ZIBO CHEN, PH.D.

1200 E. California Blvd., MC 114-96, Pasadena, CA 91125
(626) · 818 · 7328 ⋄ zibochen@caltech.edu
zibochen.org

EDUCATION AND RESEARCH EXPERIENCE

California Institute of Technology *2019-Present*
Postdoc Scholar, Damon Runyon Fellow
Advisor: Michael Elowitz

University of Washington *2018-2019*
Senior Fellow
Advisor: David Baker

University of Washington *2013-2018*
Ph.D, Biological Physics, Structure and Design program
Dual Degree in Nanotechnology
Advisors: David Baker, Frank DiMaio

National University of Singapore *2009-2013*
B.S., First Class Honours
Life Sciences with a minor in Biophysics

JOURNAL PUBLICATIONS

[14] **Chen, Z.**, Elowitz, M.B. (2021). Programmable protein circuit design. ***Cell*** (In press)

[13] Yu, M., Zhao, Z., **Chen, Z.**, Le, S., Yan, J. (2020). Modulating mechanical stability of heterodimerization between engineered orthogonal helical domains. ***Nat. Commun.*** 11, 4476.

[12] **Chen, Z.**, Kibler, R.D., Hunt, A., Busch, F., Pearl, J., Jia, M., VanAernum, Z.L., Wicky, B.I.M., Dods, G., Liao, H., Wilken, M.S., Ciarlo, C., Green, S., El-Samad, H., Stamatoyannopoulos, J., Wysocki, V.H., Jewett, M.C., Boyken, S.E., Baker, D. (2020). De novo design of protein logic gates. ***Science*** 368, 78-84.

[11] VanAernum, Z.L., Busch, F., Jones, B.J., Jia, M., **Chen, Z.**, Boyken, S.E., Sahasrabuddhe, A., Baker, D., Wysocki, V.H. (2020). Rapid online buffer exchange for screening of proteins, protein complexes and cell lysates by native mass spectrometry. ***Nature Protocols***

[10] **Chen, Z.** (2019). Creating the protein version of DNA base pairing. ***Science*** 366, 965-965.

[9] Langan, A., Boyken, S.E., Ng, A.H., Samson, J.A., Dods, G., Hguyen, T.H., **Chen, Z.**, Berger, S., Lajoie, M.J., Mulligan, V.K., Dueber, J.E., Novak, W.R.P., El-Samad, H., Baker, D. (2019). De Novo design of bioactive protein switches. ***Nature*** 572, 205-210.

[8] Cao, L., Yu, B., Kong, D., Cong, Q., Yu, T., **Chen, Z.**, Hu, Z., Chang, H., Zhong, J., Baker, D., He, Y. (2019). Functional expression and characterization of the envelope glycoprotein E1E2 heterodimer of hepatitis C virus. ***PLoS Pathog***. 15, e1007759.

[7] Boyken, S.E., Benhaim, M.A., Busch, F., Jia, M., Bick, M.J., Choi, H., Klima, J.C., **Chen, Z.**, Walkey, C., Mileant, A., Sahasrabuddhe, A., Wei, K.Y., Hodge, E.A., Byron, S., Quijano-Rubio, A., Sankaran, B., King, N.P., Lippincott-Schwartz, J., Wysocki, V.H., Lee, K.K., Baker, D. (2019). De novo design of tunable, pH-driven conformational changes. ***Science*** 364, 658-664.

[6] **Chen, Z.**, Johnson, M.C., Chen, J., Bick, M.J., Boyken, S.E., Lin, B., De Yoreo, J.J., Kollman, J.M., Baker, D., DiMaio, F. (2019). Self-assembling 2D arrays with de novo protein building blocks. ***J. Am. Chem. Soc.*** 141, 8891-8895.

[5] **Chen, Z.**, Boyken, S.E., Jia, M., Busch, F., Flores-Solis, D., Bick, M.J., Lu, P., Van Aernum, Z.L., Sahasrabuddhe, A., Langan, R.A., Bermeo, S., Brunette, T., Mulligan, V.K., Carter, L.P., DiMaio, F., Sgourakis, N.G., Wysocki, V.H., Baker, D. (2019). Programmable design of orthogonal protein heterodimers. ***Nature*** 565, 106-111.

[4] Lu, P., Min, D., DiMaio, F., Wei, K.Y., Vahey, M.D., Boyken, S.E., **Chen, Z.**, Fallas, J.A., Ueda, G., Sheffler, W., Mulligan, V.K., Xu, W., Bowie, J.U., Baker, D. (2018). Accurate computational design of multipass transmembrane proteins. ***Science*** 359, 1042-1046.

[3] Thubagere, A.J., Li, W., Johnson, R.F., **Chen, Z.**, Doroudi, S., Lee, Y.L., Izatt, G., Wittman, S., Srinivas, N., Woods, D., Winfree, E., Qian, L. (2017). A cargo-sorting DNA robot. ***Science*** 357, eaan6558.

[2] Boyken, S.E., **Chen, Z.**, Groves, B., Langan, R.A., Oberdorfer, G., Ford, A., Gilmore, J.M., Xu, C., DiMaio, F., Pereira, J.H., Sankaran, B., Seelig, G., Zwart, P.H., Baker, D. (2016). De novo design of protein homo-oligomers with modular hydrogen-bond network-mediated specificity. ***Science*** 352, 680-687.

[1] **Chen, Z.**, Tan, J.Y., Wen, Y., Niu, S., Wong, S.-M. (2012). A game-theoretic model of interactions between Hibiscus latent Singapore virus and tobacco mosaic virus. ***PLoS One*** 7, e37007.

PATENTS

2019 Patent Application 62/904,800. "Protein Based Boolean Logic Gates Using Orthogonal Heterodimers". Zibo Chen, Scott Boyken, David Baker

2019 Patent Application PCT/US2020/038048. "De novo design of phosphorylation inducible protein switches (phosphoswitches)". Nicholas Woodall, Scott Boyken, Marc

Lajoie, Zibo Chen, Robert A. Langan, David Baker

2019 Patent Application PCT/US2020/028928. "De Novo Design of Tunable pH Conformational Switches". Scott Boyken, David Baker, Zibo Chen, Alfredo Quijano Rubio, Neil King, Jason Klima, Carl Walkey

2019 Patent Application PCT/US2020/028044. "Self-Assembling 2D Arrays With De Novo Protein Building Blocks". Zibo Chen, David Baker, Frank DiMaio

2019 Patent Application PCT/US2019/19948. "Accurate Computational Design of Multipass Transmembrane Proteins". Peilong Lu, David Baker, Scott E. Boyken, Zibo Chen, Jorge A. Fallas, George Ueda, William Sheffler

2018 Patent Application PCT/US2019/59654. "Programmable design of orthogonal protein heterodimers". Zibo Chen, Scott Boyken, Sherry Bermeo, Robert Langan, David Baker

2017 Patent Application PCT/US2017/025532. "Polypeptides Capable of Forming Homo-Oligomers With Modular Hydrogen Bond Network-Mediated Specificity And Their Design". David Baker, Scott Boyken, Zibo Chen, Chunfu Xu, Sherry Bermeo, Robert A. Langan

AWARDS AND HONORS

2020 Forbes 30 Under 30 (New Jersey, USA)

2020 Burroughs Wellcome Fund Career Award at the Scientific Interface (North Carolina, USA)

2020 The Robert Dirks Molecular Programming Prize (International Society for Nanoscale Science, Computation and Engineering)

2019 Damon Runyon Fellowship Award (New York, USA)

2019 MIT Technology Review 35 Under 35 China (Beijing, China)

2019 Science & SciLifeLab Prize (Stockholm, Sweden)

2019 Hans Neurath Outstanding Promise Award (Seattle, USA)

2019 Protein Science Young Investigator Travel Award (Seattle, USA)

2017 67th Lindau Nobel Laureate Meeting, Fellow of the Boehringer Ingelheim Stiftung (Lindau, Germany)

2017 Urdal Fellowship (University of Washington, USA)

2016 Chinese Government Award for Outstanding Self-Financed Students Abroad (Beijing, China)

2016 30th Annual Protein Society Symposium Best Poster Award (Baltimore, USA)

2016 Protein Science Young Investigator Travel Award (Baltimore, USA)

2016 Benjamin Schultz Endowed Research Fund (University of Washington, USA)

2013 Lee Foundation Medal (NUS, Singapore)

2012 NUS Science Diamond Jubilee SEP Award (NUS, Singapore)

2012 Science Outstanding Undergraduate Research Award (NUS, Singapore)

2011 Gold Award, International Bio-Molecular Design Competition (Harvard University, USA)

2011 Caltech Summer Undergraduate Research Fellowship (Caltech, USA)

2011 Study and Travel Grant (NUS, Singapore)

2011 Dean's Lists (NUS, Singapore)

2010 Dean's Lists (NUS, Singapore)

2009 Dean's Lists (NUS, Singapore)

ACADEMIC TALKS

2021 Broad Institute Next Generation in Biomedicine Symposium (Boston, USA)

2021 Princeton University (Princeton, USA)

2020 National University of Singapore (Singapore)

2020 Harvard University (Boston, USA)

2019 Karolinska Institute (Stockholm, Sweden)

2019 Uppsala University (Uppsala, Sweden)

2019 University of California, Berkeley (Berkeley, USA)

2019 Molecular Programming Project Workshop Retreat (Pasadena, USA)

2019 Tsinghua University (Beijing, China)

2019 Zhejiang University (Hangzhou, China)

2019 Peking University (Beijing, China)

2018 Fudan University (Shanghai, China)

2018 Westlake Institute for Advanced Studies (Hangzhou, China)

2018 RosettaCON (Leavenworth, USA)

2018 DARPA SD2 Meeting (Seattle, USA)

2017 3rd BioOrigami Meeting (Ljubljana, Slovenia)

CONFERENCE PRESENTATIONS

2020 Pujiang Young Elite Scientists Summit (Virtual)

2020 Burroughs Wellcome Fund New Awardee Networking Meeting (Virtual)

2019 33rd Annual Protein Society Symposium (Seattle, USA)

2018 RosettaCON (Leavenworth, USA)

2018 DARPA SD2 Meeting (Seattle, USA)

2017 RosettaCON (Leavenworth, USA)

2017 Gordon Research Conference in Synthetic Biology (Stowe, USA)

2017 67th Lindau Nobel Laureate Meeting (Lindau, Germany)

2017 3rd BioOrigami Meeting (Ljubljana, Slovenia)

2016 RosettaCON (Leavenworth, USA)

2016 30th Annual Protein Society Symposium (Baltimore, USA)

2016 2nd BioOrigami Meeting (Seattle, USA)

2016 Molecular Programming Project Workshop (Seattle, USA)

2015 RosettaCON (Leavenworth, USA)

2014 RosettaCON (Leavenworth, USA)

MEDIA COVERAGE

Nature Methods, 2020
Designing protein logic gates
https://go.nature.com/3fbaUy3

Physics Today, 2020
Designer proteins act as logic gates
https://bit.ly/2z0woh8

Genetic Engineering and Biotechnology News, 2020
Artificial Proteins Give Living Cells a Computational Upgrade
https://bit.ly/2Xcjl6p

Phys.org, 2020
Turning cells into computers with protein logic gates
https://bit.ly/2R6ZwJK

SciLifeLab, 2019
High-flying Zibo Chen awarded for engineered proteins
https://bit.ly/2qBbrFC

The Economist, 2019
The applications of synthetic biology are endless
https://econ.st/2CYTYKd

Phys.org, 2018
Scientists program proteins to pair exactly
https://bit.ly/32KQN4d

Geekwire.com, 2016
Scientists add twists to protein designs
https://bit.ly/2Y6AOtK

JOURNAL REVIEWER

ACS Synthetic Biology ◇ Acta Biomaterialia ◇ Scientific Reports ◇ Biomedicine & Pharmacotherapy ◇ Journal of Biological Physics ◇ Protein & Peptide Letters ◇ PeerJ ◇ The Protein Journal ◇ Protein Expression and Purification

TEACHING EXPERIENCE

Winter 2014, Human Physiology *Teaching Assistant*
Course Instructor: Linda Wordeman, Department of Physiology and Biophysics, University of Washington.

Fall 2014, Advanced Biochemistry *Teaching Assistant*
Course Instructor: David Baker, Department of Biochemistry, University of Washington.

Spring 2013, Unconventional Computing *Guest Lecturer*
Course Instructor: Eric Klavins, Department of Electrical Engineering, University of Washington.

MENTEES ADVISED

Undergraduate Student: Baihan Lin

Graduate Students: Allison Maker, Sherry Bermeo, Philip Ketterer, Ryan Kibler, Michael Xie

SOCIETY MEMBERSHIPS

The Protein Society

International Society for Nanoscale Science, Computation and Engineering