

**Contact Information**

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**Birth**

March 5, 1980  
Washington, D.C.

**Professional Memberships**

American Chemical Society  
The Electrochemical Society

**EDUCATION****Postdoctoral Scholar in Chemistry (2010–present)**

California Institute of Technology, Pasadena, CA  
Advisor: Professor Harry B. Gray

**Doctor of Philosophy in Chemistry (2002–2010)**

Harvard University, Cambridge, MA  
Advisor: Professor George M. Whitesides  
Thesis Title: "I. Delivery Templates of Patterned Paper for the Fabrication of Planar Materials,  
II. Thiol–Thioester Exchange as a Reversible, Covalent Binding Interaction"

**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 C.M.C. of Tetradecyltrimethylammonium (TTA<sup>+</sup>)"

**AWARDS AND RECOGNITION**

National Science Foundation American Competitiveness in Chemistry Postdoctoral Fellow (2010–2011)  
Fieser Student Lecture Prize at Harvard (2009)  
Harvard Origins-of-Life Initiative Fellow (2006–2009)  
Dudley R. Herschbach Teaching Award at Harvard (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 of 2002 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 at NYU (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 at NYU (1999)  
Samuel F.B. Morse Scholar at NYU (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/Intel Science Talent Search Finalist (1998)  
Phi Theta Kappa Honor Society for Junior Colleges, Alpha Beta Rho Chapter (1996)

## RESEARCH SYNOPSES

### **California Institute of Technology, 4/2010–present**

#### **Division of Chemistry and Chemical Engineering, Advisor: Prof. Harry B. Gray**

As a National Science Foundation ACC Postdoctoral Fellow in the laboratory of Professor Harry B. Gray, I work on developing electrochemical cells that can be recharged with solar energy and understanding the chemistry of these systems.

### **Harvard University, 9/2002–3/2010**

#### **Department of Chemistry and Chemical Biology, Advisor: Prof. George M. Whitesides**

As a National Science Foundation Graduate Fellow and Harvard Origins Fellow in the laboratory of Professor George M. Whitesides, I conducted research in a broad range of areas, including materials chemistry, microfabrication, multivalency, and origin-of-life chemistry. Highlights of this work include our development of paper-based delivery templates to fabricate planar materials such as films of ionotropic hydrogels, our development of a reversible binding system based on the thiol–thioester exchange reaction, and an investigation into potential roles for potassium ions in chemistry pertinent to the origin of life.

### **New York University, 1/1999–8/2002**

#### **Department of Chemistry, Advisor: Prof. David I. Schuster**

As a Samuel F.B. Morse Scholar, Arnold and Mabel Beckman Scholar, and U.S. Office of Naval Research Scholar in the laboratory of Professor David I. Schuster, I studied organic synthesis, photochemistry, and photoinduced electron transfer. We 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–C<sub>60</sub> hybrid, was the earliest example of a copper hybrid in this field. The second, a concatenated porphyrin–fullerene dyad, was one of the few examples of a hybrid with a non-covalent linkage between the donor and acceptor chromophores.

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

#### **Chemical Analysis Laboratory, Advisor: Dr. John Liebermann, Jr.**

As a high school student in the laboratory of Dr. John Liebermann, I studied interfacial chemistry and the hydrophobic effect. We examined the effects of varying the organic counteranion of a cationic surfactant to control its critical micelle concentration. The project won awards in the 57<sup>th</sup> annual Westinghouse/Intel Science Talent Search (finalist), Virginia Science Talent Search (grand prize), and the 49<sup>th</sup> annual International Science and Engineering Fair (first prize, chemistry, 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

## RESEARCH ACCOMPLISHMENTS

### Publications

10. Bracher, P.J.; Gupta, M.; Whitesides, G.M. "Paper as a Template for the Delivery of Reactants in the Fabrication of Planar Materials." *Soft Matter* **2010**, published online, DOI: 10.1039/c0sm00031k.
9. Bracher, P.J.; Gupta, M.; Whitesides, G.M. "Patterning Precipitates of Reactions in Paper." *J. Mater. Chem.* **2010**, *20*, 5117–5122.
8. Bracher, P.J.; Gupta, M.; Mack, E.T.; Whitesides, G.M. "Heterogeneous Films of Ionotropic Hydrogels Fabricated From Delivery Templates of Patterned Paper." *ACS Appl. Mater. Interfaces* **2009**, *1*, 1807–1812.
7. Bracher, P.J.; Gupta, M.; Whitesides, G.M. "Shaped Films of Ionotropic Hydrogels Fabricated Using Templates of Patterned Paper." *Adv. Mater.* **2009**, *21*, 445–450.
6. Dickey, M.D.; Lipomi, D.J.; Bracher, P.J.; Whitesides, G.M. "Electrically Addressable Parallel Nanowires with 30 nm Spacing from Micromolding and Nanoskiving." *Nano Lett.* **2008**, *8*, 4568–4573.
5. 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.
4. 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.
3. 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.
2. 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–C<sub>60</sub> Hybrid." *J. Phys. Chem. A* **2003**, *107*, 3215–3221.
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.

### Patents

1. Whitesides, G.M.; Gupta, M.; Bracher, P.J.; Rozkiewicz, D.; Wong, A.; Mack, E. "Shaped Films of Hydrogels Fabricated Using Templates of Patterned Paper," PCT Int. Appl. WO **2009/121038 A2**.

### Invited Lectures

4. **Fieser Student Lecture, Harvard University, Cambridge, Massachusetts, 5/12/2009**  
"Chemistry and the Origin of Life: Possible Roles for Sodium, Potassium, and Thioesters"
3. **Harvard Nanoscale Science and Engineering Center Research Exchange Seminar, Cambridge, Massachusetts, 4/30/2008**  
"The Chemical Landscape of the Prebiotic Earth and Two Specific Problems Regarding the Origin of Life"
2. **ACS Presidential Event Celebrating Ten Years of Beckman Scholars in Chemistry, New Orleans, 4/7/2008**  
"Solutions of Deliquescent Potassium Salts as Protocellular Compartments"
1. **David I. Schuster's 70<sup>th</sup> Birthday Symposium, New York University, New York City, 6/3/2005**  
"High Affinity Reversible Binders Compatible with Biology"

### Meeting/Conference Presentations (Oral)

5. **238<sup>th</sup> National Meeting of the American Chemical Society, Washington, DC, 8/19/2009**  
"Films of Metal Cross-linked Ionotropic Hydrogels: Fabrication and Applications"
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. **197<sup>th</sup> 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<sup>+</sup>"

### **Meeting/Conference Presentations (Poster)**

4. **238<sup>th</sup> National Meeting of the American Chemical Society, Washington, DC, 8/16/2009 and 8/17/2009**  
"Delivery Templates of Patterned Paper for the Fabrication of Flat and Curved Planar Materials"
3. **Radcliffe Institute Science Symposium: Origins of Life, Cambridge, Massachusetts, 3/7/2008**  
"Solutions of Deliquescent Salts as Proto-cellular Compartments"
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"