Introducing our AUTHORS

Image courtesy of Jonathan Swoboda.

Jennifer Campbell

Current position: Harvard Medical School, Department of Microbiology and Molecular Genetics, Postdoctoral Researcher with Suzanne Walker
Education: Brigham Young University, B.S. in Biochemistry, 2003; University of Wisconsin-Madison, Ph.D. in Organic Chemistry with Helen Blackwell, 2008
Nonscientific interests: Communing with nature through physical activity (hiking, backpacking, kayaking), skiing, traveling, and knitting

I have always been fascinated by the chemistry of life. Obtaining a bachelor's degree in biochemistry provided me with an understanding of complex biological processes. Pursuing a Ph.D. in organic chemistry and chemical biology in the Blackwell lab allowed me to rapidly synthesize, screen, and evaluate biologically relevant molecules. Here, we report the synthesis and screening of natural and non-natural diketopiperazines (DKPs) in quorum sensing (QS) reporter assays. DKPs have attracted considerable attention because they have been reported to both activate and inhibit QS behaviors in certain Gram-negative bacteria at high concentrations. Interestingly, in our hands, the DKPs previously reported to modulate QS reporter strains were all inactive. This work is important and timely, as it serves to refine the lexicon of QS modulators. I have continued my scientific training in the area of bacterial virulence factor synthesis and regulation. My current postdoctoral research is focused on understanding the consequences of blocking wall teichoic acid biosynthesis in *Staphylococcus aureus.* (Read Campbell's article, DOI: 10.1021/cb900165y)

Image courtesy of Nam-Joon Cho.

Nam-Joon Cho

Current position: Stanford University School of Medicine, Division of Gastroenterology and Hepatology, Global Roche Postdoctoral Fellow with Prof. Jeffrey S. Glenn, Ph.D., M.D.
Education: University of California-Berkeley, B.S. in Civil Engineering, 1996; Stanford University, M.S. in Materials Science and Engineering, 2003 and Ph.D. in Chemical Engineering with Prof. Curtis W. Frank, Ph.D., 2006
Nonscientific interests: Developing creative solutions to issues ranging from digital infollution (information + pollution) to science education media

As the leading cause of liver cancer and transplantation in the United States, there is a critical need to understand the fundamental macromolecular interactions of the hepatitis C virus' (HCV) life cycle. One promising approach to studying these interactions is the combination of engineered model membrane platforms together with nanoscale sensor technologies. By applying bottom-up and top-down approaches to the design of these biomimetic sensing platforms, my graduate and postdoctoral research in the Frank and Glenn groups has investigated the necessary membrane–protein and protein–protein interactions of certain HCV nonstructural proteins in order to develop new classes of antiviral therapeutics. This article highlights one part of this research, namely, the identification and characterization of an amphipathic, α-helical peptide derived from the HCV NS5A protein that has potent virus particle lysing activity. Using a biomimetic sensing platform, we examined how virus particle size is related to the peptide's virus particle lysing activity, thereby allowing us to understand how this activity can be translated into a clinically effective antiviral therapy. (Read Cho's article, DOI: 10.1021/cb900149b)

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Image courtesy of Karen Buysse.

Bert De Rybel

Education: VIB–Ghent University, Belgium, M.S. in Bioscience Engineering option cell- and gene-biotechnology, 2005; VIB–Ghent University, Belgium, Ph.D. in Plant Biotechnology with Prof. Tom Beeckman in the department of Plant Systems Biology, 2009 (current position until December 2009) and member of the Compound Screening Facility (CSF) at VIB with Dr. Dominique Audenaert
Nonscientific interests: Squash, hiking, snowboarding

My research at VIB and the Compound Screening Facility (CSF) is focused on using chemical genetics to identify novel key players in plant developmental processes. More specifically, I am using high throughput marker-based small molecule screenings in combination with a lateral root inducible system to study lateral root development in *Arabidopsis thaliana*, in which the plant hormone auxin plays a major role. Our review summarizes how research into plant development in general and auxin research in particular has been closely linked with using small molecules for decades and how novel technologies will allow to tighten this interaction even further. (Read De Rybel's article, DOI: 10.1021/cb9001624)

Image courtesy of Alexander Komarov.

Alexander Komarov

Current position: Postdoctoral Fellow, Oregon Health & Science University, Department of Physiology and Pharmacology with Dr. Francis Valiyaveetil
Education: St. Petersburg State Technical University, Russia, B.S. in Physics (1996) and M.S. in Physics (1998) with Dr. Yuri Orlov; NIH, NICHD Predoctoral Visiting Fellow (2000–2002) with Dr. Sergey Bezrukov; University of Maryland, College Park, Ph.D. in Biology with Dr. Marco Colombini, 2005; Oregon Health & Science University, Vollum Institute, Postdoctoral Fellow with Dr. Michael Forte, 2005–2007
Nonscientific interests: Photography, history, hiking

My research interests are focused on the structure and function of ion channels, particularly on voltage-gated potassium channels and the voltage-dependent anion channel (VDAC) from mitochondria. Experimental analysis of these proteins has relied extensively on site-directed mutagenesis. However, this approach permits only natural amino acid substitutions. For better understanding of the molecular interactions and the architecture of ion channels, we need more precise tools to manipulate protein structure. One such approach is through unnatural amino acid mutagenesis by means of chemical semisynthesis. In this paper, we describe a new modular strategy for the semisynthesis of the potassium ion channel, KcsA. I believe that in the future the chemical semisynthesis approach will find application in the analysis of more complex ion channels. (Read Komarov's article, DOI: 10.1021/cb900210r)