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Ranjini Prithviraj

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■ OMAR AKBARI

Omar Akbari

Current Position. Senior Postdoctoral Fellow, Division of Biology and Biological Engineering at California Institute of Technology. Advisor: Bruce A. Hay.

Education. PhD, Cellular and Molecular Biology at University of Nevada, Reno. Advisor: Robert A. Drewell. Combined BS/MS in Biotechnology at University of Nevada, Reno. Advisor: Robert A. Drewell.

Nonscientific Interests. I enjoy traveling, exploring new cultures, and everything outdoors—camping, biking, swimming, hiking, cycling.

My research predominantly focuses on the basic genetics and physiology of mosquitoes with the overall goal of developing innovative, novel, creative, synthetic biology inspired genetic control technologies for reducing the burden of mosquito borne vector diseases on humans. The underlying hypothesis inspiring this work is that the introduction and spread of genes that prevent mosquitoes to transmit pathogens should in theory lead to less transmission of these pathogens, resulting in decreases of human infections and/or death. To test this hypothesis, first we need a broad understanding of the biology of the mosquito to develop gene-based strategies for engineering mosquitoes that are resistant to pathogens; second, we need to develop tools to rapidly "drive" these laboratory developed genes into wild mosquito populations. This paper represents a significant step in that second direction, by demonstrating that engineering "gene drive" systems is possible. (Read Akbari's article; DOI: 10.1021/sb300079h).

■ NICHOLE DARINGER

Nichole Daringer

Current Position. Postdoctoral associate, Institute for Medical Engineering and Science, Massachusetts Institute of Technology. Advisor: Dr. Jim Collins.

Education. PhD Chemical and Biological Engineering, Northwestern University (2014). Advisor: Dr. Joshua Leonard. BSE Chemical and Biochemical Engineering, University of Iowa (2008).

Nonscientific Interests. Cycling, hiking, reading, playing the piano.

My doctoral research focused on using synthetic biology as a tool to develop cell-based biosensors that detect and respond to extracellular protein ligands in mammalian cells. I am particularly interested in utilization of these biosensors for therapeutic applications including modulation of immune responses. This article lays the groundwork for the development and characterization of this cell-based biosensor platform. (Read Daringer's article; DOI: 10.1021/sb400128g).

■ RACHEL M. DUDEK

Rachel M. Dudek

Current Position. PhD Candidate in Chemical and Biological Engineering, Northwestern University. Advisor: Dr. Joshua Leonard.

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Rachel M. Dudek

My scientific interests largely comprise the engineering of mammalian cells to make “smart” cell therapeutics and diagnostics. An important bottleneck in this long-term vision, and the focus of my doctoral research and this paper, is the development of biosensor modalities that would enable these mammalian smart cell devices to sense extracellular cues in their environment and respond appropriately.

Kei Fujiwara

My major research interest is finding a way to construct biomimetic artificial cells that replicate themselves following their genetic information as living cells do. Recent progress in artificial cell engineering and bottom-up synthetic biology has revealed that artificial cells with reconstituted biological systems behave just as those in living cells.

Amar Ghodasara

I am interested in developing tools to enable the engineering of complex biological systems. Mechanistic insights into diseases, the deciphering of the human and plant microbiome, and the whole-genome sequencing of diverse organisms are paving the way and providing the fuel for synthetic biology applications.

George A. Khoury

Through my Ph.D. research, several major advances and tools have been introduced for protein engineering, design, simulations, and folding with modified and natural amino acids combining and applying principles from optimization, thermodynamics, and quantum chemistry. I have applied the tools I developed to design new lead compounds; one that physically blocks a critical step in HIV fusion and another that inhibits Complement activation.

Joshua Leonard

My group seeks to enable the emerging paradigm of design-driven medicine by integrating synthetic biology with systems biology to address pressing challenges in medicine and biotechnology. This manuscript describes an important advance in these efforts.

John M. Marshall

I enjoy the synergy of interdisciplinary collaboration and had a very productive time as a mathematician in Prof. Bruce Hay’s molecular biology lab at Caltech. This paper documents a novel approach to engineering a self-ish genetic element called Medea using a toxin-antidote combination that leads to the element being preferentially inherited among offspring.

Tushar Patel

My doctoral research was focused on the development and characterization of heterogeneous

biocatalysts via enzyme immobilization. One such biocatalyst was a transport-limited whole-cell biocatalyst generated by recombinantly expressing carbonic anhydrase within the periplasm of *E. coli* cells.

Kelly Schwarz

My research focuses on developing a technology that enables cells to sense and respond to their environment specifically through their interaction with extracellular cues. To accomplish this goal, we developed a synthetic protein receptor system for mammalian cells that allows for transduction of extracellular signals, such as an interaction with a protein, into intracellular events—a change in cell state or gene expression, for example.

Brynne Stanton

I'm particularly proud of this work because it represents a significant advancement of not only the number of transcription factors that can be used to control expression in mammalian cells but also because we are contributing an additional mammalian sensor that is both robust and reliable.

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Ranjini Prithviraj

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