Introducing our AUTHORS

Peter F. Slivka

Image courtesy of Yi Li.

Current position: University of Colorado, Department of Chemistry and Biochemistry, Ph.D. student with Prof. Hang (Hubert) Yin
Education: Moravian College, B.S. in biochemistry, 2007
Nonscientific interests: Running, baking, reading science fiction

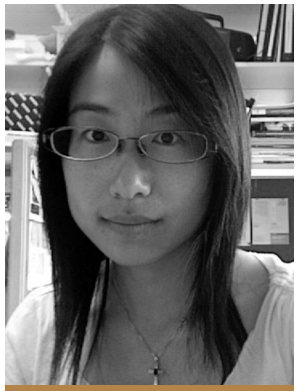
Protein transmembrane domains are emerging as targets for clinical therapeutics and diagnostic tools. Chemical biologists have studied transmembrane domains in a variety of biological systems, and the fruits of their labors are beginning to surface in the form of rational and high-throughput design methods. Peptides which recognize protein transmembrane domains have allowed scientists to deliberately disassemble and study oligomeric receptors such as T-cell and growth factor receptors. Novel technologies that lead to specific transmembrane peptide probes have been reviewed in this article. (Read Slivka's article on p 402.)

Kimberly Matulef

Image courtesy of Chris McLain.

Current position: Stanford University, Department of Molecular and Cellular Physiology, Postdoctoral Fellow with Prof. Merritt Maduke
Education: Brandeis University, B.A./M.S. in biochemistry, with Prof. Andrew Szent-Gyorgyi, 1996; University of Washington, Ph.D. in molecular and cellular biology with Dr. William N. Zagotta, 2002
Nonscientific interests: Hiking, biking, traveling

CLC chloride-transport proteins play many critical physiological roles, yet our understanding of these proteins has been limited by a lack of high-affinity inhibitors. This work describes the discovery of novel inhibitors derived from DIDS, a common low-affinity inhibitor of many anion-transport proteins. We found that the hydrolysis of DIDS results in polythiourea products that inhibit three different CLC proteins more effectively than DIDS itself. These new inhibitors are the most potent CLC inhibitors yet known and will serve as probes for dissecting the molecular mechanisms of chloride transport and as lead compounds for treating disease. (Read Matulef's article on p 419 and Point of View on p 399.)



Yanqiu Yuan

Image courtesy of Yanqiu Yuan.

Current position: Harvard University, Department of Chemistry and Chemical Biology, Ph.D. student with Prof. Suzanne Walker
Education: University of Science and Technology of China, B.S. in chemistry, 2003; Harvard University, Ph.D. in chemistry and chemical biology, 2008
Nonscientific interests: Reading, traveling, daydreaming

Resistance to existing antibiotics and a dearth of novel antibiotics has become a serious threat to public health. My research interest has been focused on understanding a potential antibiotic target, the peptidoglycan glycosyltransferases (PGTs) involved in bacterial cell wall biosynthesis, using biochemical and structural approaches. I am also studying the inhibition of the PGTs by a natural product moenomycin A. A co-complex structure of an analog of moenomycin A bound to a PGT reveals that a network of polar contacts anchoring the inhibitor in the active site of the enzyme involves residues that are conserved among PGTs. I also show that an analog that has potential to satisfy these contacts is biologically active. Thus, the work provides structural insight into moenomycin inhibition and may direct the design of novel antibiotics targeted at PGTs. (Read Yuan's article on p 429.)

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Shinichiro Fuse

Image courtesy of Shinichiro Fuse.

Current position: Tokyo Institute of Technology, Department of Applied Chemistry, Graduate School of Science and Engineering, Assistant Professor
Education: Tokyo Institute of Technology, B.S. in chemical engineering, 2000; Tokyo Institute of Technology, Ph.D. in applied chemistry with Prof. Takashi Takahashi, 2005; Harvard University, Department of Chemistry and Chemical Biology, Postdoctoral Researcher with Prof. Daniel E. Kahne, 2006–2008
Nonscientific interests: Casual strolling, socializing with friends, cooking

For my Ph.D. work, I achieved formal total synthesis of Taxol, a highly complex anticancer drug, by utilizing an automated synthesizer in the Takahashi lab. I was beginning to be interested in how bioactive small molecules interact with target proteins. After moving to the Kahne lab, I became involved in the moenomycin project. Moenomycin is a highly potent natural product antibiotic. In this work, I prepared chemically modified moenomycin analogs to examine protein–ligand contacts in detail. We hope our study will facilitate the design of new antibiotics that target peptidoglycan glycosyltransferases. (Read Fuse's article on p 429.)

Leo L. Chan

Image courtesy of Meng Lv.

Current position: University of Illinois at Urbana–Champaign, Micro and Nanotechnology Laboratory, Nano Sensors Group, Ph.D. candidate with Prof. Brian T. Cunningham
Education: University of Illinois at Urbana–Champaign, B.A. in electrical engineering and bioengineering, 2004; University of Illinois at Urbana–Champaign, M.A in electrical engineering, 2006
Nonscientific interests: Musical performance and composition, ballroom and night club dance, web site development, languages, basketball

Photonic crystal biosensors have recently been developed by incorporating photonic crystal structures into standardized microplates. The sensors have shown high sensitivity in detection of protein–protein, DNA–protein, protein–small molecule, and cellular interactions. Through the use of the biosensors, we were able to detect interactions between apoptosis inducing factor (AIF) and DNA and also detect the disruption of their interaction by introducing a known inhibitor, aurintricarboxylic acid. In this paper, we have developed a high-throughput screening method that was able to quickly and efficiently search for potential inhibitors for DNA–AIF interaction, which will be applied to a library of 200,000 compounds. (Read Chan's article on p 437.)

James T. Heeres

Image courtesy of Nora Wang.

Current position: University of Illinois at Urbana–Champaign, Department of Biochemistry, Ph.D. candidate with Prof. Paul Hergenrother
Education: University of Maryland, B.S. in biochemistry, 2004
Nonscientific interests: Music, guitar, poker

My research is focused on identifying inhibitors of apoptosis inducing factor (AIF). AIF is a cytotoxic DNA-binding protein involved in caspase-dependent and -independent modes of cell death. AIF has been shown to be a relevant death effector in models of Parkinson's disease and stroke/ischemia. In progressing toward inhibitors of AIF, I entered into a collaboration with the lab of Prof. Brian T. Cunningham at Illinois, where we use photonic crystal biosensors to detect AIF–DNA binding or a lack thereof. In the future, we hope to apply this technology to the disruption of protein–protein and protein–RNA interactions. (Read Heeres's article on p 437.)