

John P. Sadowski, Ph.D.

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I combine technical expertise in nanotechnology with a strong focus on communication and outreach. My research has focused on developing dynamic nucleic acid systems that can respond to and control their chemical and physical environment in intricate ways, and the computational methods for designing them.

Key Skills

- Technical expertise in nanotechnology, DNA biophysics, and chemistry
- 14 years of research experience including both experimental and computational work
- Robust ability to communicate complex topics simply to both technical and lay audiences, including peer-reviewed journal articles, policy position papers, and Wikipedia articles
- Robust oral presentation ability, including technical presentations, communications training workshops, and theater performance
- Ability to independently initiate and carry out projects, and to bring in new partners through networking
- Record of success in securing funding through individual research fellowships

Professional Experience

National Institute for Occupational Safety and Health Office of the Director

Technical Analyst / Senior Wikipedian-in-Residence (2017–present)

- Disseminated workplace health and safety information through improving high-visibility Wikipedia articles, with a focus on nanomaterials health and safety
- Coordinated and presented multiple Wikipedia training workshops for scientists and staff
- Wrote 13 Wikipedia articles; mentored others in writing 3 more

Wikimedia District of Columbia

Treasurer (2016–present), Member of Board of Directors (2014–present)

- Participated in governance and programs for official regional chapter to run in-person Wikipedia outreach and training events (501(c)(3) organization with ~\$150k annual budget)
- Delivered training sessions to Office of Science and Technology Policy, American Chemical Society (5 times), National Academies, Dept. of Defense, Harvard Kennedy School (3 times), and others
- Initiated and managed development of chapter's policy positions on copyright law issues
- Contributor to Wikipedia since 2006. Made over 31,000 edits, mostly on nanotechnology, biomolecular structure, and science policy; contributed to 84 articles that appeared in Main Page's *Did you know* column

United States Naval Research Laboratory Center for Biomolecular Science and Engineering

Postdoctoral Fellow (2014–2015)

- Initiated project to design dynamic DNA nanostructures incorporating optically active molecules
- Secured funding through American Society for Engineering Education Postdoctoral Fellowship
- Presented research at conferences in the United States and Germany

National Academy of Sciences Board on Chemical Science and Technology

Mirzayan Science and Technology Policy Fellow (2014)

- Awarded competitive fellowship for early-career scientists to participate in science policy
- Wrote background paper for committee on industrialization of synthetic biology for chemical manufacturing

Harvard University Department of Chemistry and Chemical Biology

Graduate Student in Chemistry — *Advisors: Prof. Peng Yin (2010–2013), Prof. David Liu (2007–2009)*

- Successfully created first well-defined three-dimensional nanostructure using dynamic DNA self-assembly
- Programmed a general software tool to design sequences for large, complex nucleic acid systems
- Investigated creating macroscopic programmable matter using designed surface DNA interactions

- Secured funding through NSF Graduate Research Fellowship and Buttonwood Foundation Graduate Scholarship
- Two first-author publications; presented research in United States, Denmark, and Japan
- Teaching Fellow for two courses: prepared lesson plans and taught sections; wrote and graded sets and exams

California Institute of Technology Department of Chemistry

Undergraduate Research Fellow — *Advisors: Prof. Peter Dervan (2004–2007), Prof. James Heath (2003)*

- Initiated project to create and characterize new class of DNA–organic complexes for molecular self-assembly
- Contributed to fabrication of a nanoscale biosensor to provide real-time monitoring of cellular molecules
- Research published in *Angewandte Chemie* and *Journal of the American Chemical Society*
- Awarded Caltech Axline Merit Award (4 year full-ride scholarship)
- Studied abroad at University College London

New York University Department of Chemistry

Visiting High School Student — *Advisor: Prof. Nadrian Seeman (2001–2003)*

- Initiated project to create DNA nanostructures for potential use in molecular electronics
- Won national finalist awards in Intel, Siemens–Westinghouse, and JSHS research competitions

Education

Harvard University: Ph.D., Chemistry, 2013; M.A., Chemistry, 2009

California Institute of Technology: B.S. with Honor, Chemistry; minor in History & Philosophy of Science, 2007

Other Interests

- Acted in 3 musicals and 9 plays at Caltech and MIT; co-wrote, directed, edited, and acted in short film
- Performance experience in piano, clarinet, ensemble chorus, and swing dance
- Student government experience in high school, college, and graduate school
- Chairperson of Avery Constitutional Convention: managed the process to create a new constitution for Avery House student residence at Caltech to create an acceptable consensus on controversial issues
- Eagle Scout with three palms

Publications

Peer-Reviewed Publications

1. **Multisubjective: nucleic acid design through fast removal of undesired secondary structure**
J. P. Sadowski. Submitted (2017).
2. **Developmental self-assembly of a DNA tetrahedron**
J. P. Sadowski, C. R. Calvert, D. Y. Zhang, N. A. Pierce, and P. Yin. *ACS Nano* 8, 3251–9 (2014).
3. **Programming multiple protein patterns on a single DNA nanostructure**
J. D. Cohen, J. P. Sadowski, and P. B. Dervan. *Journal of the American Chemical Society* 130, 402–3 (2008).
4. **Addressing single molecules on DNA nanostructures**
J. D. Cohen, J. P. Sadowski, and P. B. Dervan. *Angewandte Chemie Int. Ed.* 46, 7956–9 (2007).

Non-technical Publications

How the Internet changed chemistry: spreading science globally with Wikipedia

J. P. Sadowski. *Chemical & Engineering News*, 17 August 2015.

Selected Conferences and Seminars

WikiConference North America, San Diego, CA (2017) [Panel discussion (organizer)]

George Mason University Dept. of Chemistry and Biochemistry, Fairfax, VA (2016) [Departmental seminar]

Technische Universität Dresden Center for Advancing Electronics, Dresden, Germany (2015) [Departmental seminar]

Wikimedia Affiliates Conference, Berlin, Germany (2015) [Invited talk]

MAD Nano 1, Baltimore, MD (2014) [Invited talk]

DNA Computing and Molecular Programming 19, Tempe, AZ (2013) [Contributed talk]

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