

FEI ZHANG

ACADEMIC POSITIONS AND EDUCATION

- 2019 – Present **Assistant Professor**, Department of Chemistry
Rutgers University-Newark, Newark
- 2016 - 2019 **Assistant Research Professor**, Center for Molecular Design and Biomimetics
The Biodesign Institute, Tempe
- 2015 - 2016 **Assistant Research Scientist**, Center for Molecular Design and Biomimetics
The Biodesign Institute, Tempe
- 2010 - 2015 **Ph.D.** in Chemistry and Biochemistry
Arizona State University, Tempe
- 2006 - 2010 **B.S.** in Chemistry and Molecular Engineering
Peking University, Beijing

AWARDS AND HONORS

- 2021 NSF Faculty Early Career Development (CAREER) Award
- 2018 Robert Dirks Molecular Programming Prize (<https://dirksprize.caltech.edu/recipients>)
International Society for Nanoscale Science, Computation and Engineering
- 2015 Outstanding Graduate Research Assistant, Arizona State University
- 2012 SUN (Serving University Needs) Award, Arizona State University
- 2011 Doctoral Student Fellowship, Arizona State University

JOURNAL PUBLICATIONS

[Google Scholar](#) (Citations: 2737, H-Index: 21)

* *Corresponding author; # Co-first author*

32. G. Yao[#], F. Zhang[#], F. Wang[#], T. Peng, H. Liu, E. Poppleton, P. Šulc., S. Jiang, L. Liu, C. Gong, X. Jing, X. Liu, L. Wang, Y. Liu, C. Fan*, H. Yan*. Meta-DNA Structures. **Nature Chemistry** 12, 1067 (2020).
31. C. Simmons, T. MacCulloch, F. Zhang, Y. Liu, N. Stephanopoulos*, H. Yan*. A Self-assembled Rhombohedral DNA Crystal Scaffold with Tunable Cavity Sizes and High-Resolution Structural Detail. **Angewandte Chemie International Edition** 59, 18619 (2020).
30. S. Jiang, F. Zhang, H. Yan*. Complex assemblies and crystals guided by DNA. **Nature Materials** 19, 694 (2020).
29. E. Poppleton, J. Bohlin, M. Matthies, S. Sharma, F. Zhang, P. Šulc*. Design, Optimization, and Analysis of Large DNA and RNA Nanostructures through Interactive Visualization, Editing, and Molecular Simulation. **Nucleic Acids Research** 12, e72 (2020).
28. X. Qi, X. Liu, L. Matiski, R. Del Villar, T. Yip, F. Zhang, S. Sokalingam, S. Jiang, L. Liu, H. Yan, Y. Chang*. RNA Origami Nanostructures for Potent and Safe Anti-Cancer Immunotherapy. **ACS Nano** 14, 4727 (2020).
27. X. Fu, F. Peng, J. Lee, Q. Yang, F. Zhang, M. Xiong, G. Kong, H. Meng, G. Ke, X. Zhang*. Aptamer-Functionalized DNA Nanostructures for Biological Applications. **Topics in Current Chemistry** 378, 21 (2020).
26. X. Jing[#], F. Zhang[#], M. Pan, X. Dai, J. Li, L. Wang, X. Liu, H. Yan, C. Fan. Solidifying Framework Nucleic Acids with Silica. **Nature Protocols** 14, 2416 (2019).
25. Y. Zhou, X. Qi, Y. Liu, F. Zhang*, H. Yan*. DNA Nanoscaffold-Assisted Selection of Femtomolar Bivalent Aptamers for Human α -Thrombin with Potent Anticoagulant Activity. **ChemBioChem** 20, 2494 (2019).

24. H. Jun[#], F. Zhang[#], S. Ratanalert, T. Shepherd, X. Qi, H. Yan, M. Bathe*. Autonomously Designed Free-Form DNA Origami. *Science Advances* 5, eaav0655 (2019).
23. C. Su, J. Weir, F. Zhang, H. Yan, T. Wu*. ENTRNA: A Framework to Predict RNA Foldability. *BMC Bioinformatics* 20, 373 (2019).
22. Y. Xu, S. Jiang, C. Simmons, R. Narayanan, F. Zhang, A. Aziz, H. Yan, N. Stephanopoulos*. Tunable Nanoscale Cages from Self-Assembling DNA and Protein Building Blocks. *ACS Nano* 13, 3545 (2019).
21. X. Qi[#], F. Zhang^{**}, Z. Su[#], S. Jiang, D. Han, Y. Liu, W. Chiu, P. Yin, H. Yan*. Programming Molecular Topologies from Single-stranded Nucleic Acids. *Nature Communications* 9, 4579 (2018).
20. F. Hong, S. Jiang, X. Lan, R. N. Pradeep, P. Sulc, F. Zhang*, Y. Liu*, H. Yan*. Layered-Crossover Tiles with Precisely Tunable Angles for 2D and 3D DNA crystal Engineering. *Journal of the American Chemical Society* 140,14670 (2018).
19. X. Liu[#], F. Zhang[#], X. Jing[#], M. Pan, P. Liu, W. Li, B. Zhu, J. Li, H. Chen, L. Wang, J. Lin, Y. Liu, D. Zhao, H. Yan, C. Fan. Complex Silica Composite Nanomaterials Template with DNA Origami. *Nature* 559, 593 (2018).
18. F. Zhang[#], C. Simmons[#], J. Gates, Y. Liu, H. Yan. Self-assembly of a 3D DNA Crystal Structure with Rationally Designed Six-Fold Symmetry. *Angewandte Chemie International Edition* 130, 12684 (2018).
17. D. Han, X. Qi, C. Myhrvold, B. Wang, M. Dai, S. Jiang, M. Bates, Y. Liu, B. An*, F. Zhang*, H. Yan*, P. Yin*. Single-stranded DNA and RNA Origami. *Science* 358, eaao2648 (2017).
16. C. Simmons, F. Zhang, T. MacCulloch, N. E. Fahmi, N. Stephanopoulos, Y. Liu, N. Seeman, H. Yan. Tuning the Cavity Size and Chirality of Self-Assembling 3D DNA Crystals. *Journal of the American Chemical Society* 139, 11254 (2017).
15. F. Zhang, H. Yan. DNA Self-assembly Scaled Up. *Nature* 552, 34 (2017).
14. F. Zhang, F. Hong, H. Yan. DNA Origami Tiles: Nanoscale Mazes. *Nature Nanotechnology* 12, 189 (2017).
13. F Hong, F. Zhang, Y. Liu, H. Yan. DNA Origami: Scaffolds for Creating Higher Order Structures. *Chemical Reviews* 117, 12584 (2017).
12. C. Simmons, F. Zhang, J. Birktoft, D. Han, Y. Liu, R. Sha, H. Abdallah, C. Hernandez, Y. Ohayon, N. C. Seeman, H. Yan. Construction and Structure Determination of a Self-Assembling DNA Crystal. *Journal of the American Chemical Society* 138, 10047 (2016).
11. R. Veneziano, S. Ratanalert, K. Zhang, F. Zhang, H. Yan, W. Chiu, M. Bathe. Designer Nanoscale DNA Assemblies Programmed from the Top Down. *Science* 352, 1534 (2016).
10. G. Ke, M. Liu, S. Jiang, X. Qi, Y. Yang, S. Wootten, F. Zhang, Z. Zhu, Y. Liu, C. Yang, H. Yan. Directional Regulation of Enzyme Pathways through the Control of Substrate Channeling on a DNA Origami Scaffold. *Angewandte Chemie International Edition* 55, 7483 (2016)
9. W. Li, F. Zhang, Y. Liu, H. Yan. Half Adder Based on DNA Strand Displacement. *Nanoscale* 8, 3775 (2016).
8. F. Zhang, S. Jiang, W. Li, A. Hunt, Y. Liu, H. Yan. Self-Assembly of Complex DNA tessellations. *Angewandte Chemie International Edition* 55, 8860 (2016).
7. F. Zhang, S. Jiang, S. Wu, Y. Li, C. Mao, Y. Liu, H. Yan. Complex Wireframe DNA Origami Nanostructures with Multi-Arm Junction Vertices. *Nature Nanotechnology* 10, 779 (2015).
 - Featured as **cover story** of the September 2015 issue of *Nature Nanotechnology*.
6. X. Ye, F. Zhang, Y. Ma, L. Qi. Brittlestar-Inspired Microlens Arrays Made of Calcite Single Crystals. *Small* 11, 1677 (2015).
5. K. Pan, D. N. Kim, F. Zhang, M. Adendorff, H. Yan, M. Bathe. Lattice-Free Prediction of Three-Dimensional Structure of Programmed DNA Assemblies. *Nature Communications* 5, 5078 (2014).

4. F. Zhang, J. Nangreave, Y. Liu, H. Yan. Structural DNA Nanotechnology: State of the Art and Future Perspective. *Journal of the American Chemical Society* 136, 11198 (2014).
3. Y. Yang, Z. Zhao, F. Zhang, J. Nangreave, Y. Liu, H. Yan. Self-Assembly of DNA Rings from Scaffold Free DNA Tiles. *Nano Letters* 13, 1862 (2013).
2. F. Zhang, Y. Liu, H. Yan. Complex Archimedean Tiling Self-Assembled from DNA Nanostructures. *Journal of the American Chemical Society* 135, 7458 (2013).
1. F. Zhang, J. Nangreave, Y. Liu, H. Yan. Reconfigurable DNA Origami to Generate Quasi-Fractal Patterns. *Nano Letters* 12, 3290 (2012).

PATENT APPLICATIONS

3. H. Yan, F. Zhang, X. Qi, "Highly knotted molecular topologies from single-stranded nucleic acids", United State patent application number 17/050918
2. H. Yan, Y. Chang, X. Liu, F. Zhang, X. Qi, "RNA nanostructures and methods of making and using RNA nanostructures" PCT/US 18/048973
1. Y. Chang, H. Yan, X. Qi, F. Zhang, "RNA-nanostructured double robots and methods of use thereof", PCT/US 16/954458

INVITED PRESENTATIONS

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| 2021-Sep | Seminar , Department of Chemistry, Rutgers University-Camden, Camden, NJ |
| 2021-Jul | Talk , Summer Virtual Workshop for DNA Computation Design, Camden, NJ |
| 2021-Feb | Talk , Chancellor Research Day, Rutgers University, Newark, NJ |
| 2020-Oct | Seminar , Institute for Quantitative Biomedicine, Piscataway, NJ |
| 2020-Mar | Seminar , Department of Chemistry, William Paterson University, Wayne, NJ |
| 2019-Oct | Seminar , College of Staten Island and Graduate Center, City University of New York, Staten Island, NY |
| 2019-Oct | Seminar , Department of Chemistry, New York University, New York, NY |
| 2019-Sep | Talk , Peking University- Rutgers University Bilateral Symposium, Peking University, Beijing |
| 2019-May | Seminar , School of Medicine, Shanghai Jiao Tong University, Shanghai |
| 2019-May | Seminar , Shanghai Institute of Applied Physics, Chinese Academy of Sciences, Shanghai |
| 2019-Apr | Seminar , Department of Chemistry, Tsinghua University, Beijing |
| 2019-Feb | Seminar , Department of Chemistry, University of Kentucky, Lexington, KY |
| 2019-Jan | Seminar , Department of Chemistry and Chemical Biology, Northeastern University, Boston, MA |
| 2019-Jan | Seminar , Department of Chemistry, Rutgers University-Newark, Newark, NJ |
| 2018-Apr | Robert Dirks Prize Lecture , 15 th Annual Conference on Foundations of Nanoscience, Snowbird, UT |
| 2017-Sep | Talk , 23 st International Conference on DNA Computing and Molecular Programming, Austin, TX |
| 2013-Sep | Talk , 19 th International Conference on DNA Computing and Molecular Programming, Tempe, AZ |

TEACHING AND MENTORING

CLASS TAUGHT

- 26:160:591 **Special Topics in Materials Chemistry: Biomolecular Design and Nanotechnology**
(Fall 2019, Spring 2021)
- 21:160:345 **Physical Chemistry I**
(Fall 2020, Fall 2021)

PHD STUDENTS

5. **Tiffany R. Olivera** Ph.D. Chemistry Department Rutgers University, Newark (2021 Fall - Present)
4. **Minu Saji** Ph.D. Chemistry Department Rutgers University, Newark (2021 Fall - Present)
3. **Xu Leo Chang** Ph.D. Chemistry Department Rutgers University, Newark (2020 Spring - Present)
2. **Jungyeon Alice Lee** Ph.D. Chemistry Department Rutgers University, Newark (2019 Fall - Present)
1. **Qi Maggie Yang** Ph.D. Chemistry Department Rutgers University, Newark (2019 Fall - Present)

M.S. STUDENTS

1. **Alisa Xhambazi** Chemistry Department Rutgers University, Newark (2019-2020)

UNDERGRADUATE RESEARCH MENTORING

6. **Alejandro Garavito** Montclair State University (2021- Present)
5. **Kaylee Maya** Chemistry Department Rutgers University, Newark (2021 summer)
4. **Maria Shawky** Chemistry Department Rutgers University, Newark (2020 - 2021)
3. **Marina Tadrosse** Chemistry Department at Rutgers University, Newark (2019 - 2020)
2. **Jade Gates** Chemistry Department at Arizona State University (2017 - 2018) – co-author
1. **Ashley Hunt** Chemistry Department at Arizona State University (2013 - 2015) – co-author

PHD COMMITTEE

1. **Congzhe Su** School of Computing, Informatics, Decision Systems Engineering at Arizona State University (2015-2018)

PROFESSIONAL SERVICES

SERVICE – UNIVERSITY

- **Admission Committee** for Graduate Program at Rutgers University, Newark (2020 Spring, 2020 Fall, 2021 Spring, 2021 Fall)
- **Panelist** for 'Mentoring: Learn from the Best', The Biodesign Institute, Tempe, Arizona, 2017

SERVICE - CONFERENCE

- **Program Committee** 27th International Conference on DNA Computing and Molecular Programming, Oxford, UK, 2021
- **Program Committee** 26th International Conference on DNA Computing and Molecular Programming, virtual conference, 2020
- **Faculty committee** 3rd FUSION Scientific Retreat, Carefree, Arizona, 2018
- **Session Chair** 23rd International Conference on DNA Computing and Molecular Programming, Austin, Texas, 2017

SERVICE – PROPOSAL AND MANUSCRIPT REVIEW

- **Panelist:**
 - National Science Foundation (2021)
- **Ad hoc reviewer:**
 - Air Force Office of Scientific Research (2016)
 - Department of Energy Office of Science (2021)
 - Busch Biomedical Grants Program (2021)

- **Reviewer for journals:**

ACS Applied Materials & Interfaces, ACS Nano, ACS Sensors, ACS Synthetic Biology, Advanced Healthcare Materials, Analyst, Analytical Chemistry, Angewandte Chemie, Biomacromolecules, Biomicrofluidics, Biophysical journal, Chem, ChemBioChem, ChemComm, Computational and Structural Biotechnology Journal, Chemical Science, Journal of Visualized Experiments, Materials Science and Engineering: R: Reports, Nature Chemistry, Nano Letters, Nanomedicine and Nanobiotechnology, Nanoscale, Nano Research, Nucleic Acids Research, Proceedings of the National Academy of Sciences, PLOS ONE, RSC Advances, Scientific Reports, Sensors and Actuators B Chemical, Small