Introducing our AUTHORS

Image courtesy of Abhijit Banerjee.

Abhijit Banerjee

Education: Presidency College, Calcutta, India, B.Sc. in chemistry (Honors), May 2000; Indian Institute of Technology, Bombay, India, M.Sc. in biotechnology, June 2002, Advisor, Late Professor Anil K. Lala; Project Staff, June 2003, Advisor, Professor Dulal Panda; Binghamton University (SUNY), Ph.D. in chemistry, May 2010, Advisor, Professor Susan Bane

Nonscientific interests: Music, astrology, movies, sports

My research aims to study the function of C-terminal of tubulin during polymerization. I have been currently working to develop tools suitable for studying the conformation of the C-termini of tubulin during tubulin polymerization *in vitro* and in live cells. Although it is well-known that the C-termini play an important role during tubulin polymerization and in regulating the drug binding ability of tubulin, how the C-terminal regions are involved in these processes is not known because of the lack of structural information about the C-terminal tail. As demonstrated in this article I have utilized bioorthogonal labeling techniques to label the C-terminus of α-tubulin in a site-specific manner. In this article we have revealed that the *in vitro* site-specific labeling of tubulin can be employed to label the live cells. My colleagues are currently working on improving upon the resolution of the labeling technique to observe well-defined microtubules in live cells. (Read Banerjee's article, DOI: 10.1021/cb100060v)

Image Courtesy of Danny Hung-Chieh Chou.

Danny Hung-Chieh Chou

Current position: Harvard University, Department of Chemistry and Chemical Biology, Ph.D. candidate in Prof. Stuart Schreiber's lab

Education: National Taiwan University, B.S. in Chemistry, 2006

Nonscientific interests: a big fan of baseball and karaoke

My research focuses on using a chemical approach, especially organic synthesis, to tackle human diseases. My interest in organic synthesis began during my undergraduate research in Prof. Ken-Tsung Wong's lab in NTU. After I came to Harvard in 2007, I joined Prof. Stuart Schreiber's lab to develop high-throughput cellular assays to study the biology of pancreatic beta cells. In particular, I am interested in discovering small molecules that could prevent beta-cell apoptosis induced by inflammatory cytokines in type 1 diabetic models. I had finished a large-scale chemical screen in discovering suppressors of beta-cell apoptosis induced by cytokines. I synthesize analogues of "hits" found in the screen in order to obtain better cellular potencies. (Read Chou's article, DOI: 10.1021/cb100129d)

Image courtesy of James Cronican.

James Cronican

Current position: Harvard University, Department of Chemistry, Ph.D. candidate with Prof. David R. Liu

Education: Arizona State University, B.S. in biochemistry, 2007

Nonscientific interests: sports, hiking, learning to sail

I am interested in protein surfaces and in manipulating protein surfaces for addressing biotechnology applications. Resurfacing proteins for cell penetration and macromolecule delivery is one such application. Here we show that green fluorescent protein (GFP), mutated at solvent-exposed residues to yield a +36 GFP, is able to deliver three different cargo proteins into a variety of mammalian cell lines. We show that +36 GFP outperforms some of the most popular cell-penetrating peptides in terms of both internalization and functional delivery. We hope this work may enable researchers to harness the increased potency and efficiency of +36 GFP-mediated protein delivery for their own research aims. I'm anxious to pursue further macromolecule delivery applications *in vitro* and *in vivo* and to investigate how protein surfaces may be utilized for similar functions in nature. (Read Cronican's article, DOI: 10.1021/cb1001153)

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Image courtesy of Boris Fuertig.

Boris Fuertig

Current position: Max F. Perutz Laboratories Vienna, Postdoctoral Researcher with Prof. Renée Schroeder
Education: Goethe University Frankfurt, Diploma in biochemistry 2003; Goethe University Frankfurt, Department of Organic Chemistry and Chemical Biology, Ph.D. in biochemistry with Prof. Harald Schwalbe
Nonscientific interests: playing clarinet, squash, and knitting

Since my diploma thesis I have been working in the field of RNA folding and dynamics. As technique of choice I utilize NMR spectroscopy, with an emphasis on laser-triggered real-time experiments. This approach is great fun since it couples NMR spectroscopy, photolabile compounds, and laser spectroscopy such that folding can be initiated at ultimate speed and under folding conditions. I am very much fascinated by the fact that RNA sequences can adopt several functional conformations in contrast to other biomolecules and that one functional fold can be maintained by several different sequences. In the current study we analyzed the effect of small biological active molecules on the folding transition of a bistable RNA molecule. By means of a statistical analysis of the distribution of elementary kinetic rates we could decipher a model of a compact transition state. The folding landscape of RNAs is fundamentally different to the landscape of proteins. Different groundstates of nearly equal stability are separated by enormous energy barriers that clearly correlate with the number of base pairs present. Cosolvents such as ions help to lower these barriers to allow RNA refolding. Later, RNA chaperone may have evolved that accelerate RNA folding transitions. (Read Fuertig's article, DOI: 10.1021/cb100025a)

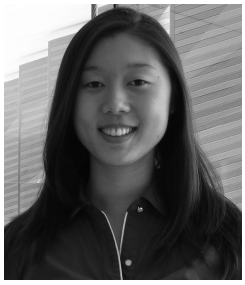

Image courtesy of Yun Kyung Kwon.

Yun Kyung Kwon

Current position: Princeton University, Lewis-Sigler Institute for Integrative Genomics and Department of Chemistry, Ph.D. candidate with Prof. Joshua D. Rabinowitz (completed in September 2010)
Education: Lebanon Valley College, B.S. in chemistry with Prof. Owen A. Moe, 2005
Nonscientific interests: SCUBA diving, rock climbing, piano, flute, tennis

My graduate work focused on applying mass spectrometry based metabolomics to holistically understand drug action. We developed a method to detect the full spectrum of intracellular folates using liquid chromatography-tandem mass spectrometry (LC-MS/MS). Using this technology, I discovered that the antifolate drug trimethoprim leads to blockade not only of the target enzyme DHFR but also of another critical enzyme in folate metabolism; this work was featured on the cover of *Nature Chemical Biology*. In my current paper, I examine the overall effects of trimethoprim on *E. coli* metabolism and the downstream consequences. After completing my Ph.D., I will pursue postdoctoral work in cancer metabolism with Prof. Matthew G. Vander Heiden in the Koch Institute for Integrative Cancer Research at Massachusetts Institute of Technology. (Read Kwon's article, DOI: 10.1021/cb100096f)

Image courtesy of David Thompson.

David Thompson

Current position: Harvard University, Department of Chemistry and Chemical Biology, Ph.D. student with Prof. David Liu
Education: Michigan State University, B.S. in microbiology, 2006
Nonscientific interests: zombie movies, dinosaurs, wandering, Sculpey

My scientific interests are roughly at the intersection of protein engineering, systems engineering, and functional genomics as applied to problems of gene and molecular therapy. Currently, my research is focused on the use of protein engineering and evolution techniques to overcome barriers to macromolecular delivery in mammalian cells. On paper, the ability to deliver arbitrary proteins of interest into cells is a powerful research and therapeutic tool. In practice, however, though a variety of protein delivery techniques exist, none enjoy widespread use due in large part to low potency. Our research demonstrates the use of engineered "supercharged" proteins to achieve much more efficient delivery. We think that the greater potency of such proteins could lead to wider use of protein delivery as a biological tool. (Read Thompson's article, DOI: 10.1021/cb1001153)