Jaewan Mun

Postdoctoral researcher, UC Berkeley
(650) 575-0534 • jmun@berkeley.edu

Last updated on 3/1/2021

EDUCATION

Stanford University — Stanford, CA
Ph.D, Chemical Engineering — Jan 2021
Dissertation: Molecular design principles of deformable polymer semiconductors for soft electronics

Stanford University — Stanford, CA
M.S, Chemical Engineering; GPA: 4.00/4.00 — Jan 2018

Seoul National University — Seoul, Republic of Korea
B.S, *Summa cum laude*, Chemical & Biological Engineering; GPA: 3.97/4.00 — Mar 2015

HONORS AND AWARDS

Stanford Bio-X Travel Award	2019
Samsung Scholarship	2015-2020
Stanford Departmental Fellowship	2015-2016
Seoul National University Engineering Top Graduate Award	2015
National Presidential Science Scholarship	2009-2015

RESEARCH EXPERIENCE

Department of Chemical and Biomolecular Engineering, UC Berkeley — Berkeley, CA
Postdoctoral Researcher; Advisor: Prof. Markita Landry — 2021-Present
Fabrication and characterization of nano-sensors and their applications in brain imaging

- Fabricated and characterized CNT-based nano-sensors.
- Developed molecularly engineered polymers for the passivation of the nano-sensors.
- Applied the nano-sensors for imaging neurotransmitters in brains.

Department of Chemical Engineering, Stanford University — Stanford, CA
Graduate Researcher; Advisor: Prof. Zhenan Bao — 2016-2020
Molecular design principles of deformable polymer semiconductors for soft electronics

- Developed deformable polymer semiconductors through chemical structure modification and molecular additive strategies.
- Analyzed the mechanical, electrical, optical and thermal properties of polymer semiconductor thin films.
- Characterized the microstructures of polymer semiconductor thin films via spectroscopic methods and synchrotron X-ray diffraction.
- Fabricated stretchable transistors and analyzed the change of mobility under strain.

Department of Chemical Engineering, Stanford University Stanford, CA

Graduate Researcher; Advisor: Prof. Curtis W. Frank 2015

Block copolymer membranes for fuel cells

- Developed polyimide and poly(ethylene glycol) block copolymer films doped with ionic liquid for fuel cells.
- Analyzed the electrical and thermal properties of such block copolymer films.

Department of Chemical & Biological Engineering, Seoul National University Seoul, Republic of Korea

Undergraduate Researcher; Advisor: Prof. Kookheon Char 2014-2015

Phase behavior of block copolymers under 2D nanoconfinement

- Analyzed the phase transition of poly(styrene-b-butadiene) (PS-b-PBD) and PS binary blends in cylindrical confinements.

TEACHING EXPERIENCE

Stanford University Stanford, CA

Teaching Assistant, Solid Structure and Properties of Polymers Winter 2019

Teaching Assistant, Micro- and Nano-Fabrication Engineering Winter 2018

Seoul National University Seoul, Republic of Korea

Teaching Assistant, Basic Chemistry Fall 2010, Spring 2011

Teaching Assistant, Basic Calculus Fall 2010

PEER-REVIEWED PUBLICATIONS

1. **J. Mun**, Y. Ochiai, S. Schneider, Y. Zheng, J. B. –H. Tok, Z. Bao. Fatigue of Stretchable Polymer Semiconductors, *In preparation*.
2. Y. Zheng, Z. Yu, S. Zhang, X. Kong, W. Michaels, W. Wang, G. Chen, D. Liu, J.-C. Lai, N. Prine, W. Zhang, S. Nikzad, C. B. Cooper, D. Zhong, **J. Mun**, J. Kang, J. B. –H. Tok, I. McCulloch, J. Qin, X. Gu, Z. Bao. A molecular design approach towards elastic and photo-patternable polymer electronics., *Submitted*.
3. D. Liu[†], **J. Mun**[†], G. Chen, Y. Zheng, W. Wang, N. J. Schuster, J.-C. Lai, S. Nikzad, Y. Wu, Z. Bao. A design strategy for intrinsically stretchable high-performance polymer semiconductors, *Submitted*. ([†]Co-first Authors)
4. **J. Mun**[†], Y. Ochiai[†], Y. Zheng, Y. Zheng, H.-C. Wu, N. Matsuhisa, T. Higashihara, J. B. –H. Tok, Z. Bao. A design strategy for high mobility stretchable polymer semiconductors, *Under revision*. ([†]Co-first Authors)
5. I. You, D. G. Mackanic, N. Matsuhisa, J. Kang, J. Kwon, L. Beker, **J. Mun**, W. Suh, T. Y. Kim, J. B.-H. Tok, Z. Bao. Artificial Multimodal Receptors Based on Ion Relaxation Dynamics, *Science*, 370(6519), 961 (2020).
6. Y. Zheng, M. Ashizawa, S. Zhang, J. Kang, S. Nikzad, Z. Yu, Y. Ochiai, H.-C. Wu, H. Tran, **J. Mun**, Y.-Q. Zheng, J. B. –H. Tok, X. Gu, Z. Bao. Tuning mechanical properties of polymer semiconductor by modulating hydrogen bonding interactions., *Chem. Mater.*, 32(13), 5700 (2020).
7. **J. Mun**, J. Kang, Y. Zheng, S. Luo, Y. Wu, H. Gong, J.-C. Lai, H.-C. Wu, G. Xu, J. B. –H. Tok, Z. Bao. F4-TCNQ as an Additive to Impart Stretchable Semiconductors with High Mobility and Stability., *Adv. Electron, Mater.*, 6(6), 2000251 (2020).
8. J. -Y. Oh, D. Son, T. Katsumata, Y. Lee, Y. Kim, J. Lopez, H. -C. Wu, J. Kang, J. Park, X. Gu, **J. Mun**, G. -J. N. Wang, Y. Yin, W. Cai, Y. Yun, J. B. -H. Tok, Z. Bao, Stretchable Self-healable Semiconducting Polymer Film for Active-matrix Strain Sensing Array., *Sci. Adv.*, 5(11), eaav3097 (2019)

9. J. C. Yang[†], **J. Mun**[†], S. Y. Kwon, S. Park, Z. Bao, S. Park. Recent Progress and Future Prospects of Electronic Skin for Wearable Electronics, Robotics, and Prosthetic Applications., *Adv. Mater.*, 31(48), 1904765 (2019). ([†]Co-first Authors, Inside Front Cover)
10. Y. Zheng, G. -J. N. Wang, J. Kang, M. Nikolka, H. -C. Wu, H. Tran, S. Zhang, H. Yan, H. Chen, P. Y. Yuen, **J. Mun**, R. H. Dauskardt, I. McCulloch, J. B. -H. Tok, X. Gu, Z. Bao, An Intrinsically Stretchable High-performance Polymer Semiconductor with Low-crystallinity., *Adv. Funct. Mater.*, 29(46), 1905340 (2019)
11. **J. Mun**, J. Kang, Y. Zheng, S. Luo, H. –C. Wu, N. Matsuhisa, J. Xu, G. –J. N. Wang, Y. Yun, G. Xu, J. B. –H. Tok, Z. Bao. Conjugated Carbon Cyclic Nanoring as Additives for Intrinsically Stretchable Semiconducting Polymers., *Adv. Mater.*, 31(42), 1903912 (2019)
12. S. H. Kim, H. Seo, J. Kang, J. Hong, D. Seong, H.-J. Kim, J. Kim, **J. Mun**, I. Youn, J. Kim, Y.-C. Kim, H.-K. Seok, C. Lee, J. B.-H. Tok, Z. Bao, D. Son. An Ultra-stretchable and Self-healable Nanocomposite Conductor Enabled by Autonomously Percolative Electrical Pathways., *ACS Nano*, 13(6), 6531-6539 (2019)
13. E. Woo, E. Coletta, A. Holm, **J. Mun**, M. F. Toney, D. Y. Yoon, C. W. Frank. Polyimide-PEG Segmented Block Copolymer Membranes with High Proton Conductivity by Improving Bicontinuous Nanostructure of Ionic-liquid Doped Films., *Macromol. Chem. Phys.*, 220 (9), 1900006 (2019)
14. J. Kang, D. Son, O. Vardoulis, **J. Mun**, N. Matsuhisa, Y. Kim, J. Kim, J. B. –H. Tok, Z. Bao. Modular and Reconfigurable Stretchable Electronic Systems., *Adv. Mater. Technol.*, 4(3), 1800417 (2018)
15. D. Son, J. Kang, O. Vardoulis, Y. Kim, J. Y. Oh, J. W. F. To, **J. Mun**, T. Katsumata, M. Krason, F. M.-Lopez, J. Ham, U. Kraft, Y. Lee, Y. Yun, J. B. –H. Tok, Z. Bao. An Integrated Self-healable Skin System Fabricated via Dynamic Reconstruction of Nanostructured Conducting Network., *Nat. Nanotech.*, 11(13), 1057-1065 (2018)
16. **J. Mun**, G. –J. N. Wang, J. Y. Oh, F. L. Lee, T. Katsumata, J. Kang, H. –C. Wu, F. Lissel, S. R. –Gagné, J. B. –H. Tok, Z. Bao. Effect of Non-Conjugated Spacers on Mechanical Properties of Semiconducting Polymers for Stretchable Transistors., *Adv. Funct. Mater.*, 28(43), 1804222 (2018)
17. G. –J. N. Wang, F. M. -Lopez, H. Zhang, J. Xu, H. –C. Wu, J. Lopez, L. Shaw, **J. Mun**, Q. Zhang, S. Wang, A. Ehrlich, Z. Bao. Nonhalogenated Solvent Processable and Printable High-Performance Polymer Semiconductor Enabled by Isomeric Nonconjugated Flexible Linkers., *Macromolecules*, 51(13), 4976-4985 (2018)
18. J. Kang, D. Son, G. –J. N. Wang, Y. Liu, J. Lopez, Y. Kim, J. Y. Oh, T. Katsumata, **J. Mun**, Y. Lee, L. Jin, J. B. –H. Tok, Z. Bao. Tough and Water-Insensitive Self-Healing Elastomer for Robust Electronic Skin. *Adv. Mater.*, 30(13), 1706846 (2018).
19. B. C. Schroeder, T. Kurosawa, T. Fu, Y. –C. Chiu, **J. Mun**, G.-N. Wang, X. Gu, L. Shaw, J. W. E. Kneller, T. Kreouzis, M. F. Toney, Z. Bao. Taming Charge Transport in Semiconducting Polymers with Branched Alkyl Side Chains. *Adv. Funct. Mater.*, 27(34), 1701973 (2017).
20. Y. Kim, **J. Mun**, G. Yu, K. Char. Phase Transition of Block Copolymer/Homopolymer Binary Blends under 2D Confinement. *Macromol. Res.*, 25(6), 656-661 (2017).

CONFERENCE PRESENTATIONS

1. **J. Mun**, Y. Ochiai, Z. Bao. Stretchable and Fully Conjugated Donor-Acceptor Terpolymers with High Performance and Elasticity. Oral Presentation, Virtual Materials Research Society (MRS) Spring/Fall Meeting & Exhibit, 2020 December.
2. **J. Mun**, Z. Bao. Conjugated Carbon Cyclic Nanoring as Additives for Intrinsically Stretchable Semiconducting Polymers. Oral Presentation, Materials Research Society (MRS) Fall Meeting & Exhibit, 2019 December.
3. **J. Mun**, Z. Bao. Effect of Flexible Conjugation-break Spacers for Intrinsically Stretchable Polymer Semiconductors. Oral Presentation, Materials Research Society (MRS) Spring Meeting & Exhibit, 2019 April.
4. **J. Mun**, Z. Bao. High free-volume additives for stretchable polymer semiconductors. Poster Presentation, eWear Stanford Wearable Electronics Initiative Annual Meeting, 2019 February.
5. **J. Mun**, Z. Bao. Effect of Nonconjugated Spacers on Mechanical Properties of Semiconducting Polymers for Stretchable Transistors. Poster Presentation, International Symposium on Stimuli-Responsive Materials (ISSRM), 2018 October.

6. **J. Mun**, Z. Bao. Effect of Non-Conjugated Spacers on Intrinsically Stretchable Semiconducting Polymers. Poster Presentation, 43rd Annual Mason Lectures, 2018 May.
7. **J. Mun**, J. Y. Oh, Z. Bao. Intrinsically Stretchable Polymer Semiconductors using Molecularly Engineered Conjugation Breakers. Oral Presentation, International Conference on Flexible and Printed Electronics (ICFPE), 2017 September.

REFERENCES

1. Prof. Zhenan Bao
   K.K. Lee professor of Chemical Engineering at Stanford Univ.
   Ph.D advisor
   zbao@stanford.edu

2. Prof. Markita Landry
   Assistant professor of Chemical and Biomolecular Engineering at UC Berkeley
   Postdoc advisor
   landry@berkeley.edu

3. Prof. Steve Park
   Assistant professor of Materials Science and Engineering at KAIST
   Collaborator PI
   stevepark@kaist.ac.kr