TIMOTHY FENTON

Image courtesy of Karin Higgins

Current position: Staff Research Associate 2 at QB3MacroLab at University of California, Berkeley

Education: B.S. in Cell Biology, University of California, Davis; Advisor: Dr. Marc Facciotti

Nonscientific interests: I am very interested in carbon composite fabrication focused primarily on building road bicycle components. I also enjoy swimming, cycling and playing tennis.

I am interested in addressing foundational problems in the field of synthetic biology that currently constrain our ability to build increasingly complex devices. In my view, our paper highlights how our incomplete understanding of the low-level coding plasticity of DNA can sometimes lead us astray. Closing critical knowledge gaps such as this will ultimately help pave the way for increasingly ambitious synthetic systems. (Read Fenton's article; DOI: 10.1021/sb300114d)

AUNICA KANE

Photo courtesy of Aunica Kane.

Current position: Graduate Student, University of Minnesota; Advisor: Dr. Jeffrey A. Gralnick

Education: Master's in Microbial Engineering, University of Minnesota; Advisor: Dr. Jeffrey A. Gralnick. B.A. in Biology, University of Minnesota; Advisor: Dr. Ronald R. Jemmerson

Nonscientific interests: Anything outdoors; playing with my two dogs; traveling

My graduate lab focuses on the physiology of *Shewanella*. *Shewanella* is an unusual bacterium due to its ability to respire insoluble metals and electrodes—a trait that is important for the geochemical cycling of metals and can be harnessed for electricity production in microbial fuel cells. My Master's work, which is featured in this issue of *ACS Synthetic Biology*, focused on engineering *Shewanella* to bind to electrode surfaces usingsynthetic peptides. This paper provides a novel strategy to specifically immobilize bacteria to electrodes while also outlining challenges involved in merging synthetic biology approaches with native cell pathways. My Ph.D. work is centered on using synthetic biology to combine metabolic pathways in a modular approach leading to the development of self-organized and interactive microbial partnerships using *Shewanella* and *Geobacter*, another metal-reducing bacterium. This engineered community enables us to harness the metabolic capabilities of each species while also providing information on pathways required for electron transport. (Read Kane's article; DOI: 10.1021/sb300042w).

SABRINA KILLE

Image courtesy of Sabrina Kille.

Current position: Postdoctoral Researcher with Prof. Manfred T. Reetz

Education: Ph.D. in Biochemistry, Max-Planck-Institute for Coal Research, Germany, 2010; Advisor: Manfred T. Reetz. Diploma in Chemistry,Philipps-University of Marburg, Germany, 2007

Nonscientific interests: Reading fiction, board games, 3D-modeling art, and spending time with friends

My personal research interests are oxidoreductases (including P450s) with a focus on understanding protein mechanisms on a molecular level and solving questions arising from protein or cell based processes in biocatalysis, utilizing protein engineering concepts. In this respect, we thought that it is not only important to reduce the screening effort of mutant libraries created by saturation mutagenesis but also to stress that nobody should blindly trust the efficient creation of gene diversity via PCR. Personally, I hope that

Received: January 25, 2013
Published: February 15, 2013

the Quick Quality Control becomes a routinely reported control. (Read Kille's article; DOI: 10.1021/sb300037w).

TAKAFUMI MIYAMOTO

Image courtesy of Yu-Chun Lin.

Current position: Postdoctoral fellow, Cell Biology, Johns Hopkins University, School of Medicine; Advisor: Dr. Takanari Inoue

Education: Ph.D. in Medicine, Kobe University; Advisor: Prof. Ushio Kikkawa. B.S. Nutritional Science, Okayama Prefectural University; Advisor: Prof. Yoshio Okada

Nonscientific interests: I enjoy cooking and eating various countries' cuisine, along with sampling their culture.

For many years researchers have strived to create biomolecule-based logic gates for biological computers or to control cellular functions at will. Both nucleic acids and proteins have been applied to generate logic systems that are able to yield defined binary output given a set of inputs. In this paper, we review various biomolecular logic gates that have been established in both test tubes and living cells. These landmarks should shed light on the field of synthetic biology, with the aim of trying to create higher processing speed biocomputers and more advanced biomedical applications. My research is focused on synthesizing fast-processing Boolean logic gates in living cells. Looking forward, I am interested in controlling cellular functions by chemically inducible dimerization systems, where localization of versatile functional proteins is directed by a specific logic circuit. (Read Miyamoto's article; DOI: 10.1021/sb3001112).

KEEGAN OWSLEY

Image courtesy of Keegan Owsley.

Current position: Ph.D. student in Bioengineering at University of California, Los Angeles; Graduate Advisor: Dr. Dino DiCarlo

Education: B.S. in Biomedical Engineering from the University of California, Davis

Nonscientific interests: 3D printing; beating my friends at Starcraft II; Sci-fi and fantasy; card games; theater

The discovery detailed in this paper is an experimental validation of a problem that everyone knew would crop up eventually in synthetic biology: while many biological parts can be approximated as discrete, composable units, the fact is that biology is a lot more messy than we like to admit. Those nice, separate units on paper can actually blend into one another in reality, creating entirely new, unpredicted functions at their interfaces. The surprising part is not that this sort of thing was going to happen, but that it happened so soon, with commonly used parts in perfectly ordinary situations. There's good news, of course; as predictive models improve, so too will our ability to compose these pieces and design newer, more complicated systems. It is the tools of the future, and the lessons that we learn today, that drive our innovation going forward. (Read Owsley's article; DOI: 10.1021/sb300114d)

ANDREW YAO

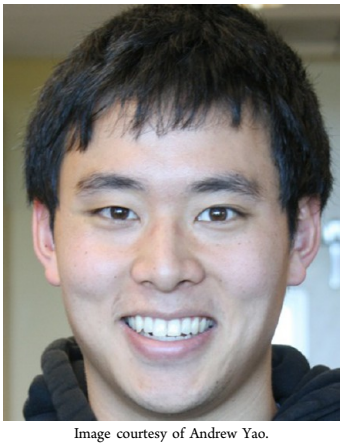

Image courtesy of Andrew Yao.

Current position: Staff Research Associate at the University of California, Davis; Principal Investigator: Dr. Marc T. Facciotti

Education: B.S. in Biomedical Engineering from the University of California, Davis

Nonscientific interests: Playing tennis; watching sports; cooking at my in-law's Chinese restaurant

I have dedicated a large amount of my time mentoring and learning from our university's iGEM teams and have developed an interest in synthetic biology. I plan on obtaining a graduate degree in molecular biology where I would like to study the process of cancer initiation at a systems level, while also continuing to work with the iGEM/SynBio community. Our paper describes the characterization of a new functional element that arose unexpectedly in a device constructed from standardized parts. This was surprising because each of the component parts had been previously characterized. Together, they became more than the sum of their parts. Even though this contradicts the notion that standardized parts are functionally independent, and may complicate how we go about assembling synthetic devices, this also demonstrates that we might be ultimately able to intelligently increase the density of functional elements in our synthetic devices. (Read Yao's article; DOI: 10.1021/sb300114d)

CHUN YOU

Image courtesy of Xiaozhou Zhang.

Current position: Senior Research Associate, Biological Systems Engineering, Virginia Tech, Blacksburg, Virginia; Advisor: Prof. Y.H. Percival Zhang

Education: Ph.D. in Genetics, Fudan University, Shanghai, China; Advisor: Prof. Hong Lu. B.S. Biology, Fudan University, Shanghai, China

Nonscientific interests: Basketball, swimming, fishing

My current research is focused on the cell-free biosystem, which is a high-product-yield and low-cost biomanufacturing platform. We have developed some biological tools for this biosystem and synthetic biology. A general restriction enzyme-free and ligase-free method named Simple Cloning can be used for subcloning one, two or three desired DNA fragments into any location of a vector in one day. This cloning method can be modified to generate a large size mutant library for directed evolution. A synthetic protein scaffold derived from natural cellulosome can be used to assemble, purify and immobilize the enzyme complex, which can facilitate the enzymatic reaction rate, protect labile intermediate, mitigate toxic intermediate inhibition and regulate metabolic fluxes in cell-free systems. Furthermore, I am interested in using other cell-free biosystems to produce some valuable chemicals and fix CO_2 to organic acid. (Read You's article; DOI: 10.1021/sb300068g).

dx.doi.org/10.1021/sb400006v | *ACS Synth. Biol.* 2013, 2, 65−67