

Diane L. Schaak, PhD

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Scientific Positions

Senior Scientist (2006-current)

Rowland Institute at Harvard University
Cambridge, MA

I am a senior scientific advisor to the Junior and Senior Fellows currently at the Rowland Institute in both an advisory and experimental capacity. These interactions often involve the conceptualization of the design and the execution of experimental research projects to test proof of principle concepts, usually implementing biophysical and biological techniques.

I also continue interacting with junior fellows no longer on site, campus facility and collaborating scientists throughout the world.

One of my major goals as a scientific advisor / leader is to, not only originate and implement novel experimental projects, but to teach and guide scientists not experienced in laboratory methodologies to become accomplished laboratory experimentalists.

In conjunction with my senior scientist role, I am currently the on site Chemical/ Laboratory Safety Officer at the Rowland. This task includes educating and guiding new, and resident, personnel in on site safety protocols. Naturally this includes being the 'go-to' person with any questions or issues that arise re:laboratory safety.

Principal Founder

6/2002 – 6/2006

MicroStealth Technologies Corporation
Beverly, MA

I formed MicroStealth Technologies to continue the research and development of my patented toxin-phage bacteriocide as a therapeutic agent, a Trojan horse that would inject a lethal peptide into antibiotic-resistant bacteria. I have been involved not only in the science but also in the business aspects and (alas) the quest for funding.

Principal Investigator

6/2000 - 1/2003

Rowland Institute at Harvard
Cambridge, MA

I was awarded a two-year grant to experimentally investigate the medical potential of an idea I had had for a bacteriophage-based bacteriocide. I genetically altered a phage to deliver into bacteria a peptide of the kind I had developed during my postdoctoral fellowship. I had to develop new methods to create and genetically assay such modified phages. These altered phages successfully targeted and eliminated both Gram-positive and Gram-negative bacteria both *in vitro* and *in vivo*. The toxin-phage combination proved lethal to bacteria once the peptide was

inside them yet benign extracellularly in all cell and animal models tested. This work resulted in a patent (US #6,759,229), on which I am the sole inventor.

Postdoctoral Fellow

7/1997 - 5/2000

Rowland Institute for Science

Cambridge, MA

I designed large peptides to hypothetically fold into structural motifs commonly found in proteins. I then generated, by peptide synthesis or biological expression systems, several of the peptides that had computationally folded into a desired structure, purified them, and characterized their secondary and tertiary structures using biophysical techniques including CD and NMR. Several of these proteins displayed intriguing biological properties.

Education

PhD with emphasis in protein folding biophysics.

Biology Department, University at Albany, SUNY 1998.

Scientific Skills

- **Expert in designing novel experiments to test proof of principle goals**
- **Expert in 'hands on' experimental methods in fields of:**
 - Biophysics
 - Biochemistry
 - Molecular Biology (both eukaryotic and prokaryotic cell types)
 - Spectroscopies
 - Microscopies

Leadership & Personal Skills

- Adept at decision-making and working in both structured environments and unstructured, rapidly changing circumstances.
- Experienced working within a team, as well as working completely independently.
- Managerial experience.
- Experienced in the business and intellectual-property aspects of biotechnology as well as the technical.
- Experienced public speaker for both scientific professionals and lay audiences.

Selected Publications

E. Schonbrun, G Di Caprio and D. Schaak, "Dye exclusion cell volumetric imaging," *Opt. Exp.*, **21**, 8793-8798 (2013).

Gorthi SS, Schaak D, Schonbrun E. **Fluorescence imaging of flowing cells using a temporally coded excitation.** *Opt Express* 2013; 21(4):5164-70.

G. Di Caprio, D. Schaak and E. Schonbrun, "Hyperspectral fluorescence microfluidic microscopy," *Biomed. Opt. Exp.*, 4, 1486-1493 (2013). 28.

- Schonbrun E, Gorthi SS, Schaak D. **Microfabricated multiple field of view imaging flow cytometry**. *Lab Chip* 2012;12(2):268-73
- K. Halvorsen, D. Schaak, and W.P. Wong, (2011), Nanoengineering a single-molecule mechanical switch using DNA self-assembly, *Nanotechnology* 22 (49):494005 (2011)
- Schaak, DL (2004). Toxin-Phage Bacteriocide Antibiotic and Uses Thereof. US Patent #6,759,229 B2; July 6, 2004.
- Schaak, DL (1998). Development and Characterization of a Peptide Model System to Study Omega Loops. PhD dissertation. University at Albany, SUNY.
- Fetrow, JS; Dreher, U; Wiland, DJ; Schaak, DL; & Boose, TL (1998). Mutagenesis of histidine 26 demonstrates the importance of loop-loop and loop-protein interactions for the function of iso-1-cytochrome c. *Protein Science* 7(4):994-1005; April 1998.
- Fetrow, JS; Horner, SR; Oehrl, W; Schaak, DL; Boose, TL; & Burton, RE (1997). Analysis of the structure and stability of omega loop A replacements in yeast iso-1-cytochrome c. *Protein Science* 6(1):197-210; January 1997.

References

Furnished upon request.