Introducing our AUTHORS

Image courtesy of Maria Guala.

Angela Berzi

Current position: University of Milan, Milan, Italy, Department of Preclinical Sciences, Ph.D. student in molecular medicine with Prof. Mario Clerici and Prof. Daria Trabattoni
Education: University of Milan, Milan, Italy, M.S. in pharmaceutical biotechnologies, 2003
Nonscientific interests: Music, swimming, trekking

As sexual exposure is the major route of transmission of HIV worldwide, my research is focused on identifying effective and safe microbicides to prevent HIV infection and other sexually transmitted infections. DC-SIGN, because of its important role in facilitating HIV dissemination from initial target cells, is a promising target for microbicide development. In this study I set up an HIV *in vitro* infection assay using a cell line expressing DC-SIGN. I employed this assay to test the ability of synthetic glycomimetic compounds, endowed with high binding affinities to DC-SIGN, to block HIV infection DC-SIGN mediated. As a consequence of the results obtained (reported in this paper), I plan to better evaluate efficacy against HIV infection and safety of synthetic DC-SIGN inhibitors in a human cervicovaginal explants model. (Read Berzi's article, DOI: 10.1021/cb900216e)

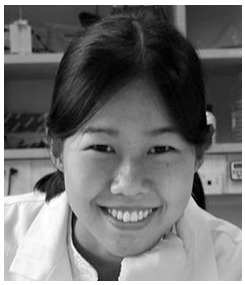

Image courtesy of Christina S. Murrey.

Lynne Chantranupong

Current position: Undergraduate Research Assistant for Dr. George Georgiou, Department of Chemical Engineering, University of Texas at Austin
Education: Senior at University of Texas at Austin, B.Sc. in cell and molecular biology (Spring, 2010)
Undergraduate research advisors: Dr. George Georgiou, Department of Chemical Engineering, University of Texas at Austin (2008–present); Dr. James J. Bull and Dr. Rick H. Heineman, Section of Integrative Biology, University of Texas at Austin (2007–2008)
Nonscientific interests: Reading, music, movies, spending time with family and friends

My research in the Georgiou laboratory is focused on developing human enzymes that catalyze therapeutically important reactions. Specifically, I worked on human arginase I and used a variety of engineering and biochemical techniques to optimize its kinetics under physiological conditions and enhance its *in vivo* stability. This engineered arginase now has the potential to become a potent chemotherapeutic agent against L-arginine auxotrophic cancers such as melanomas and hepatocellular carcinomas. Currently, I am working on engineering additional human asparaginases and arginases with therapeutic potential. I find the possibilities in the area of protein engineering and novel drug development exciting, and I hope to continue my graduate studies in this field. (Read Chantranupong's articles, DOI: 10.1021/cb900267j)

Image courtesy of Tam Dang.

Tam Dang

Current position: Imperial College London, Department of Chemistry, final year Ph.D. student with Dr. Edward Tate and Prof. Neil Fairweather
Education: University of Rostock, Germany, M.S. in organic chemistry, 2007
Nonscientific interests: Playing guitar, art, reading and cooking

During my Ph.D. study I have developed and applied activity-based probes (ABPs) in bacterial systems to track down new proteases and potential drug targets. In this paper we synthesized chemical probes that can disrupt surface layer ("S-layer") formation in the antibiotic-resistant pathogen *C. difficile* by inhibiting a protease involved in S-layer formation. We have found that these compounds are powerful chemical tools for both protease identification and exploring the process of S-layer formation, something not easily achieved by genetic means. We show that the protease can be labeled by synthetic inhibitors carrying an affinity tag or bioorthogonal tag, and we used this approach to isolate and identify the protease involved in the cleavage process. (Read Dang's article, DOI: 10.1021/cb9002859)

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Introducing our AUTHORS

Image courtesy of Lucia de la Riva.

Lucia de la Riva

Current position: Imperial College London, Centre for Molecular Microbiology and Infection, Research Associate with Professor Neil Fairweather and in collaboration with Dr. Edward Tate

Education: Universidad de Sevilla, B.S. in biology, 2003; Universitat de Barcelona, Advanced Studies Degree in biotechnology, 2005; Universitat de Barcelona, Ph.D. in molecular microbiology, 2008

Nonscientific interests: Traveling, exploring places unknown to me, trekking, learning languages, gastronomy, swimming, music

I am very interested in deciphering how microorganisms can cause disease. I think it is fascinating how organisms such as bacteria, which consist of only a single cell, have developed such sophisticated mechanisms to infect their hosts. At the Centre for Molecular Microbiology and Infection I am studying one of the steps that lead to the production of the S-layer, which plays an important role in adherence to human intestinal cells, on the surface of *C. difficile*. We microbiologists are working along with chemists on the identification of *C. difficile* enzymes that are relevant to pathogenicity. (Read de la Riva's article, DOI: 10.1021/cb9002859)

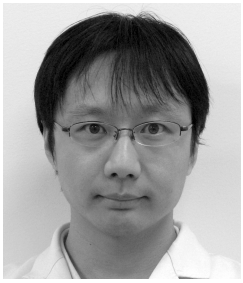

Image courtesy of Ippei Kotera.

Ippei Kotera

Current position: Hokkaido University, Research Institute for Electronic Science, Postdoctoral Researcher with Prof. Takeharu Nagai

Education: University of Colorado, Boulder, B.A.S in biology, 1997; Nara Institute of Science and Technology, M.S. in biology, 2000; Osaka University, Ph.D. in biology with Prof. Yoshihiro Yoneda, 2005

Nonscientific interests: Alpine skiing, building imaginary cities in my head

As a Ph.D. candidate, my research interest was how eukaryotic cells transport nuclear proteins to the nucleus. Throughout my graduate study I felt the need for visualizing molecular interactions in living cells and hence decided to join Prof. Nagai's group as a postdoctoral fellow to develop methodologies for imaging molecular events in live cells. FRET-based GFP probes have become indispensible tools to noninvasively visualize various cellular events. However, the art of building high-performance FRET-based probe is largely by trial and error. We have realized that GFP with a monomeric mutation reduces FRET efficiency and have carried out systematic analysis of how mutations at the dimerization interface affect the performance of FRET-based probes. Our conclusions are that orienting the donor and acceptor GFP variants in such way that they interact by the dimerization interface is important and that the interface should not be mutated to enhance or reduce the natural dimerization. I hope the findings may assist the development of high-performance FRET-based GFP probes in your laboratory. (Read Kotera's article, DOI: 10.1021/cb900263z)

Image courtesy of Josè Juan Reina.

Sara Sattin

Current position: ICIQ - Institute of chemical Research of Catalonia, Tarragona, Spain, Post-Doctoral Researcher with Javier de Mendoza

Education: Universita' degli Studi di Milano, Ph.D. in chemical sciences with Anna Bernardi, 2009; M.S. in industrial chemistry and management, 2006; B.S. in industrial chemistry, 2004

Nonscientific interests: Swimming, reading and listening music

During my Ph.D. study at the University of Milano my research had been focused on the synthesis of glycomimetic structures of oligomannosides both in monovalent and polyvalent presentation. In particular we aimed to build up good ligands of the dendritic cell receptor DC-SIGN. I enjoyed the synthesis itself, but I was even more attracted by the biological activities of the products and by their potential pharmaceutical applications. Another interesting aspect of this project was the collaboration established with groups from other countries; in fact, some of them are now not just colleagues but good friends. (Read Sattin's article, DOI: 10.1021/cb900216e)

Introducing our AUTHORS

Image courtesy of Macarena Sánchez-Navarro.

Macarena Sánchez-Navarro

Current position: Universidad Complutense of Madrid, Departament of Organic Chemistry, Postdoctoral Fellow with Prof. Nazario Martín

Education: University of Granada, B.S. in chemistry, 2005; University of Seville, Ph.D. in chemistry with Dr. Javier Rojo, 2009

Nonscientific interests: Traveling, reading, cooking, socializing with friends, music, movies

My research interests have been focused on the study of glycodendrimers as valuable systems to study carbohydrate−protein interactions. In particular, I have been working in the design of glycodendrimer structures to study the interaction with DC-SIGN (dendritic cell-specific ICAM-3 grabbing nonintegrin), a C-type lectin able to recognize highly glycosylated proteins, especially those presenting high mannose structures such as the viral envelop glycoproteins gp120 (HIV), GP1 (Ebola) or glycoprotein E (Dengue). For this, I have developed a versatile synthetic route to prepare small tetravalent carbohydrate dendrons conveniently functionalized from 2,2′-bis(hydroxymethyl)propanoic acid. This scaffold allows multivalent interactions with the receptor without interference from the dendrimer skeleton. (Read Sánchez's article: DOI: 10.1021/cb900216e)

Image courtesy of Hannah Day.

Everett Stone

Current position: University of Texas at Austin, Chemical Engineering Department, Postdoctoral Fellow/Research Associate with Dr. George Georgiou

Education: Drury University, B.A. in chemistry and biology, 2002; University of Texas at Austin, Ph.D. in cell and molecular biology with Dr. Walter Fast, 2006

Nonscientific interests: Blacksmithing, books, gastronomy, great conversations

My research employs classic enzymology and modern protein engineering techniques to create novel cancer therapeutics using human enzymes as a scaffold. For example, there are numerous cancers that auxotrophic for certain amino acids, thus depleting this amino acid results in selective tumor killing, while normal cells survive. The use of an enzyme to accomplish selective amino acid depletion results in a "catalytic" drug, requiring far less dosing than a therapeutic that works stoichiometrically. A human enzyme is used as a drug scaffold in order to avoid life-threatening immune responses that can arise with enzymes derived from xenobiotic sources. I am currently engineering human enzymes that have improved or novel activity for degrading L-arginine, L-asparagine, and L-Methionine, applicable to cancers such as hepatocellular carcinoma, acute lymphoblastic leukemia, and neuroblastoma. (Read Stone's article, DOI: 10.1021/cb900267j)

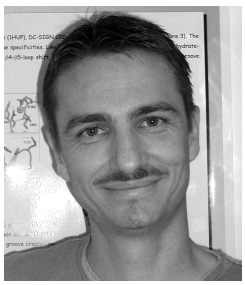

Image courtesy of Eric Chabrol.

Michael Thépaut

Current position: Research engineer, Membrane & Immunity Team, Institut de Biologie Structurale, Grenoble, France (2010)

Education: Ph.D. in chemistry/biology interface with A. Padilla and C. Dumas at Montpellier University of Science & Technology, France, 2004; Postdoctoral position on structure and function of two C-type lectins with Prof. F. Fieschi in Membrane & Immunity Team, Institut de Biologie Structurale, Grenoble, France, 2005/2009

Nonscientific interests: Hiking, snow-board, animal photo in mountain, motorcycling

At the IBS, I am a member of the Membrane & Immunity Team, which focuses on host-pathogen interactions (NADPH oxidase complex, HIV coreceptors and lectine receptors). I am particularly implicated in structural and biochemical characterization of these lectin receptors and their interaction with glycomimetic ligands. I am involved in a dynamic European network including chemists, biologists, and biochemists that develops these glycomimetic ligands. My contribution in this project is production of the protein targets, SPR analysis of biomolecular interactions between the receptors and designed ligands, and structure resolution of complexes. In addition, part of my work consists in the development and operation of a platform dedicated to membrane protein purification. (Read Thépaut's article, DOI: 10.1021/cb900216e)