acs chemical biology

Introducing our AUTHORS

Sarah L. Veatch

Image courtesy of Norah Smith.

Current position: Cornell University, Department of Chemistry and Chemical Biology, Postdoctoral Researcher with Barbara Baird
Education: Massachusetts Institute of Technology, B.S. in physics, 1998; University of Washington, Ph.D. in physics with Sarah Keller, 2004; University of British Columbia, Department of Microbiology and Immunology, Postdoctoral Researcher with Robert Hancock, 2005–2006
Nonscientific interests: Rugby, home improvement, playing with my dogs

My research is aimed at deciphering how the physical properties of lipids and lipid mixtures contribute to biological functions. This interest arises from past work in model membranes, where I found that observations of large (>1 μm) liquid domains and small (<1 μm) critical fluctuations can be understood from fundamental thermodynamic principles. In this paper, I demonstrate that vesicles isolated in the plasma membranes of living cells have critical compositions. It is exciting to speculate that cells utilize the unique properties of critical systems, and that critical fluctuations provide the physical basis for functional compartmentalization in living cells (*e.g.*, lipid rafts). (Read Veatch's article on p 287 and Point of View on p 265.)

Thomas J. Baiga

Image courtesy of Thomas J. Baiga.

Current position: Salk Institute for Biological Studies, Chemical Biology and Proteomics Laboratory, Staff Chemist with Prof. Joseph P. Noel, 2004–present
Education: Rensselaer Polytechnic Institute, B.S. in chemistry, 1991; University of California, San Diego, M.S. in organic chemistry, 1994
Industrial work: Ontogen Corporation, Exploratory Chemistry Group with Dr. Adnan M. M. Mjalli, 1994–1996; Charybdis Technologies, co-founder, 1996–2001
Nonscientific interests: Horseback riding, hiking, high-power rocketry

My research here at the Salk focuses on leveraging the creativity, power, and elegance of synthetic organic chemistry and employing it to address interesting biological questions. The synergism achieved by effectively integrating chemical and biological disciplines can be quite profound, as demonstrated by this paper. In addition to the development of novel and innovative chemical tools for forward and reverse chemical genetics, my work spans combinatorial library design and synthesis, rational drug design, development of new multicomponent reactions and methodologies, and high-throughput and high-content screening of small molecules for biological function. (Read Baiga's article on p 294.)

Haibing Guo

Image courtesy of Wuming Yan.

Current position: West Virginia University, Department of Chemistry, Ph.D. candidate in organic chemistry with Prof. George O'Doherty (completed in May 2008)
Education: Hubei Normal University, B.S. in chemistry education, 2000; Shanghai Normal University, M.S. in physical chemistry with Prof. Hexing Li, 2003
Nonscientific interests: Music, socializing with friends, sports

My research interests have been focused on the *de novo* asymmetric synthesis of biologically active natural products *via* palladium-catalyzed reactions. Specifically, I have been looking to use our palladium-catalyzed glycosylation methodology for the synthesis of several different natural products as well as analogs for further biological investigations. These targets include the anticancer indolizidine natural product swainsonine as well as the *Caenorhabditis elegans* pheromone daumone, which is central to this current study. More recently, I have extended our *de novo* approach to the synthesis of more complex targets, like a unique tetrasaccharide-associated anthrax tetrasaccharide. Just like this daumone story, our synthesis of the anthrax tetrasaccharide has provided material to a team of collaborators who are currently using these products to try to develop an anthrax detector as well as a vaccine for the disease. After finishing my Ph.D., I will pursue my postdoctoral study under the guidance of Prof. Yoshito Kishi in the Department of Chemistry at Harvard University. (Read Guo's article on p 294.)

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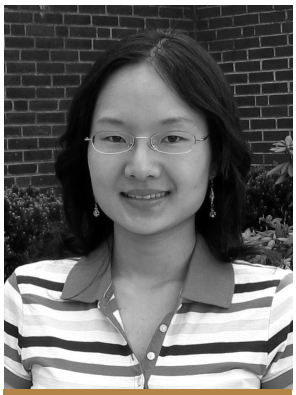


Yalan Xing

Image courtesy of Wuming Yan.

Current position: West Virginia University, Department of Chemistry, Ph.D. student with Prof. George O'Doherty
Education: Beijing University of Chemical Technology, China, B.S. in chemistry, 2006
Nonscientific interests: Music, movies, cooking, sports

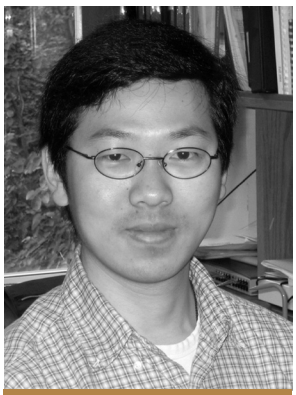
My research interest in organic synthesis began during my undergraduate studies in China. I was attracted by the art and logic of organic synthesis. My specific interest is total synthesis of biologically active natural products. In particular, I like using asymmetric catalysis to install the stereochemistry in these complex structures. We call this approach *de novo* asymmetric synthesis. While the synthesis by itself interests me, it is more exciting when the products have interesting biological activity and potential pharmaceutical applications. As a Ph.D. student in Dr. O'Doherty's group, I am working toward the *de novo* synthesis of biologically active natural products. In this work, we report the total synthesis of fluorescent analogs of daumone, which enabled this *C. elegans* study. (Read Xing's article on p 294.)

Michael B. Austin

Image courtesy of Wendy Austin.

Current position: The Salk Institute for Biological Studies, The Jack Skirball Center for Chemical Biology and Proteomics, Postdoctoral Fellow with Prof. Joseph P. Noel
Education: Missouri State University, B.S. in chemistry, 1998; University of California, San Diego, Ph.D. in chemistry with Prof. Joseph P. Noel, 2005
Nonscientific interests: Aspiring to reason in thought and public discourse while embracing earnest artistic expression, however trivial. I also like cooking.

My graduate work focused on mechanistic principles governing the extensive evolutionary biosynthetic diversification of polyketide cyclization, including the structural "aldol switch" leading to resveratrol biosynthesis. These studies yielded an improved general model, where enzymes and reactive polyketide intermediates cooperatively "negotiate" mechanistic decision trees to determine cyclization fate. These "biosynthetic tangos" between substrates and evolving enzymes constitute a broader theoretical concept relevant to divergent cyclizations of other repetitive oligomeric substrates such as polyisoprenoids. Tangential postdoctoral projects in the Noel lab allowed further investigation of my genome-mining discovery of novel "steely" hybrid fusion enzymes, which orchestrate cellular differentiation in social amoebae. (Read Austin's article on p 294.)



Peng Xie

Image courtesy of Dr. Ronen Marmorstein.

Current position: University of Pennsylvania, Department of Chemistry, The Wistar Institute, Ph.D. candidate with Prof. Ronen Marmorstein
Education: Wuhan University, Wuhan, China, B.S. in chemistry, 2002
Nonscientific interests: Music, history, traveling, badminton

Because the lipid kinase phosphatidyl-inositol-3-kinase (PI3K) has stimulated activity in many cancers, the development of PI3K-specific inhibitors holds great promise for the development of therapeutic agents with broad applications for cancer treatment. Although potent PI3K inhibitors have been previously described, they suffer from a high degree of cross-reactivity with other protein kinases. In my study, I exploit the tools of X-ray crystallography, small-molecule screening, biochemistry, and synthetic chemistry to identify a molecular switch controlling PI3K inhibitor specificity using a novel organoruthenium inhibitor molecular scaffold. Together, these studies provide new molecular details about inhibitor specificity for PI3K and also point to new directions to develop isoform-specific PI3K inhibitors for targeted cancer therapy. (Read Xie's article on p 305.)