M.
    Title: Membrane Protein Nanosheet-Based Membranes

2019 American Institute of Chemical Engineers (AIChE) Annual Meeting, Orlando, FL, USA (*Oral*) , November 2019

17. **Tu, Y.M.**, Song, W., Ren, T., Hickey, R.J., and Kumar, M.
    Title: Self-assembled Block Copolymer: Membrane Protein Nanosheets as High-performance Membrane Materials
    2019 American Chemical Society (ACS) Fall National Meeting, San Diego, CA, USA (*Oral*), August 2019
18. **Tu, Y.M.**, Song, W., Ren, T., and Kumar, M.
    Title: Scalable High-Performance Membranes with High-Density Channel Protein-Polymer Nanosheets
    28th North American Membrane Society (NAMS) Annual Meeting, Pittsburgh, PA, USA (*Oral*), May 2019
19. **Tu, Y.M.**, Lee, H.L., Shih, Y.L. and Chao, L.
    Title: Study of Min Protein-Induced Membrane Waves *in vitro*
    59th Biophysical Society Annual Meeting, Baltimore, Maryland, USA (*Poster*), February 2015
20. **Tu, Y.M.**, Lee, H.L., Shih, Y.L., and Chao, L.
    Title: Study of Min Protein-Induced Membrane Waves *in vitro*
    Taiwan Institute of Chemical Engineers Annual Meeting, Taoyuan, Taiwan (*Oral*) – **Oral award,** December 2014
21. **Tu, Y.M.**, Lee, H.L., Shih, Y.L., and Chao, L.
    Title: Study of Min Protein-Induced Membrane Waves *in vitro*
    International Symposium on Chemical-Environmental-Biomedical Technology, Taoyuan, Taiwan (*Oral*) – **Oral award**, September 2014
22. **Tu, Y.M.**, Lee, H.L., Shih, Y.L., and Chao, L.
    Title: Study of Min Protein-Induced Membrane Waves *in vitro*
    3rd International Symposium of Materials on Regenerative Medicine, Taoyuan, Taiwan (*Oral*) – **Oral award,** August 2014

Honors and Others

1. ***2nd Place* in 2023 CENT Symposium Poster Competition**, August 2023
   Title: Environmental Damping in Vibrationally Coupled Carbon Nanotubes
2. ***1st Place* in 2023 CENT Lightning Talk, the Representative to Attend DOE Annual Meeting**, July 2023
   Title: Nanofluidic Platforms for Knowledge Gaps at the Water-Energy Nexus
3. ***Silver Winner* in 2022 MRS Spring Meeting Graduate Student Award**, May 2022
   Title: Biomimetic Membranes from Membrane Protein-Block Copolymer 2D Materials for Aqueous and Vapor Applications
   2022 Material Research Society (MRS) Spring Meeting & Exhibit, Honolulu, Hawaii
4. **2021 AIChE Separations Division Graduate Student Research Award of the Membrane Area**, November 2021
   Title: Membrane Protein-Based Biomimetic Membranes for Precise Molecular Separations
   2021 American Institute of Chemical Engineers (AIChE) Annual Meeting, Boston, MA, USA
5. **2021 AIChE 8A Excellence in Polymer Graduate Research Symposium Finalist**, November 2021
   Title: Rapid Self-assembly: Biomimetic Membranes from Membrane Protein-Block Copolymer Nanosheets
   2021 American Institute of Chemical Engineers (AIChE) Annual Meeting, Boston, MA, USA
6. **2021 North American Membrane Society (NAMS) Student Fellowship Award**, August 2021

Title: Biomimetic Membranes from Membrane Protein-Block Copolymer Nanosheets for Precise Molecular Separations
30th North American Membrane Society (NAMS) Annual Meeting, Estes Park, CO, USA

7. **Fall '21 Professional Development Award**, Fall 2021
   Department of Chemical Engineering, Graduate School, The University of Texas at Austin
8. **George J. Heuer, Jr. Ph.D. Endowed Graduate Fellowship**, Fall 2021
   UT Engineering Scholarship Award, The University of Texas at Austin
9. **Honorable Mention in "1-Min Quick Pitch" MRSEC Competition**, April 2021
   Title: Creation of Soft Tissues Using Droplet Interfacial Bilayer (DIB)
   The Center for Dynamics and Control of Materials: an NSF Materials Research Science and Engineering Centers (MRSEC) Annual Meeting
10. **Graduate and Industry Networking (GAIN) 2021 Department Award**, March 2021
    Title: Membrane Protein-Based Nanoporous Membranes for Water Treatment and Vapor Transport
11. **2nd Prize in NAMS Poster Competition**, May 2020
    29th North American Membrane Society (NAMS) Virtual Annual Meeting
12. **Elias Klein Founders' Travel Supplement Program**, May 2019
    North American Membrane Society (NAMS) Pittsburgh, PA, USA
13. **Pennsylvania State University Graduate Student Fellowship**, Fall 2017 - Spring 2018
    Additional $5,000 stipend to selected students in Department of Chemical Engineering, Pennsylvania State University
14. **Honorable Mention in English Oral Presentation Award**, December 2014
    Taiwan Institute of Chemical Engineers Annual Meeting, Taoyuan, Taiwan
15. **Best in English Oral Presentation Award**, September 2014
    International Symposium on Chemical- Environmental-Biomedical Technology, Taoyuan, Taiwan
16. **Honorable Mention in English Oral Presentation Award,** August 2014
    International Symposium of Materials on Regenerative Medicine, Taoyuan, Taiwan
17. **Formosan Union Chemical Corp. Scholarship for Outstanding Student**, 2013
    One of the top scholarships in Taiwan from the chemical engineering industry, and only one is awarded in the department of chemical engineering, National Cheng Kung University (NCKU)
18. **Outstanding Student Award for Academic Achievement**
    Top 5 % of students in NCKU for 3 times, 2009-2010, 2010-2011, 2011-2012 School year
19. **NCKU Chemical Engineering Alumni Foundation Scholarship for Outstanding Student**, 2012
    To the student with the best academic performance in each class