# Curriculum Vitae - Buz Barstow

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Department of Biological and Environmental Engineering
Cornell University
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Faculty Position Appointment Dates: January 2nd 2018 to present

## A. Education and Training

| INSTITUTION AND LOCATION | DEGREE *(if applicable)* | YEAR(s) | FIELD OF STUDY |
|---|---|---|---|
| Imperial College, London, United Kingdom | MSci, 1st Class | 1997-2001 | Physics |
| Cornell University | Ph.D. | 2001-2009 | Applied Physics |
| Harvard Medical School | Postdoc | 2009-2014 | Synthetic Biology |

## B. Positions and Honors

| ACTIVITY/ OCCUPATION | BEGINNING DATE | ENDING DATE | FIELD | INSTITUTION/COMPANY | SUPERVISOR/ EMPLOYER |
|---|---|---|---|---|---|
| Undergraduate Researcher | 07/2000 | 09/2000 | Quantum Optics | Quantum Optics and Laser Science Group, Imperial College, London, UK | Dr. Jon Marangos |
| Undergraduate Researcher | 10/2000 | 07/2001 | Quantum Optics and Plasma Physics | Quantum Optics and Laser Science Group, Imperial College, London, UK | Dr. Roland Smith |
| Undergraduate Researcher and Technician | 04/2001 | 08/2001 | Biotechnology Instrumentation Development | DeltaDOT Ltd, Imperial College London, UK | Dr. John Hassard |
| Teaching Assistant | 08/2001 | 05/2002 | Mathematical Physics | Applied and Engineering Physics, Cornell University | Prof. Bruce Kusse |
| Graduate Research Assistant | 05/2002 | 08/2003 | Particle Accelerator Development | Laboratory for Elementary-Particle Physics, Cornell University | Prof. Hasan Padamsee and Prof. Sol M. Gruner |
| Graduate Research Assistant | 08/2003 | 04/2009 | Biophysics | Laboratory of Atomic and Solid State Physics, Cornell University | Prof. Sol M. Gruner |
| Postdoctoral Research Fellow | 04/2009 | 06/2014 | Synthetic Biology | Harvard Medical School | Prof. Pamela A. Silver |
| Research Associate | 07/2014 | 12/2017 | Synthetic Biology | Princeton University | |
| Assistant Professor | 01/2018 | 10/2024 | Synthetic Biology | Cornell University | |

| ACTIVITY/ OCCUPATION | BEGINNING DATE | ENDING DATE | FIELD | INSTITUTION/COMPANY | SUPERVISOR/ EMPLOYER |
|---|---|---|---|---|---|
| Associate Professor | 11/2024 | Present | Synthetic Biology | Cornell University | |

## C. Academic and Professional Honors

- Cornell Engineering Research Excellence Award, 2024.
- Mr. & Mrs. Richard F. Tucker '50 Excellence in Teaching Award, 2024.
- Cornell Atkinson Center for Sustainability Senior Faculty Fellow, 2024-present.
- Carl Sagan Institute Faculty Fellow, 2021-present.
- Cornell Atkinson Center for Sustainability Faculty Fellow, 2019-2023.
- Burroughs-Wellcome Fund Career Award at the Scientific Interface, *"Evolving the limits of metabolism and in vivo catalysis"*, 2012-present.
- Finalist for the Gregorio Weber International Prize in Biological Fluorescence, 2011.
- NIH Ruth L. Kirschstein National Research Service Award (F32GM089028), *"Evolution of biological hydrogen production"*, 2010-2013.
- William Nichols Findley Exceptional Research Award, Cornell University, 2009.
- Travel grant for "Fourth Generation Light Sources I: X-Ray Laser", US Particle Accelerator School hosted by Indiana University, Baton Rouge, LA, January 6-17, 2003.

## D. Publications

An up to date list of publications can be found at barstow.bee.cornell.edu/publications. My ORCID is 0000-0003-2218-6152.

### Journal Articles

52. J.L. Adair, M. Pecchi, B. Barstow, J.L. Goldfarb, "Utilizing the residual carbon in hydrothermal processing aqueous phase to cultivate *Gluconobacter oxydans*", *In Review at ACS Sustainable Chemistry & Engineering* (2024).
49. Y. Park, T. Yan, Z. Zhao, B. Fu, M. Yang, F. Salimijazi, B. Barstow, P. Chen, "Membrane-protein condensate formation controls bacterial extracellular electron transfer", *In Review at Nature Chemistry* (2024).
44. L. Plante, J.D. Klug, J.J. Lee, A. Hornby, J. Adair, S. Marecos, M.C. Reid, E. Gazel, B. Barstow, "Cross-species Comparison of Ultramafic Rock Bio-accelerated Weathering Performance". *In Submission* (2024). doi:10.1101/2024.11.19.624384.
42. J.B. Balta, M.E. Holycross, B. Barstow, E. Gazel, "Co-generation of $NaREE(MoO_4)_2$ and $REEPO_4$ in multiple habits by solid-flux crystal growth", *In Submission at International Journal of Minerals, Metallurgy and Materials* (2024).
41. M.G Alaman-Zarate, B.J. Rady, C.A. Evans, B. Pian, D. Greetham, S. Marecos, M.J. Dickman, A.L. Lovering, B. Barstow, S. Mesnage, "Unusual 1-3 peptidoglycan cross-links in Acetobacteriaceae are made by L,D-transpeptidases with a catalytic domain distantly related to YkuD domains", *Journal of Biological Chemistry* (2023). doi:10.1016/j.jbc.2023.105494.
38. M. Suri, F. Salimijazi, J.C. Crowley, B. Fu, P. Chen, W.R. Zipfel, B. Barstow, T. Hanrath, "Spatially resolved charge transfer kinetics at the quantum dot-microbe interface using fluorescence lifetime imaging microscopy", *In Review at PNAS* (2024).
37. J. J. Lee, L. Plante, B. Pian, S. Marecos, S. Medin, J.D. Klug, M.C. Reid, G. Gadikota, E. Gazel, B. Barstow, "Bio-Accelerated Weathering of Ultramafic Minerals with Gluconobacter oxydans", *In Submission* (2024). doi:10.1101/2024.11.25.625253.

36. S. Marecos, B. Pian, S. Medin, A.M. Schmitz, M.Wu, J.B. Balta, E. Gazel, M. Holycross, M.C. Reid, B. Barstow, "Direct Genome-Scale Screening of *Gluconobacter oxydans* B58 for Rare Earth Element Bioleaching", *In Review at Communications Biology* (2024). doi:10.1101/2024.06.10.598312.
32. C. Anderson, S. Medin, J. Adair, B. Demopoulos, L. Elmelech, E. Eneli, C. Kuelbs, J. Lee, T.J. Sheppard, D. Şinar, Z. Thurston, M. Xu, K. Zhang, B. Barstow, "Constraints on Lanthanide Separation by Selective Biosorption", *In Review at iScience* (2023). doi:10.1101/2023.10.18.562985.
31. S. Medin, A. Dressel, D.A. Specht, T.J. Sheppard, M.E. Holycross, M.C. Reid, E. Gazel, M. Wu, B. Barstow, "Multiple Rounds of *in vivo* Random Mutagenesis and Selection in *Vibrio natriegens* Result in Substantial Increases in REE Binding Capacity", *ACS Synthetic Biology* (2023). doi:10.1021/acssynbio.3c00484.
30. D.A. Specht, T.J. Sheppard, F. Kennedy, S. Li, G. Gadikota, B. Barstow, "Efficient Natural Plasmid Transformation of *Vibrio natriegens* Enables Zero-capital Molecular Biology", *PNAS Nexus* (2023). doi:10.1093/pnasnexus/pgad444.
29. Z.A. Pollard, M. Karod, A.M. Schmitz, B. Pian, B. Barstow, J.L. Goldfarb, "Stable and Reusable ZnO Precursor Enhances Reactive Oxygen Species to Remove Emerging Pollutants from Water", *Chemical Engineering Journal* (2023). doi:10.1016/j.cej.2023.147499.
28. B. Fu, X. Mao, Y. Park, Z. Zhao, T. Yan, W. Jung, D.H. Francis, W. Li, B. Pian, F. Salimijazi, M. Suri, T. Hanrath, B. Barstow, P. Chen, "Single-cell multimodal imaging uncovers energy conversion pathways in biohybrids", *Nature Chemistry* (2023). doi:10.1038/s41557-023-01285-z.
27. T.J. Sheppard, D.A. Specht, B. Barstow, "Efficiency Estimates for Electromicrobial Production of Branched Chain Hydrocarbons", *iScience* (2024). doi:10.1016/j.isci.2023.108773.
26. A.M. Schmitz, B.D. Pian, S. Marecos, M. Wu, M.E. Holycross, E. Gazel, M.C. Reid, B. Barstow, "High Efficiency Rare Earth Element Biomining with Systems Biology Guided Engineering of *Gluconobacter oxydans*", *In Review at Communications Biology* (2023). doi:10.1101/2023.02.09.527855.
25. S. Medin, A.M. Schmitz, B.D. Pian, M.C. Reid, M.E. Holycross, E. Gazel, M. Wu, B. Barstow, "Genomic Characterization of Rare Earth Binding by *Shewanella oneidensis*", *Scientific Reports* (2023). doi:10.1101/2022.10.31.514631.
24. T.J. Sheppard, D.A. Specht, B. Barstow, "Upper Limit Efficiency Estimates for Electromicrobial Production of Drop-In Jet Fuels". *Bioelectrochemistry* (2023). doi:10.1016/j.bioelechem.2023.108506.
23. S. Marecos, A. Dressel, L. Gaul, L. Li, K. Satish, I. Tjokorda, J. Zheng, B. Barstow, "Practical and Thermodynamic Constraints on Electromicrobially-Accelerated $CO_2$ Mineralization". *iScience* (2022). doi:10.1016/j.isci.2022.104769.
22. L. Wise, K. Randolph, S. Marecos, E. Nshimyumukiza, M. Hassan, J. Strouse, B. Barstow, "Constraints on the Efficiency of Electromicrobial Protein Production". *Frontiers in Bioengineering and Biotechnology* (2022). doi:10.3389/fbioe.2022.820384.
21. A.M. Schmitz, B. Pian, S. Medin, M. Reid, M. Wu, E. Gazel and B. Barstow, "Generation of a *Gluconobacter oxydans* knockout collection for improved extraction of rare earth elements", *Nature Communications* (2021). doi:10.1038/s41467-021-27047-4.
20. A. Rowe, F. Salimijazi, L. Trutschel, J. Sackett, O. Adesina, I. Anzai, L. Kugelmass, M. Baym, B. Barstow, "Identification of a Pathway for Electron Uptake in *Shewanella oneidensis*", *Communications Biology* (2021). doi:10.1038/s42003-021-02454-x.
19. F. Salimijazi, J. Kim, A.M. Schmitz, R. Grenville, A. Bocarsly, B. Barstow, "Constraints on the Efficiency of Electromicrobial Production", *Joule* 4:1-30 (2020). 10.1016/j.joule.2020.08.010.

    Perspective: G. Fan and A.L. Furst, "How Far Can Electromicrobial Production Go?" *Joule* 4:2079–2081 (2020). doi:10.1016/j.joule.2020.09.012.
18. F. Salimijazi, E.A. Parra, B. Barstow, "Electrical Energy Storage with Engineered Biological Systems", *Journal of Biological Engineering* 13:38 (2019). doi:10.1186/s13036-019-0162-7.

17. I.A. Anzai, L. Shaket, O. Adesina, M. Baym, B. Barstow, "Knockout Sudoku, a method for rapidly curating gene disruption collections", *Nature Protocols* 12, 2110–2137 (2017). doi:10.1038/nprot.2017.073.
16. O. Adesina, I.A. Anzai, J.L. Avalos, B. Barstow, "Embracing Biological Solutions to the Sustainable Energy Challenge", *Chem* 2:20–51 (2017). doi:10.1016/j.chempr.2016.12.009.
15. M. Baym, L. Shaket, I.A. Anzai, O. Adesina, B. Barstow, "Rapid Construction of a Whole-genome Transposon Insertion Collection for Shewanella oneidensis by Knockout Sudoku", *Nature Communications* 7, 13270 (2016). doi:10.1038/ncomms13270.
14. B. Barstow, "Molecular Mechanisms for the Biological Storage of Renewable Energy", *Advanced Science, Engineering and Medicine* 7(12):1066-1081, 2015. doi:10.1166/asem.2015.1813.
13. N. Ando* and B. Barstow*, "High hydrostatic pressure effects on proteins: Fluorescence studies", *Encyclopedia of Analytical Chemistry*, eds R.A. Meyers, John Wiley, Chichester (2011). doi:10.1002/9780470027318.a9246.

    *equal attribution, invited review
12. B. Barstow, C.M. Agapakis, P.M. Boyle, G. Grandl, P.A. Silver and E.H. Wintermute, "A Synthetic System Links FeFe-hydrogenases to Essential *E. coli* Sulfur Metabolism", *Journal of Biological Engineering*, 5(1), 7 (2011). doi:10.1186/1754-1611-5-7.
11. B. Barstow, N. Ando, C.U. Kim and S.M. Gruner, "Coupling of Pressure-Induced Structural Shifts to Spectral Changes in a Yellow Fluorescent Protein", *Biophysical Journal* 97:1719-27 (2009). doi:10.1016/j.bpj.2009.06.039.
10. C.U. Kim, B. Barstow, M.W. Tate and S.M. Gruner, "Evidence for Liquid Water During the High-density to Low-density Amorphous Ice Transition", *PNAS* 106:4596-4600 (2009). doi:10.1073/pnas.0812481106.
9 N. Ando, B. Barstow, A. Field, W.A. Baase, B.W. Matthews, and S.M. Gruner, "Structural and Thermodynamic Characterization of T4 Lysozyme Mutants and the Contribution of Internal Cavities to Pressure Denaturation", *Biochemistry* 47:11097-11109 (2008). doi:10.1021/bi801287m.
8. B. Barstow, N. Ando, C.U. Kim and S.M. Gruner, "Alteration of Citrine Structure by Hydrostatic Pressure Explains the Accompanying Spectral Shift", *PNAS* 105:13362-13366 (2008). doi:10.1073/pnas.0802252105.

    Awarded 2009 William Nichols Findley Exceptional Research Award, Cornell University.
7. H. Padamsee, B. Barstow, I. Bazarov, S. Belomestnykh, M. Liepe, V. Medjidzade, R.L. Geng, V. Shemelin, C. Sinclair, K. Smolenski, M. Tigner and V. Vescherevich, "An Overview of the Cryomodule for the Cornell ERL Injector", Proceedings of the European Particle Accelerator Conference, July 5-9, 2004, p. 491. http://buzbarstow.org/resources/Padamsee2004.PDF.
6. B. Barstow, M. Liepe and H. Padamsee, "Engineering a Light Source for the Future", Proceedings of the 11th International Workshop on Superconducting Radio Frequency (SRF 2003), September 8-12, 2003. http://buzbarstow.org/resources/Barstow2003.pdf.
5. H. Padamsee, B. Barstow, I. Bazarov, S. Belomestnykh, M. Liepe, R.L. Geng, V. Shemelin, C. Sinclair, K. Smolenski, M. Tigner and V. Veserevich, "Overview of the Cornell ERL Injector Cryomodule", Proceedings of the 11th International Workshop on Superconducting Radio Frequency (SRF 2003), September 8-12, 2003. http://buzbarstow.org/resources/Padamsee2003.pdf.
4. H. Padamsee, B. Barstow, et al., "An Overview of SRF Activities at Cornell's Laboratory of Elementary Particle Physics", Proceedings of the 11th International Workshop on Superconducting Radio Frequency (SRF 2003), September 8-12, 2003.
3. M. Liepe, B. Barstow and H. Padamsee, "First Studies for a Low Temperature Higher- Order-Absorber for the Cornell ERL Prototype", Proceedings of the 2003 Particle Accelerator Conference, May 12-16,2003. IEEE (2003), Vol. 2, 1320-1322. http://buzbarstow.org/resources/Liepe2003.PDF

2. H. Padamsee, B. Barstow, I. Bazarov, S. Belomestnykh, M. Liepe, R.L. Geng, V. Shemelin, C. Sinclair, K. Smolenski, M. Tigner and V. Veserevich, "Overview of the Cornell ERL Injector Cryomodule", *Proceedings of the 2003 Particle Accelerator Conference*, 2003, pp. 1317-1319 Vol.2, doi:10.1109/PAC.2003.1289691.
1. G.H. Hoffstaetter, B. Barstow, I.V. Bazarov, S. Belomestnykh, D. Bilderback, S.M. Gruner, M. Liepe, H. Padamsee, D. Sagan, V. Shemelin, C. Sinclair, R. Talman, M. Tigner, V. Veshcherevich, G.A. Krafft and L. Merminga, "The Cornell ERL Prototype Project", Proceedings of the 2003 Particle Accelerator Conference, May 12-16, 2003. IEEE (2003), Vol. 1, 192-194. http://buzbarstow.org/resources/Hoffstaetter2003.pdf

### Patents

6. B. Barstow, T.J. Sheppard, D.A. Specht, "Naturally Competent *Vibrio natriegens* Engineered as a Tool for Scalable Synthetic Biology". US provisional application 63/681,621 (2024).
5. B. Barstow, E. Gazel, S. Marecos, S. Medin, B. Pian, A.M. Schmitz, "Non-acid Mediated Mechanisms of Bioleaching by *Gluconobacter oxydans*". US provisional application 63/653,203 (2024).
4. B. Barstow, A. Dressel, S. Medin, M. Wu, "Evolved Strains of *Vibrio natriegens* with Enhanced Total Biosorption and Selectivity for Heavy Rare Earths". US provisional application 63/598,883 (2023).
3. B. Barstow, S. Medin, B. Pian, A.M. Schmitz, "Systems and Methods for Separating Rare Earth Elements with Engineered Microorganisms". US provisional application 63/405,353 (2022).
2. B. Barstow, E. Gazel, S. Medin, B. Pian, A.M. Schmitz, M. Wu, "Systems and Methods for Extracting Rare Earth Elements with Engineered Microorganisms". US provisional application 63/152,798 (2021).
1. B. Barstow, M. Baym, L. Shaket, I.A. Anzai, and O. Adesina, "Method for isolating DNA molecules by generating a progenitor collection catalog". US Patent US11053493B2 (2021)

## E. Invited Talks

- Carl Sagan 90th Birthday Symposium, November 2024.
- Boston University, Bioinformatics Program, Spring 2024.
- Cornell University, Microbiology Department, Spring 2024.
- Air Force Research Lab Discover, Dayton, OH, October 24th 2023 (cancelled due to Federal Government shutdown).
- AgBiome, Research Triangle Park, NC, June 19th 2023.
- University of Edinburgh, School of Physics and Astronomy, May 12th 2023.
- University of Edinburgh, School of Physics and Astronomy, April 6th 2023.
- University of Surrey, Department of Microbial Sciences, April 5th 2023.
- Imperial College, Department of Life Sciences, April 4th, 2023.
- University of Sheffield, Department of Biosciences, April 3rd 2023.
- Cambridge University, Department of Chemistry, March 27th 2023.
- AI-powered Biology Workshop, San Francisco, CA, 2023.
- Hicks Memorial Lecture, Westbury, NY, 2023.
- Cornell CALS Advisory Council, Ithaca, NY, 2023.
- 2030 Project Roundtable, Ithaca, NY, 2022.
- Society for Industrial Microbiology, San Francisco, CA, 2023.
- Cornell Chemical Biology Interface Symposium, 2022.
- BES2022, Antwerp, Belgium, 2022.
- ICAMD2021, Jeju Island, South Korea, 2021.
- NA-ISMET 2021, University of Southern California, 2021.
- University of Rochester Department of Biology, 2020.
- UT Southwestern Green Center, September 2020.
- MIT A+B Applied Energy conference, August 2020.

## F. Service

- Biological and Environmental Engineering Strategic Plan Committee, 2024 - present.
- CALS 2050 Roadmap panel, 2022.
- Reviewer for Cornell Energy Systems Institute postdoctoral fellowship, 2021
- Guest editor for special issue of *iScience* on electrode-microbe interface, 2021.
- Cornell Delegate to UN Climate Conference, COP26, Glasgow, United Kingdom, 2021.
- Biological and Environmental Engineering Diversity, Equity, and Inclusion Committee, 2020 - present (chair from 2023 - present).
- Organizing committee for MIT A+B Applied Energy Conference, 2020 - present.
- Guest editor for MIT A+B special edition of Applied Energy, 2020 - present.
- Guest Editor for special edition of iScience on biological-inorganic interface, 2021.
- Biological and Environmental Engineering faculty search committees, 2018 - present.
- Faculty Senator for Biological and Environmental Engineering, 2018 - 2023.
- Journal Reviewer for *PNAS, mBio, Biophysical Journal, Genome Research, Metabolic Engineering, Nature Catalysis, Nature Communications, Joule*, and *JACS*.

## H. Selected Media

- *Carl Sagan's 90th Birthday: An Arts Unplugged Celebration*

  Live stream of the Carl Sagan Institute's symposium for Carl Sagan's 90th birthday.

- *Low-cost microbe can speed biological discovery*

  An article in the Cornell Chronicle on our new Microbe-Mineral Atlas project.

- *Low-cost microbe can speed biological discovery*

  An article in the Cornell Chronicle on David Specht and TJ Sheppard's work on engineering natural competence (DNA uptake) into *Vibrio natriegens*.

- *Little bacterium may make big impact on rare-earth processing*

  An article in the Cornell Chronicle on Sean Medin and Stacie Dressel's work on engineering *Vibrio natriegens* for selective rare earth biosorption.

- *Microbial miners take on rare-earth metals*

  A technology feature in Nature on rare earth biomining.

- *Bacteria could be the key to a safer, greener way of processing rare-earth metals*

  An interview on NPR's Marketplace Tech on rare earth separations using engineered microbes.

- *Imaging Shows How Inorganic-Microbe Hybrids Use Light to Turn Carbon Dioxide into Bioplastic*

  An article covering work by Peng Chen in Cornell Chemistry (and us) on how Ralstonia eutropha converts CO2 and electricity to bioplastic on the DOE Office of Science.

- *Researchers Commercialize Rare-earth Tech with I-Corps Help.*

  An article about how Barstow Lab Alum Alexa Schmitz and grad student Sean Medin commercialized rare earth biomining tech developed in our lab on the Cornell Chronicle.

- *Imaging Shows How Solar-Powered Microbes Turn $CO_2$ Into Bioplastic*

  An article covering work by Peng Chen in Cornell Chemistry (and us) on how *Ralstonia eutropha* converts $CO_2$ and electricity to bioplastic on the Cornell Chronicle.

- *NY Lt. Gov. Tour Highlights Sustainability, Equity*

  An article covering the recent visit to our lab by Lt. Governor Antonio Delgado to our lab by the Cornell Chronicle.

- *Entrepreneurs Find Home as Activate Fellows at Praxis Center*

  An article covering Alexa's Activate fellowship, and starting REEgen at the Cornell Praxis Center by the Cornell Chronicle.

- *Rising Women Innovator Awards*

  Here's a great piece on Alexa's Rising Women Innovator award from Cornell Tech Licensing by the Cornell Chronicle. And here's a link to a video about it on YouTube.

- *Engineering Bacteria to Extract Rare Earths*

  Here's a great piece on our rare earth element bio-mining work by the Institute of Materials, Minerals, and Mining.

- *Cornell Engineers Are Pioneering a Novel Method for Mining Metals That Are Key to Unlocking a Sustainable Future*

  Here's a great piece on our rare earth element bio-mining work by Chris Dawson that originally appeared in Cornell Engineering Magazine.

- *Using Microbes, Scientists Aim to Extract Rare-Earth Elements*

Here's a story in the Chronicle about an award we received from ARPA-E for rare earth element bio-mining in the Cornell Chronicle.

- *Engineers Go Microbial to Store Energy, Sequester $CO_2$*

  Here's another piece written by Blaine Friedlander on Farshid's theory of electromicrobial production that appeared in the Cornell Chronicle.

- *Interdisciplinary Team Gets $2M Grant for Bioenergy Conversion*

  Here's a story about an award we received (in collaboration with Peng Chen in Cornell Chemistry, who's the lead professor) in the Cornell Chronicle.

- *Wiring Up Bacteria to the Grid*

  We're quoted by Carl Zimmer from the New York Times.

- *Engineered Bacteria Could Be Missing Link in Energy Storage*

  Here's a piece written by Krishna Ramanujan on Farshid's review of some of the fundamentals of using microbes to store electricity electromicrobial production that appeared in the Cornell Chronicle.

- *Princeton Researchers Propose Biological Solutions to Sustainable Energy Problems*

  You can find more about the challenges of sustainable energy and proposed solutions in our review article in Chem and in a Q&A piece written by Princeton Chemistry's science writer, Tien Nguyen, on the Princeton Chemistry website.

- *Sudoku Strategy Democratizes Powerful Tool for Genetics Research*

  You can find out more about Knockout Sudoku in a great popular piece written by Princeton Chemistry's science writer, Tien Nguyen, on the Princeton Chemistry website.