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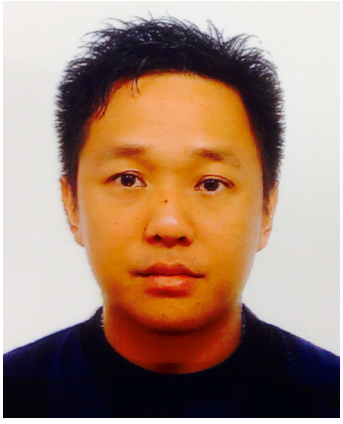
CHUN LOONG HO



Chun Loong Ho

Current Position. Postdoctoral Fellow, Department of Biochemistry, National University of Singapore. Advisor: A/Prof. Matthew Chang.

Education. Ph.D. Biological Sciences, Nanyang Technological University, Singapore (2012). Advisor: A. Prof. Liang Zhao-xun. B. Sc.(Hons) Biotechnology, Universiti Malaysia Sabah, Malaysia (2006). Advisor: A. Prof. Jualang Azlan Gansau.

Nonscientific Interests. Swimming, working out in the gym, stage play, painting and reading.

My PhD work involved engineering protein scaffolds to function as biosensors to detect various c-di-GMP concentrations both, *in vitro* and *in vivo*. My current research focuses on engineering enzymes to increase the enzymatic turnover and survivability under different conditions. This would be used for therapies to address various health related issues. This paper has proven that, using synthetic biological tools, we might be able to employ probiotic cells to kill pathogens that form multidrug resistant biofilm. This has been achieved by using various enzymes and peptides that work in tandem to confer the killing effect, motility, and biofilm degrading property of these cells. This is the first step in engineering probiotic cells to address other health and environmental related issues. (Read Ho's article; DOI: 10.1021/sb400077j.)

IN YOUNG HWANG

In Young Hwang

Current Position. Research Fellow, Department of Biochemistry, National University of Singapore. Advisor: A/Prof. Matthew Chang.

Education. Ph.D. in Molecular medicine and pathology (MMP), University of Auckland (2009). Advisors: Prof. Bruce Baguley and Dr. Catherine Gilchrist. BSc. (Hons), first Class Honors degree in Biomedical Science, University of Auckland (2004). Advisors: Prof. Bruce Baguley and Dr. Bronwyn Siim.

Nonscientific Interests. Sports, travel, and hunting for good local cuisine and coffee.

During my Ph.D., my research interest mainly involved cancer research, focused primarily on investigating the process of ovarian cancer tumorigenesis and developing potential therapeutic and preventive agents. However, my current research focuses on engineering microbes to be effective in targeting a biofilm matrix of infectious pathogenic cells. Here, we have rewired *E. coli* to swim toward a pathogen and deploy targeting peptides to kill and degrade planktonic and biofilm, respectively. Each modular component of this behavior has the potential to be further exploited as biological tools in microbial engineering in both the therapeutic and industrial arenas. I hope to continue working toward the goal of engineering *E. coli* with novel biological functions that can be used for therapeutic benefit. (Read Hwang's article; DOI: 10.1021/sb400077j.)

ELVIN KOH

Elvin Koh

Current Position. Ph.D. Candidate, National University of Singapore Graduate School for Integrative Sciences and Engineering, National University of Singapore. Advisor: A/Prof. Matthew Chang.

Education. B.Sc. in Life Sciences, National University of Singapore.

Nonscientific Interests. I enjoy traveling and exploring new countries and meeting new people. I also enjoy hiking and volunteering during my free time.

Special Issue: Cell-Cell Communication

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I was involved in a wide range of subdisciplines in biology, including marine biology, chemical biology, genetics, and synthetic biology. My research interests lie in engineering synthetic circuits in microbes to perform novel functions with therapeutic properties. In this paper, we successfully engineered two new additional functions into *E. coli* to create an efficient *P. aeruginosa*-targeting killer. This is a step forward by from our previous paper and represents the plethora of potential possibilities that can be created in synthetic biology. Currently, I am working on engineering antimicrobial peptides to create both broad-spectrum and target-specific peptides that can be delivered using a synthetic biological vector. Moving forward, I hope to create efficient broad-spectrum pathogen-killing synthetic biological microbes that can be applied clinically. (Read Koh's article; DOI: 10.1021/sb400077j.)

ANAND PAI

Anand Pai

Current Position. Postdoctoral scholar, University of California, San Francisco. Advisor: Leor Weinberger.

Education. Ph.D. in Biomedical Engineering, Duke University (2013). Advisor: Lingchong You. M.S. in Chemical and Biomolecular Engineering (2006), Ohio University. Advisor: David F. J. Tees. B.E. in Chemical Engineering, Mumbai University (2003).

Nonscientific Interests. I am enchanted by jazz and take every opportunity to attend jazz performances.

My Ph.D. work combined mathematical modeling and synthetic biology to quantitatively examine the workings of bacterial systems, an approach exemplified by this paper. Here, we focused on quorum sensing (QS), the cell−cell signaling mechanism that enables bacteria to coordinate their population-level behavior. We show that the dynamic regulatory properties of a QS system can by quantified using a single metric, sensing potential. We achieve this through a simple model for QS that captures diverse QS systems across bacteria and by utilizing synthetic QS circuits to examine various model predictions. I believe this approach, combining quantitative models with synthetic gene circuits, provides a powerful tool to interrogate natural systems. Indeed, my current work takes this approach to examine the control systems in pathogenic viruses such as HIV. (Read Pai's article; DOI: 10.1021/sb400069w.)

JASMINE SHONG

Jasmine Shong

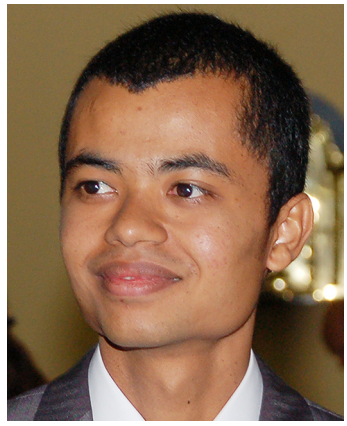
Current Position. I just graduated with my Ph.D. and am currently looking for a job.

Education. Ph.D. in Chemical and Biological Engineering at Rensselaer Polytechnic Institute, Troy, NY. B.S. in Chemical Engineering at National Cheng Kung University, Taiwan.

Nonscientific Interests. Traveling, yoga, cooking, reading, and fashion.

My Ph.D. studies focused on developing quorum sensing (QS)-based tools, including transcriptional regulators and promoters, for use in artificial bacterial expression and cell−cell communication systems. In this article, we demonstrated logic-gate regulatory behaviors in *E. coli* that are governed by cell population and cell−cell communication with the use of hybrid promoters containing the binding sites for the QS regulator protein and a second transcriptional regulator, either LacI or TetR. This study successfully employed the approaches of synthetic biology and inspires new regulatory systems that integrate QS and metabolic or environmental cues for use in applications such as metabolic engineering. In the future, I would like to continue exploring and expanding the applications of QS components and cell−cell communication systems in the field of biotechnology. (Read Shong's article; DOI: 10.1021/sb4000965.)

RAFAEL SILVA-ROCHA



Marcelo Carrizo

Current Position. Postdoctoral fellow, Department of Biochemistry, FMRP-USP Ribeirão Preto, São Paulo, Brazil.

Education. Ph.D. in Molecular Biology at the Universidad Autonoma de Madrid, Spain (2011). Advisor: Víctor de Lorenzo. B.S. in Biology at the Universidade Federal do Pará—UFPa, Brazil (2007).

Nonscientific Interests. Languages, music, sci-fi movies and series, and ancient mythology.

My Ph.D. work has been devoted to (i) the engineering of new tools for the manipulation of gram-negative bacteria such as *Pseudomonas putida*; (ii) the understanding of the mechanisms of signal integration in complex regulatory network; and (iii) the formalization and analysis of regulatory network using Logic Gates and Boolean models. In this work, we addressed the implementation of multicellular logic circuits in bacteria using metabolic compounds instead of quorum-sensing molecules. My general interest is to understand how living cells senses the surround environment and how this information if computed by the specific regulatory network in order to trigger the suitable response. I believe that this knowledge would allow us to engineering new synthetic circuits through the rewiring of exiting complexity, which could display enhanced robustness than orthogonal-like systems. (Read Silva-Rocha's work; DOI: 10.1021/sb400064y.)