SERGEY BOYARSKIY

Stacey Shiigi

Current Position. Graduate student at the UC Berkeley/UCSF Joint Graduate Group in Bioengineering. Advisor: Dr. Danielle Tullman-Ercek.

Education. B.S. Bioengineering at the University of California Los Angeles.

Nonscientific Interests. Hiking, cycling, watching sports.

My research interests focus on learning to manipulate the environment inside cells for better allocation of small molecule resources. Control of metabolites through direct means in addition to indirect expression of the enzymes can lead to major advances in metabolic engineering. In this work we were able to alleviate intracellular toxicity of *n*-butanol by engineering a native *E. coli* membrane protein to secrete the potential biofuel. We were able to not only lower the amount of *n*-butanol remaining inside the cell but also increased the growth of bacteria in an *n*-butanol containing medium. Looking forward, I'd like to advance this work to include other small molecules as well as establishing design criteria for faster evolution of tailored transporters. (Read Boyarskiy's article; DOI: 10.1021/sb400065q).

MICHAEL FISHER

Communications Team at the Synthetic Biology Engineering Research Center

Current Position. STEM Educator with the Liberty Science Center (Liberty State Park, Jersey City, New Jersey)

Education. Postdoctoral Fellow, Energy Biosciences Institute, University of California, Berkeley. Advisor: Dr. Danielle Tullman-Ercek; Ph.D. in Molecular Biology, Princeton University. Advisor: Dr. Michael Hecht; B.S. summa cum laude in Biology (Chemistry minor; completed the college honors program), The College of New Jersey. Advisor: Professor Amanda Norvell.

Nonscientific Interests. I will never tire of cruising over to the beach, looking out over an ocean that is brushed by a calm offshore breeze and teeming with peaky surf, charging out into the breakers, and riding waves with my brother and friends. I also greatly enjoy reading, running, wine tasting, hiking, travel, theology, music, movies, following New York Mets baseball, and spending time with my friends, family, and little cousins.

Using microbes to make fuels and other chemicals promises to enhance the efficiency and sustainability of chemical production processes. Our work provides strong evidence that microbial efflux pumps can be modified to enable the secretion of non-native, industrially relevant substrates, reducing the substrates' intracellular concentrations and enhancing microbial growth rates. The proof-of-principle that we have demonstrated may lead to amplified cell growth, increased product recovery, and enhanced productivity in the context of many microbially mediated chemical production processes. I am very grateful to have worked on a research project as socially relevant as biofuel production with a PI as enthusiastic, insightful, and supportive as Professor Tullman-Ercek, as well as with our creative and hard-working team. From the beginning, Professor Tullman-Ercek encouraged me to explore all of the angles of our project. That led me to become involved in developing and coordinating the Energy Biosciences Institute large-scale interactive outreach exhibit. I became hooked on science outreach and public engagement, and after seeking out as many volunteer opportunities as possible, I am now advancing my career in science outreach with the team at the Liberty Science Center in New Jersey. (Read Fisher's article; DOI: 10.1021/sb400065q).

LÆRKE MÜNTER LASSEN

Anders Lærke Nielsen

Current Position. Postdoctoral fellow, Copenhagen Plant Science Centre, Department of Plant and Environmental Sciences,

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University of Copenhagen, Denmark. Advisor: Prof. Poul Erik Jensen.

Education. Ph.D. in Synthetic Biology, University of Copenhagen, Denmark (2013). Advisors: Prof. Poul Erik Jensen and Prof. Thomas Bjørnholm. M.Sc. in Nanoscience, Bio-Nanotechnology Laboratory, Institute of Neuroscience and Pharmacology and Nano-Science Center, University of Copenhagen, Denmark (2009). Advisor: Associate Professor Karen Martinez.

Nonscientific Interests. Spending time with friends and family, kayaking, climbing, being out in nature, travelling.

My research is focused on the bioengineering of cyanobacteria to utilize the reducing power generated by photosystem I for light-driven production of specialized metabolites. Plants produce large number of different specialized metabolites with interesting properties, and many of these compounds can potentially be used as pharmaceuticals. In my research, I transfer the biosynthesis pathways of plant specialized metabolites to the thylakoids of cyanobacteria and couple them to photosynthetic electron transport and photosynthetic CO_2 fixation for generating the needed carbon backbones. We aim at developing a system for sustainable production of high-value natural compounds. (Read Lassen's review; DOI: 10.1021/sb400136f).

SOLVEJ SIEDLER

Kristen Bräker

Current Position. Postdoctoral Fellow, Novo Nordisk Foundation Center for Biosustainability, Technical University of Denmark. Advisor: Jerome Maury/Ana Rute Neves.

Education. Dr. rer. nat Biology, Forschungszentrum Jülich GmbH/University of Düsseldorf, Germany. Advisor: Prof. Michael Bott; M.S. in Biochemistry, University of Düsseldorf, Germany.

Nonscientific Interests. Cycling, running, ballroom dancing, playing the piano.

My research is focused on development and application of transcription factor based biosensors for detection of small molecules *in vivo*. These biosensors couple the concentration of small molecules to expression of a fluorescent protein. Our study describes the design of an NADPH/NADP+ redox sensor in *Escherichia coli*, which can be applied toward high throughput screening of NADPH dependent enzymes by FACS. An NAPDH specific alcohol dehydrogenase was chosen as an example for optimizing the enzyme activity with the non-natural product 4-methyl-2-pentanone. I believe that biosensors are imperative to minimize the construction time in bacterial cell engineering and in the future I would like to further dedicate my research to work in the field of biosensor development with an application in synthetic biology and metabolic engineering. (Read Siedler's article; DOI: 10.1021/sb400110j).