ACS chemical biology

Introducing Our Authors

pubs.acs.org/acschemicalbiology

ANNA BILOTTA

Image courtesy of Anna Bilotta.

Current position: Ph.D. student in Molecular Oncology, Experimental Immunology and Development of Innovative Therapies, University "Magna Graecia" of Catanzaro, Department of Experimental and Clinical Medicine "S. Venuta", Catanzaro, Italy. Advisor: F. Trapasso

Education: University "Magna Graecia" of Catanzaro, Italy, Magistral Degree in Medical, Veterinary and Pharmaceutical Biotechnology, 2010

Nonscientific interests: Music, reading, cooking, artistic drawing, and wedding dress design

My precedent research was focused on innovative biomarkers discovery involved in chemio-therapy resistance by proteomic approach. In particular I used bidimensional analysis followed by LC−MS/MS spectrometry to discover qualitative and quantitative protein difference in plasma samples of pancreatic cancer patients treated by Gem-Ox therapy. My actual research is centered on the Receptor Protein Tyrosine Phosphatase, PTPRJ. In collaboration with my colleagues, using phage display screening, we identified peptides able to activate the receptor and in this way induce inhibition of proliferation and increase of apoptosis in cancer cells. Additionally, these peptides were assayed in endothelial cells to identify their anti-angiogenetic effects. In a second line of research, we showed that miR-328 targets and negatively regulates PTPRJ expression. My current studies are centered on the identification of new PTPRJ ligands and the validation of possible interaction with two kinase receptors using a spectrometric approach. (Read Bilotta's article, DOI: 10.1021/cb300281t)

CASEY COSTELLO

Image courtesy of Josée Doris.

Current position: Scientific Documentation Researcher and Writer for Le Naturiste

Education: McGill University, Montreal, QC, Bachelor of Sciencein Chemistry, 2006; McGill University, Montreal, QC, Graduate Certificate in Environmental Studies, 2007; University of Alberta, Edmonton, AB, Master of Science in Organic Chemistry, 2010, Supervisor: Dr. David Bundle

Nonscientific interests: Irish dancing, fashion, cooking

The development of a conjugate vaccine against *Candida albicans* is the subject of ongoing research in the Bundle group. Following the demonstration that the maximum activity of synthetic β1-2 mannan oligomers as inhibitors of the monoclonal antibody C3.1 was achieved with di- and trisaccharides, my graduate work focused on the synthesis of trisaccharide congeners to investigate frame shifting in the antibody binding site. This was an extremely exciting project to be a part of due to the fascinatingly atypical pattern of inhibition of the antibody by oligosaccharides. By shedding light on the antibody binding site, this work takes us one step closer toward a vaccine. (Read Costello's article, DOI: 10.1021/cb300345e)

EUGENIO GAUDIO

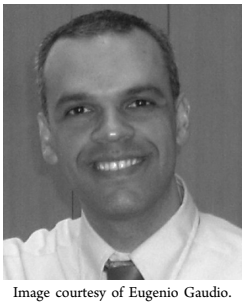

Image courtesy of Eugenio Gaudio.

Current position: Research Associate at the Ohio State University, Department of Molecular Virology, Immunology and Medical Genetics. Comprehensive Cancer Center, Columbus, OH

Education: University of Calabria (UNICAL), B.S. and M.S. in Biological Sciences, 2003; University of Catanzaro/The Ohio State University, Ph.D. in "Molecular Oncology, Experimental Immunology and Development of Innovative Therapies" with Profs Dr. Francesco Trapasso and Carlo M. Croce, 2009

Nonscientific interests: Family, health, naturalistic documentaries

My Ph.D. research focused on Fhit (Fragile Histidine Triad) tumor suppressor protein and its role in the reduction of the paclitaxel resistance Annexin-4 dependent. During my post doctorate time, my studies were about Tcl1 (T-cell leukemia/lymphoma protein 1A) and its role in the development and malignancy of chronic lymphocytic leukemia (CLL) and B-cell Lymphoma. I was able to demonstrate that Tcl1 interacts with ATM and enhances the activation of the NF-kB pathway. Other studies are about Tcl1's interacting proteins and synthesis of new anti-cancer drug specifically targeting Tcl1 protein. (Read Gaudio's article, DOI: 10.1021/cb300281t)

Published: October 19, 2012

 © 2012 American Chemical Society dx.doi.org/10.1021/cb300516s | *ACS Chem. Biol.* 2012, 7, 1609−1613

OZDEN KOCAOGLU

Image courtesy of Ozden Kacaoglu.

Current position: Ph. D. candidate in the Department of Molecular and Cellular Biochemistry at Indiana University, Bloomington; Advisor: Prof. Erin E. Carlson

Education: Cumhuriyet University, Turkey, B.S. in Chemistry, 2005

Nonscientific interests: Movies, music, hiking, cooking

My research is focused on the synthesis and application of imaging agents for bacterial cell wall biosynthesis. I am particularly interested in penicillin-binding proteins (PBPs), enzymes involved in the production of peptidoglycan, a polymeric structure commonly targeted in antibiotic therapy. Although the basic roles of the PBPs are characterized, the individual functions of the multiple homologues present in a given organism are often poorly defined. In this study, we designed and synthesized fluorescent and biotin derivatives of the β-lactam-containing antibiotic cephalosporin C for selective examination of a subset of PBPs. These probes facilitated specific *in vivo* labeling of active PBPs in both *Bacillus subtilis* and *Streptococcus pneumoniae*. (Read Kacaoglu's article, DOI: 10.1021/cb300329r)

PAUL LEVINE

Image courtesy of Paul Levine.

Current position: Graduate student pursuing Ph.D. at New York University under the supervision of Professor Kent Kirshenbaum

Education: University of California, Santa Cruz, B.S. in Chemistry with Professor Bakthan Singaram, 2009; New York University, New York, M.S. in Chemistry with Professor Kent Kirshenbaum, 2011

Nonscientific interests: Music, art, basketball, family, and spending time with my dogs

My research focuses on the design and synthesis of bioactive multivalent architectures that target the androgen receptor (AR), an important drug target for treatment of prostate cancer. Using modularly assembled sequence-specific peptoid oligomers, we have established a versatile platform with broad utility in chemical biology and a new class of molecules that modulate AR activity. In particular, we have identified a linear and a cyclic divalent conjugate that exhibit potent and selective antiproliferative activity in prostate cancer cells that model advanced disease. Importantly, the conjugates antagonize the AR *via* distinct mechanisms of action, providing the potential to circumvent drug resistance in AR pharmacology. (Read Levine's article, DOI: 10.1021/cb300332w)

TOMASZ LIPINSKI

Image courtesy of Wojciech Rybka.

Current position: Adjunct at Institute of Immunology and Experimental Therapy of Polish Academy of Sciences and leader of a research project at Wroclaw Research Centre EIT+, Wroclaw, Poland

Education: University of Wroclaw, Wroclaw, Poland, M.Sc. in Biotechnology, 1994; Institute of Immunology and Experimental Therapy of Polish Academy of Sciences, Wroclaw, Poland, Ph.D. in Life Sciences with Prof. A. Gamian, 2000; National Institute for Biological Standards and Control (NIBSC), Potters Bar, U.K., NATO sponsored postdoctoral fellowship with Dr. Chris Jones; University of Alberta, Edmonton, Canada, postdoctoral fellow with Prof. David Bundle, 2004–2006; Research Associate in Bundle's lab, 2006–2010

Nonscientific interests: Hiking, canoeing, books, history

My Ph.D. and first postdoctoral research was aimed at studies on bacterial polysaccharides and lipopolysaccharides, their structures, biological activity and potential epitopes as targets for new vaccines. After joining Prof. Bundle group, I was involved in studies on synthetic inhibitors of bacterial toxins and the project on a synthetic vaccine against *C. albicans*. The work described in this paper brings together efforts across several research fields and presents a successful implementation of a modern approach for vaccine design by reversed engineering. Earlier studies showed that protective monoclonal antibodies binds short β-mannan oligosaccharides in an unusual manner. Extensive study allowed to explain this phenomenon and provided inspiration for rational design of an experimental vaccine. This vaccine shows protective potential while utilizing uniquely small carbohydrate epitope. (Read Lipinski's article, DOI: 10.1021/cb300345e)

LESLIE MORTON

Image courtesy of Leslie Morton.

Current position: Graduate student pursuing a Ph.D. at the University of Colorado under the supervision of Dr. Hubert Yin in the Biochemistry department in Boulder, Colorado

Education: University of North Carolina at Chapel Hill, B.S. in Chemistry, 2008

Nonscientific interests: Running in race events, reading, traveling, zhumba, piano, social service

My research interests include combining chemical biology and biochemistry using membrane-derived peptides for applications in biotechnology. Specifically, my Ph.D. focuses on membrane curvature and identifying and designing peptides that target highly curved vesicles. Our lab has identified a 25-residue peptide that preferentially binds to nanosized lipid vesicles based on lipid composition in a sequence specific manner observed through *in vitro*, *ex vivo*, and *in vivo* assays. Currently, I am focused on better understanding the molecular peptide-lipid interactions and the mechanism of how this membrane protein-derived peptide prefers highly curved nanovesicles through a biophysical approach using electron paramagnetic resonance and isothermal calorimetry. This research will potentially contribute to the understanding of how proteins and peptides sense membrane curvature in hopes of developing small peptides designed for extracellular vesicle detection to study cancer metastatic and cell apoptotic behavior. (Read Morton's article, DOI: 10.1021/cb3002705)

CORWIN NYCHOLAT

Image courtesy of Anna Tran-Crie.

Current position: Senior Research Associate with Prof. James Paulson, The Scripps Research Institute La Jolla, Department of Chemical Physiology. Director, Carbohydrate Synthesis Core, Lung Inflammatory Disease Program of Excellence in Glycosciences, The Scripps Research Institute La Jolla

Education: University of Alberta, Department of Chemistry, Ph.D. in Chemistry, advisor Prof. David R. Bundle, 2008; University of Saskatchewan, Department of Chemistry, M.Sc. in Chemistry, advisor Prof. M. S. C. Pedras, 2001; University of Saskatchewan, College of Agriculture, BSA in Agriculture Chemistry, 1997

Nonscientific interests: Hockey, running, spending time with my wife and children

My research interests include the synthesis of glycans for use as diagnostic and therapeutic tools. At present within the lab of Prof. James Paulson, I am working on several projects including the chemo-enzymatic synthesis of sialosides to explore the receptor specificity of influenza A viral hemagglutinin and neuraminidase, and the development of high-affinity ligands of Siglecs for targeted drug delivery. These interests arose from my Ph.D. work with Prof. David Bundle, which is partly described in this paper. Here we used synthetic glycans to study the epitope recognized by a protective monoclonal antibody which binds to β1-2-linked mannan present on the cell wall of *Candida albicans*. These results allowed design of a candidate vaccine showing reduced levels of fungal infection in a rabbit model. (Read Nycholat's article, DOI: 10.1021/cb300345e)

FRANCESCO PADUANO

Image courtesy of Francesco Paduano.

Current position: University "Magna Graecia" of Catanzaro, Department of Experimental and Clinical Medicine, Doctoral Researcher with F. Trapasso since September 2006

Education: University of Calabria, Italy, Degree in Biological Sciences, 2003; University of Milano-Bicocca, Italy, Master in Bioinformatics, 2006; University "Magna Graecia" of Catanzaro, Campus "S. Venuta", Catanzaro, Italy, Ph.D. in Molecular Oncology, Experimental Immunology and Development of Innovative Therapies, 2012

Nonscientific interests: Computers and technology, fantascientific movies, reading, sports

My scientific interests focus on the protein−protein interactions in signaling cascades, especially interactions between protein kinases and phosphatases and their involvement in cancer. A major part of my research is focused on the study of PTPRJ receptor-type protein tyrosine phosphatase. My colleagues and I identified peptides able to bind as dimers the receptor protein tyrosine phosphatase PTPRJ; their binding triggers PTPRJ signaling cascade resulting into cell growth inhibition and apoptosis. My other research interests focus on evaluation of the cellular effects of microRNAs targeting the receptor protein tyrosine phosphatase PTPRJ in human cancer cells. We presented the identification of miR-328 as an important player in the down-regulation of PTPRJ expression and we proposed that the interaction of miR-328 with PTPRJ is responsible for the miR-328-dependent increase of epithelial cellular proliferation. (Read Paduano's article, DOI: 10.1021/cb300281t)

YAPING PAN

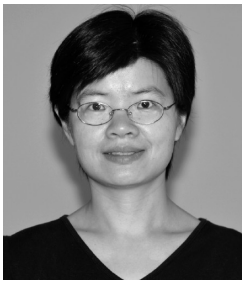

Image courtesy of Yaping Pan.

Current position: Columbia University, Department of Physiology and Cellular Biophysics, Associate Research Scientist with Dr. Ming Zhou

Education: Fudan University, B.S. in Pharmacology, 1999; Peking Union Medical College, Ph.D. in Pharmacology with Dr. Xiaoliang Wang, 2004; Baylor College of Medicine, Postdoctoral Associate with Dr. John Dani, 2004−2005; Columbia University, Postdoctoral Research Scientist with Dr. Ming Zhou, 2006−2011

Nonscientific interests: Cooking, reading, movies, traveling with family

My research is focused on the structure−function analysis of Kv1 channels and Kvb subunits. Kvb1 has an inactivation gate and confers the rapid inactivation as "ball and chain" mechanism to Kv1 channels. Two novel different kinds of channel modulation by Kvb have been identified: (1) I found that Kvb1 is an aldo-keto reductase. When the NADPH cofactor is enzymatically oxidized to NADP+ by an aldehyde substrate, Kv1 channel current increases dramatically. These properties suggest that the Kv1-Kvb complex is capable of transducing a change in cellular metabolic redox state into a change in channel activity and hence cell excitability. (2) I found that one corticosteroid, cortisone, can distinctively bind to Kvb1 and induce Kvb1 dissociation from the channels. This effect relieves channel inactivation and increases the current. The structure−activity relationship study of cortisone analogues on Kv1 channel was also performed. (Read Pan's article, DOI: 10.1021/cb300233y)

J. GENEVIEVE PARK

Image courtesy of Kevin Dean.

Current position: M.D./Ph.D. student at the University of Colorado Denver School of Medicine, completing a Ph.D. in the laboratory of Dr. Amy Palmer in the Department of Chemistry and Biochemistry at the University of Colorado Boulder

Education: Massachusetts Institute of Technology, B.S. in Biology, 2005

Nonscientific interests: Cooking, eating, reading, and yoga

My research in the Palmer Lab is focused on developing, characterizing, and using new tools for studying zinc biology. For over 50 years, physicians have recognized the important role of zinc in human nutrition, immunity, growth, and brain function, and scientists continue to make new discoveries about how changing cellular zinc levels affect the life, death, and function of human cells. Our approach is to engineer zinc biosensors, which are constructed from fluorescent proteins, to observe zinc dynamics at subcellular resolution in living cells. We hope that our tools will help scientists understand how zinc homeostasis affects cell function and how this relates to human health and disease. (Read Park's article, DOI: 10.1021/cb300171p)

IAN ROMAINE

Image courtesy of Ian Romaine.

Current position: Vanderbilt University, Vanderbilt Institute of Chemical Biology, Drug Discovery Scientist

Education: Vanderbilt University, Ph.D., Organic Chemistry, 2011, Advisor: Prof. Gary A. Sulikowski; MTSU, M.S., Chemistry, 2004, Adviser Prof. Norma Dunlap; Lipscomb University, B.S., Biochemistry, 2000

Nonscientific interests: Camping, backpacking, spending time with my wife and son

My current work in the Zwiebel lab is focused on Drug Discovery approaches to synthesize compounds that further the potency and efficacy in both agonism and antagonism of the odorant coreceptor (ORco) in many insect species. My graduate work with Dr. Sulikowski focused on the assignment of absolute stereochemistry about the biaryl bond in the Hibarimicin class of natural products in our approach to a total synthesis of the shunt mutant HMP-Y1. Our current paper describes the relative progression of a molecule class known as the VUAA series to increase the potency and efficacy in agonism of the ORco receptor in the Insect orders: diptera, lepidoptra, and hymenoptera. Providing not only new tool compounds but also demonstrating the broad impact that this series of compound could have against all insects. (Read Romaine's article, DOI: 10.1021/cb300331z)

JONEL P. SALUDES

Image courtesy of Trent Amonett.

Current position: Assistant Professor at Department of Chemistry, Washington State University, Pullman, WA

Education: University of San Agustin, Iloilo, Philippines, B.S. Chemistry, 1991; University of Santo Tomas, Manila, Philippines, M.S. Natural Products Chemistry, 1999, Advisors: Prof. Alicia Aguinaldo and Prof. Mary Garson; University of California Davis, CA, Ph.D. Organic Chemistry, 2009, Advisor: Prof. Jacquelyn Gervay-Hague; University of Colorado Boulder, CO, Postdoctoral Fellow, 2010−2012 Advisor: Prof. Hang (Hubert) Yin

Nonscientific interests: Mountain hiking and riding my road bike during summer and snowboarding and cross-country skiing in winter

My research interest is to harness the potential of peptides to deliver bioactive molecules across the membrane bilayer, study cancer progression, and probe signal transduction. Efforts are focused on the design and synthesis of natural and unnatural peptides and the characterization of their interactions with membrane bilayers. I am experienced in solution and solid phase organic synthesis, spectroscopy, and bioanalytical methods to solve problems at the interface of chemistry and biology. The current paper demonstrated a proof-of-concept that a designed peptide from the active site of a lipid binding protein could bind liposomes and translate this to exosome sensing. Proliferating cancer cells use exosomes to facilitate their movement to other body organs, and the ability to sense these particles may lead to innovative ways to detect cancer progression. (Read Saludes' article, DOI: 10.1021/cb3002705)

DANIELLE STACY

Image courtesy of Nora Eibergen.

Current position: NSF graduate research fellow in chemistry at the University of Wisconsin−Madison, Research Advisor: Prof. Helen E. Blackwell

Education: Truman State University, B.S. in Chemistry, Research Advisor: Prof. Anne E. Moody

Nonscientific interests: Competing in triathlons, ultimate frisbee, and volleyball; playing with my Catahoula Leopard Dog and Collie

At Truman State University, I quantified and assessed the influence of elaiosome fatty acid content on mymechory seed propagation. In my doctoral research, I have designed, synthesized, and analyzed biological activity of small molecules and peptides for the inhibition of bacterial pathogenesis, primarily in the pathogens *Staphylococcus aureus* and *Acinetobacter baumannii*. I can access such inhibitors by targeting quorum sensing, a signaling system that allows bacteria to coordinate group phenotypes. In this work, we report the elucidation of *A. baumannii*'s natural quorum sensing signal and also the inhibition of quorum sensing and two related phenotypes in this pathogen. (Read Stacy's article, DOI: 10.1021/cb300351x)

ROBERT TAYLOR

Image courtesy of Anne Rayner.

Education: Maryville College, BA, Dr. Andrew Crain advisor; Vanderbilt University, Ph.D, Dr. Joshua Gamse advisor; Vanderbilt University, PostDoc, Advisor: Dr. Laurence Zwiebel

Nonscientific interests: Basketball, baking biscuits, and keeping up with my 8-month old son, Frank

My work on the molecular and chemical biology of the mosquito olfactory system is a big departure from my graduate training, but it is a very exciting field with new discoveries monthly by a growing number of laboratories. The generation of new chemical tools that directly manipulate the sensory systems that instruct insect behavior has been very satisfying scientifically, and will hopefully lead to beneficial applications in the near future. The other authors and I hope this article will inform the next generation of insect exitorepellent molecules by defining the chemical space around the interaction of OR receptors and VUAA-class compounds. (Read Taylor's article, DOI: 10.1021/cb300331z)

MICHAEL WELSH

Image courtesy of Michael Welsh.

Current position: Graduate student in Chemistry at the University of Wisconsin−Madison, Advisor: Prof. Helen E. Blackwell

Education: Washington and Lee University, B.S. in Chemistry, 2009, Research Advisor: Prof. Marcia B. France. Postbaccalaureate fellow, National Cancer Institute, 2010, Advisor: Lalage M. Wakefield

Nonscientific interests: Running, music, Premier League soccer

My undergraduate research focused on the synthesis of chiral ligands for application in asymmetric catalysis. I then spent a year at NCI investigating the role of TGF-β in breast cancer metastasis. I've found my graduate work at Wisconsin to be an ideal marriage between my dual interests in organic chemistry and molecular biology. My current research aims to combat the formation of bacterial biofilms by quorum sensing inhibition and to elucidate the molecular mechanisms of other small molecule biofilm modulators. (Read Welsh's article, DOI: 10.1021/cb300351x)