ACS chemical biology

Introducing Our Authors

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MARIA FLOR GARCIA-MAYORAL

Image courtesy of Maria Flor Garcia-Mayoral.

Current position: Researcher at the "Rocasolano" Physical Chemistry Institute, Department of Biological Physical Chemistry, CSIC, Madrid, Spain.

Education: B.S. in Chemistry at the Complutense University of Madrid, Organic Chemistry, 1997, Physical Chemistry, 1999. Ph.D. in Chemistry with Prof. Marta Bruix at the "Rocasolano" Physical Chemistry Institute, Spectroscopy and Molecular Structure Department, CSIC, Madrid, Spain. Postdoctoral Research Fellow at the National Institute for Medical Research, Division of Molecular Structure with Prof. Andres Ramos, MRC, London, U. K.

Nonscientific interests: Reading, music, swimming, skating, aerobics, dancing, traveling.

My current research interests are focused on the studies at the molecular level of diverse biomolecular interactions by using NMR as a tool to unravel the molecular recognition mechanisms that govern physiologically relevant biological processes. I started my scientific career working on the characterization of the structure, dynamics and electrostatics of the cytotoxic RNase α-sarcin and contributed to establish the basis for its structure–function relationships. Afterward, during my postdoctoral period, I moved to work on the characterization of protein-RNA interactions on KSRP, a protein involved in the post-transcriptional regulation of gene expression that affects mRNA degradation. We developed the SIA method for the analysis of the sequence specificity of single-stranded RNA-binding domains. Recently, I have been involved in the characterization of protein–protein interactions of several microtubule-related proteins (TBCC, DYNLL1, DYNLT1), as well as protein–carbohydrate and protein–membrane interactions of the cytotoxic RNase ECP to get insights into the molecular basis of the cytotoxic mechanism of action. (Read Garcia's article, DOI: 10.1021/cb300386v)

IRINA KORYAKINA

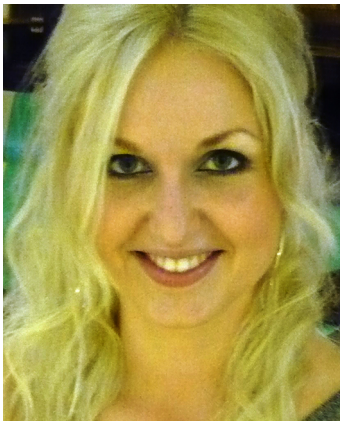

Image courtesy of Irina Koryakina.

Current position: North Carolina State University, Chemistry Department, Ph.D. candidate under the guidance of Prof. Gavin J. Williams

Education: Perm State Pharmaceutical Academy, Russia, B.S. Pharmacy, 2008

Nonscientific interests: Music, traveling, drawing

My current research focuses on altering the substrate specificity of enzymes for use in drug discovery and chemical biology. The primary target of my research is the multimodular polyketide synthases (PKSs) that are responsible for the assembly of a large variety of therapeutically relevant polyketide natural products. Here, we used structure-guided mutagenesis to produce variants of the malonyl-Coenzyme A (CoA) synthetase (MatB) that are capable of synthesizing a broad range of acyl-CoA extender units for polyketide biosynthesis. These promiscuous synthetases were used to probe the specificity of several polyketide biosynthetic systems and revealed unprecedented promiscuity toward several non-natural extender units. Future work will harness this promiscuity by developing new synthetic biology strategies for the regioselective modification of polyketides. Additionally, the incorporation of bioorthogonal handles for chemoselective ligation chemistry should enable the directed evolution of polyketide biosynthesis. (Read Koryakina's article, DOI: 10.1021/cb3003489)

JENNIFER A. LAMBRECHT

Education: Luther College, B.A. in Biology, research with Dr. Jodi Enos-Berlage, 2008; University of Wisconsin-Madison, Ph.D. in Microbiology with Dr. Diana Downs, 2012; Washington University in St. Louis, Postdoctoral Fellow with Dr. Scott Hultgren.

Nonscientific interests: Playing trumpet, cooking, reading, geocaching

My research goal has been to identify and characterize the function of a widely conserved but poorly understood protein,

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Image courtesy of Jennifer A. Lambrecht.

RidA (formerly YjgF). I found that this protein is responsible for neutralizing reactive intermediates that are generated as a normal part of amino acid metabolism. Our paper in *ACS Chemical Biology* details a role for one of these reactive intermediates in generating a thiamine precursor, an unrelated molecule in an unrelated pathway, by a novel mechanism. This work is one example of the amazing connections that continue be found within metabolic networks across all of biology. Further investigation of metabolic connections is critical, as elucidating the interactions between metabolites and pathways may yield important insight into human metabolic diseases and potential treatments. (Read Lambrecht's article, DOI: 10.1021/cb300364k)

ANGIE NG

Image courtesy of Angie Ng.

Current position: Ngee Ann Polytechnic, School of Life Sciences and Chemical Technology, Research assistant with Dr. Sujit Dutta

Education: Nanyang Technological University, B.Sc. (Hons) in Biological Sciences, 2008; National University of Singapore, M.Sc. in Biological Sciences, 2011 with Prof. Kini, R Manjunatha

Nonscientific interests: Singing, reading, cross-stitching, traveling

Protein domains are structurally conserved despite hypervariability in amino acid sequences. My graduate research focuses on determining the key structural determinant(s) of the epidermal growth factor (EGF) domains. In this work, we selected the fourth and fifth EGF domains of thrombomodulin, which fold into the canonical and noncanonical structure, respectively, as models. By comparing the folding tendencies of synthetic peptides based on these domains, we identified a single highly conserved hydrophobic residue in intercysteine loop 3 that acts as the key structural determinant of the canonical fold, without which the EGF domain switches to an alternate fold. The results demonstrate how a single residue can act as a cog in determining protein fold and hence its function. Such fundamental studies provide valuable insights into the evolution of protein folding and structure. (Read Ng's article, DOI: 10.1021/cb300445a)

MARY RODGERS

Image courtesy of Matthew Geiger.

Current position: University of Southern California, Molecular Microbiology and Immunology, Postdoctoral Research Fellow, advisor Dr. Jae Jung

Education: University of Wisconsin-Madison, B.S., Biochemistry, advisor Dr. Anna Huttenlocher, 2004; Harvard Medical School, Ph.D. in Biological and Biomedical Sciences, advisor Dr. Priscilla L. Yang, 2010

Nonscientific interests: Knitting, running, reading fiction, and spending time with family

I am interested in understanding the early changes that occur in a cell upon infection with a pathogen and how those processes are regulated or misregulated in human disease. In the current study, we have focused on characterizing the immediate effects of Dengue virus infection on the host kinome using ATP- and ADP-acyl phosphates as chemical probes for mass spectrometry. My graduate thesis work also applied mass spectrometry-based profiling to examine hepatitis B virus- and hepatitis C virus-induced changes in the host lipidome, and all of these studies have uncovered new host−pathogen interactions. As a postdoctoral fellow, I am focusing on innate immune responses to understand how pathogen detection is regulated by host factors and how these responses affect cell and host survival. (Read Rodger's article, DOI: 10.1021/cb300420z)