Introducing our AUTHORS

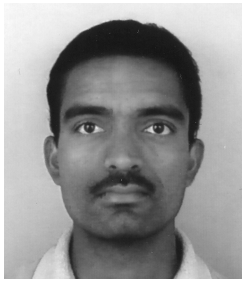

Image courtesy of Sambashiva Banala.

Sambashiva Banala

Current position: École Polytechnique Fédérale de Lausanne Institute of chemical sciences and engineering, final year Ph.D. student with Prof. Kai Johnsson
Education: Indian Institute of Technology, Roorkee, India, M.Sc. in chemistry, 2004
Nonscientific interests: Reading, movies, music, traveling

My research work in Prof. Johnsson's laboratory is focused on the development of photoactivatable probes for protein labeling. Specifically, I synthesized a variety of photoactivatable fluorophores for the labeling of SNAP-tag fusion proteins. Labeling of proteins with chemical probes in living cells is an important method to investigate and manipulate protein function. A fluorescent probe allows visualizing labeled proteins in living cells noninvasively. Photoactivatable fluorophores further improve the visualization of proteins with spatiotemporal resolution because light irradiation can easily be controlled. In this paper, two photoactivatable fluorescent probes and a photoconvertible fluorescent probe were presented. We showed that these probes are useful tools for studying protein dynamics and are potential tools for other applications. (Read Banala's article, DOI: 10.1021/cb1000229)

Image courtesy of Susan Orwig.

J. Nicole Burns

Current position: Georgia Institute of Technology, Department of Chemistry and Biochemistry, Ph.D. graduate student with Dr. Raquel Lieberman
Education: Berry College, B.S. in biochemistry, 2008
Nonscientific interests: Reading, playing video games, watching Japanese anime

I am interested in studying aspects of a disease on a basic level and relating this knowledge to the overall illness. In our paper, we are studying myocilin, which is linked to an inherited form of glaucoma. We created a truncated version of the myocilin, where 90% of reported mutations occur, and studied the wild-type and four mutants' thermal stability. Also we studied the effect of osmolytes on the thermal stability of the wild-type and mutants and found certain compounds could improve mutant stability to or beyond wild-type stability. This study is the first step in developing a high-throughput assay to screen small molecules to stabilize myocilin. If myocilin could be stabilized, it could then be secreted from trabecular meshwork cells and function correctly, alleviating symptoms leading to glaucoma. (Read Burns' article, DOI: 10.1021/cb900282e)

Image courtesy of Julia Harris.

Julia Harris

Education: Capital University, B.A. in biology, minor in chemistry, May 2010; accepted an offer to join The Ohio State Integrated Biomedical Science Graduate Program in the fall of 2010
Nonscientific interests: Running, horseback riding, playing with my dog, and reading

This was my first experience in a graduate level lab as a summer NSF REU student. Coming in to the program I was unsure of what to expect but quickly found the research in the Lieberman lab to be creative and engaging. The development of the fluorescent-based thermal stability assay was the main focus of my time spent at Georgia Tech. Working with the other graduate students, I manipulated a qRT-PCR instrument to fit the needs of our experiment. After working out controls, we were able to test myocilin and its mutants. My time spent in the Lieberman lab helped to cement my decision to pursue a career in biomedical research. (Read Harris' article, DOI: 10.1021/cb900282e)

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Image courtesy of Mark Hedglin.

Mark Hedglin

Current position: University of Michigan, Department of Biological Chemistry, Ph.D. candidate in chemical biology with Asst. Prof. Patrick J. O'Brien
Education: Ithaca College, B.A. in biochemistry, 2001
Nonscientific interests: Cooking, playing guitar, writing music, Rock 'n Roll history, playing with my dog, watching college football

The base excision repair (BER) pathway is responsible for the repair of small chemical modifications to nucleobases. These base lesions are extremely rare and estimated to occur in only 1 of every 1.2 million nucleotides in a typical human cell per day. The daunting task of locating single base lesions among the vast excess of undamaged DNA and initiating the BER pathway is bestowed upon numerous DNA glycosylases, which catalyze the removal of a wide variety of damaged nucleobases from DNA. My thesis research has focused on elucidating the mechanism by which DNA glycosylases overcome the obstacles of a genome-wide search to locate rare sites of DNA damage. Through chemical and biochemical approaches, we have shown that human alkyladenine DNA glycosylase (AAG) utilizes a processive searching mechanism that includes hopping events which allow AAG to simultaneously search both strands of a DNA duplex per binding encounter and bypass tightly bound DNA-binding proteins. (Read Hedglin's article, DOI: 10.1021/cb1000185)

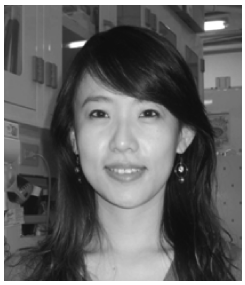

Image courtesy of Chun-Hung Lin.

Ching-Wen Ho

Current position: Chemical Biology and Molecular Biophysics, Taiwan International Graduate Program, Academia Sinica, and National Tsing-Hua University, Ph.D. candidate with Prof. Chun-Hung Lin, April 2010
Education: National Central University, B.S. in chemical engineering, 2001; National Chiao-Tung University, M.S. in applied chemistry, 2003
Nonscientific interests: Tennis, music, movies, and cooking

My research here at Academia Sinica Taiwan focuses on carbohydrate-related enzymes (especially glycosidases) and their associated diseases. The interest arises from past work to establish a rapid screening by diversity-oriented synthesis and subsequent activity assay. In this paper, my work spans rational inhibitor design and synthesis, combinatorial synthesis, computational modeling, and development of cell-based assays, leading to the discovery of potent inhibitors of hexosaminidase (Hex). The best one had a K_i of 0.69 nM against human Hex B and showed 250,000 times more selection for Hex B than for a similar enzyme O-GlcNAcase. The inhibitors were shown to increase the desired glycolipid levels in cultured cells, indicating a promise for therapeutic development. (Read Ho's article, DOI: 10.1021/cb100011u)

Image courtesy of Jae Jung Lee.

Jae Jung Lee

Current position: Singapore Bioimaging Consortium (SBIC), Agency for Science Technology & Research (A*STAR), Laboratory of bioimaging probe development, Postdoctoral research fellow with Prof. Chang Young-Tae, 2008-present
Education: Yonsei University, B.S. in food engineering 1994 and M.S. in biotechnology 1996; Seoul National University, Ph.D. in tumor biology with Prof. Heo Dae Seog, 2007; Seoul National University Hospital, Cancer Research Institute, Postdoc, 2007–2008
Nonscientific interests: Swimming with kids, bible talk, reading books

My current research interest is biological application of fluorescent chemicals. As a molecular biologist, I have been interested in the pathological mechanisms of many diseases such as diabetes, obesity, and cancer. While studying the diseases, I realized the importance of early and accurate diagnosis and was attracted by molecular imaging. Here in SBIC, I desire to develop useful imaging probes to diagnose diverse diseases. Recently, my research focus is the development of chemical protein tagging systems. The study on glutathion *S*-transferase omega 1 in this article inspired me to exploit this protein and dye pair as a tagging tool, and I am very exited to see the performance of our invention in real physiological system. (Read Lee's article, DOI: 10.1021/cb100007s)

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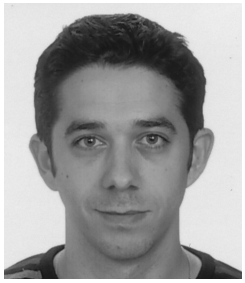

Image courtesy of Damien Maurel.

Damien Maurel

Current position: Swiss Federal Institute of Technology/ Ecole Polytechnique Fédérale de Lausanne, Switzerland, Institute of Chemical Sciences and Engineering, postdoctoral position with Prof. Kai Johnsson
Education: University of Sciences, Montpellier, B.S. in biology, 2000; Université de la Méditerranée, Marseille, M.S. in immunotechnology, 2002; Ph.D. at the Functional Genomic Institute/Institut de Génomique Fonctionnelle with Dr. Jean-Philippe Pin, 2006
Nonscientific interests: Playing piano, composing, spending time with family and friends

During my Ph.D. work with Jean-Philippe Pin in Montpellier, we have developed a time-resolved FRET method to detect G protein-coupled receptor interactions at the cell surface. These receptors constitute one of the most important targets for the pharmaceutical industry, and understanding how they function is crucial for drug development. The key enabling technique in this work was the so-called SNAP-tag labeling approach that was developed in the laboratory of Kai Johnsson. Enthused by this approach, I joined him in Lausanne for my postdoctoral research. In our article, we describe a synthetic strategy for the generation of photosensitive probes that can be covalently coupled to SNAP-tag fusion proteins. The fact that the strategy can be extended to a broad color palette of targetable photosensitive probes should make it generally useful for imaging proteins in cells. (Read Maurel's article, DOI: 10.1021/cb1000229)

Image courtesy of Kathryn Pigg.

Susan Orwig

Current position: Georgia Institute of Technology, Department of Chemistry and Biochemistry, Ph.D. Candidate with Prof. Raquel Lieberman
Education: North Georgia College and State University, B.S. in chemistry with minor in biology, 2006
Nonscientific interests: Going to the park, the arts, exercising, my dogs, tapas, scary movies

I am interested in proteins in which genetically inherited mutations lead to altered protein homeostasis and, ultimately, to disease. In particular, my graduate research efforts have been directed toward structurally characterizing missense mutations in the lysosomal enzyme acid β-glucosidase that result in the most common lipid storage disorder, Gaucher disease. In conjunction, my research also involves the biophysical and structural characterization of the protein myocillin, which forms part of the trabecular extracellular matrix thought to regulate eye pressure. Genetically inherited mutations in myocilin lead to early onset glaucoma, affecting millions of people worldwide. In this study, we have overcome the difficulties in expression and purification of OLF mutants and developed a thermal stability assay providing the first direct evidence that mutant OLF is folded, but less thermally stable. (Read Orwig's article, DOI: 10.1021/cb900282e)

Image courtesy of Eun-Ang Raiber.

Eun-Ang Raiber

Current position: University College London, Department of Chemistry, Postdoctoral Researcher with Alethea Tabor
Education: University of Duesseldorf and University of Nantes, M.Sc. in chemistry, 2004; University of Salford, Ph.D. in organic chemistry with Jim Wilkinson, 2007
Nonscientific interests: Sports, music, traveling

Working in an interdisciplinary research environment during my Ph.D. made me strongly believe that the collaborative approach of chemical biology is essential to tackle scientific challenges in human biology. I therefore was keen to work on the current project that aims to study antigen processing *in vivo* using novel chemical tools. In this paper, we report the synthesis and validation of an inhibitor-carrier conjugate that targets aspartic proteases in antigen presenting cell compartment of the immune system. I have synthesized fluorophore-labeled inhibitor conjugates, which have revealed new and unexpected details of the receptor-mediated endocytosis pathway. (Read Raiber's article, DOI: 10.1021/cb100008p)

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Image courtesy of Junghyun Son.

Junghyun Son

Current position: Laboratory of Bioimaging Probe Development, Singapore Bioimaging Consortium, Biomedical Research Council, Agency for Science, Technology and Research, Staff Scientist with Young-Tae Chang
Education: Yonsei University, B.S. in biotechnology, 1998 and Ph.D. in biotechnology, 2004; Korea Institute of Science and Technology, Postdoctoral Researcher with Dong-Hyun Kim and Man-Ho Choi, 2004–2006; Massachusetts Institute of Technology, Department of Biological Engineering, Postdoctoral Researcher with Peter C. Dedon, 2006–2007
Nonscientific interests: Golf, skiing, watching movies

My research interests focused on the application of mass spectrometry to discover or develop the novel chemicals for incurable diseases. In this paper, I demonstrate that MudPIT is applicable to identify the target or biomarker, which is the bottleneck of chemical genetics, and finally discover a novel fluorescent inhibitor of GSTO1. In addition to the development of innovative tools for chemical genetics and proteomics, I premeditated imaging mass spectrometry, which is a technique to visualize the spatial distribution of compounds, biomarker, metabolites, peptides, or proteins by their molecular masses. (Read Son's article, DOI: 10.1021/cb100007s)