

Contact Information

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Birth

March 5, 1980
Washington, D.C.

Professional Memberships

American Chemical Society
American Physical Society
The Electrochemical Society

EDUCATION

Candidate for Doctor of Philosophy in Chemistry (2002–present)

Harvard University, Cambridge, MA
Advisor: Professor George M. Whitesides

Bachelor of Science in Chemistry with Departmental Honors, *Summa Cum Laude* (1998–2002)

New York University, New York, NY
Unweighted Cumulative GPA: 3.966/4.000; GPA in Major: 4.000/4.000
Advisor: Professor David I. Schuster
Thesis Title: The Synthesis and Photophysics of Porphyrin–Fullerene Dyads

Fairfax County Advanced Studies High School Diploma (1994–1998)

Thomas Jefferson High School for Science and Technology, Alexandria, VA
Unweighted Cumulative GPA: 4.000/4.000
Advisor: Dr. John Liebermann, Chemical Analysis Laboratory
Senior Project: “The Effect of Counteranion Structure on the Critical Micelle Concentration of Tetradecyltrimethylammonium (TTA⁺)”

HONORS AND AWARDS

Harvard Origins of Life Initiative Graduate Fellow (2006)
Dudley R. Herschbach Teaching Award (2005)
Harvard Committee on Undergraduate Education (CUE) Certificate of Distinction in Teaching (2003)
National Science Foundation Graduate Research Fellow (2002–2005)
Albert S. Borgman/Phi Beta Kappa Prize for Best Thesis at NYU in the Natural Sciences (2002)
NYU College of Arts and Science Class Commencement Representative (2002)
New York University Distinguished Chemist Award (2002)
New York University Honors Scholar (2002)
Phi Beta Kappa, Beta of New York Chapter (2001)
Barry M. Goldwater Scholar (2001)
Harold Seidenstein Memorial Award in Chemistry (2001)
Arnold and Mabel Beckman Foundation Research Scholar (2000–2001)
Phi Lambda Upsilon, Alpha Lambda Chapter, Honorary Chemistry Society (2000)
Hema Sakhrani Memorial Award in Chemistry (1999)
Samuel F.B. Morse Scholar (1998–2002)
United States Office of Naval Research Scholar (1998–2002)
NYU College of Arts and Science Dean's List (1998–2002)
United States National Chemistry Olympiad Team (1998)
USA TODAY All-USA High School Academic Team (1998)
Virginia Science Talent Search Grand Prize (1998)
Westinghouse Science Talent Search Finalist (1998)
Washington Metro Area Chess League Best First Board, Southern Division (1997)
Advanced Placement Scholar with Honors (1997)
Phi Theta Kappa Honor Society for Junior Colleges, Alpha Beta Rho Chapter (1996)
Northern Virginia Community College Honor Roll (1996–1998)
McLean Soccer Referee of the Year (1996)

RESEARCH EXPERIENCE

Harvard University, 11/2002–present

Department of Chemistry and Chemical Biology, Advisor: Professor George M. Whitesides

Graduate student in the laboratory of Professor George M. Whitesides, studying multivalency, microfabrication, and the origin of life on prebiotic Earth. Our current research focuses on developing multivalent binding systems suitable for use in biological research and exploring chemistry related to bioenergetic systems possibly involved in the origin of life.

New York University, 1/1999–8/2002

Department of Chemistry, Advisor: Professor David I. Schuster

Undergraduate student in the laboratory of Professor David I. Schuster, studying organic synthesis, photochemistry, and electron transfer. Worked on the synthesis and photophysical study of two porphyrin–fullerene hybrids, compounds that are capable of mimicking the early events of photosynthesis. The first, a copper porphyrin–styrene–C₆₀ hybrid, was the earliest example of a copper hybrid in this field. The second, a concatenated porphyrin–fullerene dyad, is one of the few examples of a hybrid with a non-covalent linkage between the donor and acceptor chromophores. Directly supervised the experimental work of an ACS Project SEED high school student on the synthesis of a family of metalloporphyrin–fullerene dyads.

Thomas Jefferson High School for Science and Technology, 6/1997–5/1998

Chemical Analysis Laboratory, Advisor: Dr. John Liebermann

High school student in the laboratory of Dr. John Liebermann, studying interfacial chemistry and the hydrophobic effect. Examined the effects of varying the organic counteranion of a cationic surfactant to control its critical micelle concentration. Entered project into the 57th annual Westinghouse (now Intel) Science Talent Search and advanced to the Science Talent Institute competition in Washington, D.C. Won first place in the Virginia Science Talent Search. Advanced to the 49th annual International Science and Engineering Fair (ISEF) in Fort Worth, Texas, and won a first place scholarship from the U.S. Office of Naval Research.

TEACHING EXPERIENCE

Research Mentor for Harvard Undergraduate Shawn Liu, 2/2005–6/2006

Harvard University, Department of Chemistry and Chemical Biology, Advisor: Prof. George M. Whitesides

Teaching Fellow for Chem 30: “Organic Chemistry”, 9/2004–1/2005

Harvard University, Department of Chemistry and Chemical Biology, Instructor: Prof. David A. Evans

Teaching Fellow for Chem 30: “Organic Chemistry”, 9/2003–1/2004

Harvard University, Department of Chemistry and Chemical Biology, Instructor: Prof. M.-Christina White

Teaching Fellow for Chem 27: “The Organic Chemistry of Life”, 2/2003–6/2003

Harvard University, Department of Chemistry and Chemical Biology, Instructor: Prof. Gavin MacBeath

Research Mentor for American Chemical Society Project SEED Student Shah R. Ali, 6/2001–3/2002

New York University, Department of Chemistry, Advisor: Prof. David I. Schuster

Teaching Assistant for “Organic Chemistry Laboratory II”, 1/2000–5/2000

New York University, Department of Chemistry, Instructor: Prof. Morris L. Fishman

TECHNICAL PROFICIENCY

Chemical Methods

Organic Synthesis and all Requisite Setup, Purification, and Characterization Methods, Glove Box Operation, Microfabrication (Functionalized SiO₂ Microspheres)

Biological Methods

Recombinant DNA Techniques, PCR, Protein Expression/Purification, Gel Electrophoresis

Instruments and Analytical Methods

NMR Spectroscopy (1D,2D), Mass Spectrometry (APCI, MALDI-TOF, GC/MS), Gas Chromatography, HPLC, Capillary Electrophoresis, UV-vis and FT-IR Spectroscopy, Ge-diode Near-IR Spectroscopy, Fluorimetry, Optical and Fluorescence Microscopy, Scanning Electron Microscopy (SEM), Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES)

Computer/Information Technology

College Courses in Programming, Telecommunications, Hardware Troubleshooting & Repair
MS Office (Word, Excel, Powerpoint, Access, FrontPage, Outlook), Lotus Notes
ChemOffice (Draw, 3D, Inventory), SciFinder Scholar, Beilstein CrossFire, ISIS Draw/Base, ChemACX Database
Multimedia: Adobe Photoshop, Adobe Illustrator, Macromedia DreamWeaver, CorelDraw, Corel Photo-Paint, Sony Vegas
Programming Languages: C++, PASCAL, HTML, TI-81/82/83/85/89

RESEARCH ACCOMPLISHMENTS

Peer-Reviewed Articles

4. Winkleman, A.; Bracher, P.J.; Gitlin, I.; Whitesides, G.M. "Fabrication and Manipulation of Ionotropic Hydrogels Cross-Linked by Paramagnetic Ions." *Chem. Mater.* **2007**, *19*, 1362-1368.
3. Krishnamurthy, V.M.; Semetey, V.; Bracher, P.J.; Shen, N.; Whitesides, G.M. "Dependence of Effective Molarity on Linker Length for an Intramolecular Protein-Ligand System." *J. Am. Chem. Soc.* **2007**, *129*, 1312-1320.
2. Li, K.; Bracher, P.J.; Guldi, D.M.; Herranz, M.Á.; Echegoyen, L.; Schuster, D.I. "[60]Fullerene-Stoppered Porphyrinorotaxanes: Pronounced Elongation of Charge-Separated-State Lifetimes." *J. Am. Chem. Soc.* **2004**, *126*, 9156-9157.
1. Guldi, D.M.; Nuber, B.; Bracher, P.J.; Alabi, C.A.; MacMahon, S.; Kukol, J.W.; Wilson, S.R.; Schuster, D.I. "Synthesis and Photophysics of a Copper-Porphyrin-Styrene-C₆₀ Hybrid." *J. Phys. Chem. A* **2003**, *107*, 3215-3221.

Book Chapters

1. Bracher, P.J.; Schuster, D.I. D.M. Guldi and N. Martín (eds.) "Electron Transfer in Functionalized Fullerenes" in *Fullerenes: From Synthesis to Optoelectronic Properties*. Kluwer Academic Publishers: Dordrecht, The Netherlands, 2002, pp 163-212.

Invited Lectures

1. David I. Schuster's 70th Birthday Symposium, New York University, New York City, 6/3/2005
"High Affinity Reversible Binders Compatible with Biology"

Meeting/Conference Presentations (Oral)

4. Fourth Annual Beckman Scholars Research Symposium, Irvine, California, 8/25-28/2002
"The Synthesis and Photophysics of Porphyrin-Fullerene Dyads"
3. NYU College of Arts and Science Undergraduate Research Symposium, New York City, 4/26/2002
"The Synthesis of Porphyrin-Fullerene Dyads"
2. 197th Meeting of the Electrochemical Society, Toronto, Canada, 4/14-19/2000
Division N1: Fullerenes Group, Subdivision: Photoinduced Processes
"The Synthesis and Photophysical Properties of Alkene- and Stilbene-Linked Fullerene-Porphyrin Dyads"
1. Virginia Junior Academy of Sciences Annual Meeting, George Mason University, Fairfax, Virginia, 5/1998
Chemistry "A" Division
"The Effect of Counteranion Structure on the Critical Micelle Concentration of TTA⁺"

Meeting/Conference Presentations (Poster)

2. NYU College of Arts and Science Undergraduate Research Symposium, New York City, 4/27/2001
"The Synthesis of a Concatenated Fullerene-Porphyrin Dyad"
1. NYU College of Arts and Science Undergraduate Research Symposium, New York City, 4/28/2000
"The Synthesis and Photophysical Properties of Alkene- and Stilbene-Linked Fullerene-Porphyrin Dyads"