Christina Vizcarra

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Assistant Professor, Department of Chemistry, Barnard College

Education

Ph.D., Chemistry, California Institute of Technology — 2008

B.S., Chemistry and Mathematics, University of Kansas — 2002

Research

Vizcarra Lab, Department of Chemistry, Barnard College — 2015 – present

Biochemistry of cytoskeletal regulatory proteins that are associated with deafness and metalloneurochemistry.

Quinlan Lab, Department of Chemistry & Biochemistry, UC Los Angeles — 2008 – 2015

Using biochemistry, structural biology, and fluorescence microscopy to study the actin regulatory proteins Cappuccino and Spire and their role in *Drosophila* development.

Physiology Course, Marine Biological Laboratory, Woods Hole, MA — Summer 2007

Mayo Lab, Division of Chemistry & Chemical Engineering, Caltech — 2002 – 2008

Thesis title: "Development and evaluation of protein design methods for functional targets"

Benson Lab, Department of Chemistry, University of Kansas — 2000 – 2002

Honors, Awards & Grants

"Small Molecule Inhibition of Formin Proteins: Specificity and Mechanisms of Action" — 2019-2022

Cottrell Scholars Award, Research Corporation for Science Advancement ($100,000, #25929), *PI*

"Molecular mechanisms underlying formin-associated inherited deafness" — 2018-2021

R15-AREA, National Institute on Deafness and Other Communication Disorders, National Institutes of Health ($424,597, #1R15DC016462), *PI*

"MRI: Acquisition of an integrated Confocal and TIRF fluorescence microscope for multidisciplinary research and teaching at Barnard College" — 2018-2021

Division of Biological Infrastructure, National Science Foundation ($563,266, #1828264), *PI with co-PI's J. Mansfield and R. Silver*

"RUI: A mechanistic understanding of the impact of metal ions on the chemistry of metallothionein-3 structure & function in neuronal cells" — 2017-2020

Division of Chemistry, National Science Foundation ($294,000, #1710176), *co-PI with M. Sever (PI) and R. Austin*

NRSA Postdoctoral Fellowship, National Institutes of Health — 2009 - 2012

Graduate Research Fellowship, National Science Foundation — 2003 – 2007

Rosen Fellowship, Caltech — 2002 – 2003

ACS Scholar, American Chemical Society — 2001

Teaching & Outreach

CHEM BC3348: Advanced Spectroscopy Laboratory, *Instructor* — Spring 2018

CHEM BC3902: Chemistry Senior Thesis Seminar, Barnard College, *Instructor*	Spring 2017
CHEM BC1003: Chemical Problem Solving, Barnard College, *Instructor*	Fall 2016
CHEM BC3282: Biochemistry I, Barnard College, *Instructor*	Fall 2016, 2017
CHEM BC3283: Biochemistry II, Barnard College, *Instructor*	Spring 2016, 2017, 2018
CHEM BC3355: Biochemistry Laboratory Techniques, Barnard College, *Instructor*	Fall 2015
Chem 156: Physical Biochemistry, UCLA, *Co-Instructor*	Spring 2013
UCLA Bioscience Postdoc Educational Leadership Program, *Participant*	Spring 2012
Caltech Classroom Connection, *Classroom Assistant*	2007– 2008

Service

Discussion Facilitator, Inclusive Pedagogy Workshop, Barnard College, Dec 2017

Science Pathways Scholars Program mentor, Barnard College, *Fall 2016 - present*

Medalist Committee, Barnard College, *Fall 2016*

Search committee for Inorganic Chemistry Faculty, Barnard College, *Fall 2015*

Graduate School Panel with Barnard Chemical Society, Barnard College, *Oct 23, 2015*

Meet the Professor lunch with Barnard Chemical Society, Barnard College, *Nov 5, 2015*

Research students

Lisa Minkoff ('19), *Fall 2017 - present*

Carla Hachicho ('19), *Summer Research Institute 2017 - present*

Lisette Garcia ('18), *Spring 2018*

Angela Montero ('20), *Summer Research Institute 2017*

Neda Kashani ('17), *Spring 2017*

Christina Costeas ('18), *2016 - present*

Grace Nickel ('19), *Summer Research Institute 2016 - present*

Aisha Hasan ('18), *Summer Research Institute 2016*

Tayyaba Jabeen ('16), *senior thesis, 2015-2016*

Archana Nagarajan ('17), *Spring 2016*

Publications

1. Silkworth WT, Kunes KL, Nickel GC, Phillips, ML, Quinlan ME, **Vizcarra CL**. (2018) *The Neuron Specific Formin Delphilin Nucleates but Does Not Enhance Actin Filament Elongation.* Mol Biol Cell, 29: 610.

2. **Vizcarra CL** and Quinlan ME. (2017) *Actin filament assembly by bacterial factors VopL/F: Which end is up?* J Cell Biol 216: 1211.

3. AhYoung AP, Koehl A, **Vizcarra CL**, Cascio D, Egea PF. (2016) *Structure of a putative ClpS N-end rule adaptorprotein from the malaria pathogen Plasmodium falciparum.* Protein Sci 25: 689.

4. Oztug Durer ZA, McGillivary RM, Kang H, Elam WA, **Vizcarra CL**, Hanein D, De La Cruz EM, Reisler E, Quinlan ME. (2015) *Metavinculin tunes the flexibility and the architecture of vinculin-induced bundles of actin filaments.*, J Mol Biol 427: 2782.

5. **Vizcarra CL**, Bor B, and Quinlan ME (2014). *The role of formin tails in actin nucleation, processive elongation, and filament bundling*, J Biol Chem 289: 30602.

6. Roth-Johnson EA, **Vizcarra CL**, Bois JS, and Quinlan ME (2013). *Interaction between microtubules and the Drosophila formin Cappuccino and its effect on actin assembly*, J Biol Chem 289: 4395.

7. Bor B, **Vizcarra CL**, Phillips ML, and Quinlan ME (2012). *Autoinhibition of the formin Cappuccino in the absence of canonical autoinhibitory domains*, Mol Biol Cell 23: 3801.

8. Chen MM, Snow CD, **Vizcarra CL**, Mayo SL, and Arnold FH (2012). *Comparison of random mutagenesis and semi-rational designed libraries for improved cytochrome P450 BM3- catalyzed hydroxylation of small alkanes*, Protein Eng Des Sel 25: 171.

9. **Vizcarra CL***, Kreutz B*, Rodal AA, Toms AV, Lu J, Zheng W, Quinlan ME, and Eck MJ (2011). *Structure and function of the interacting domains of Spire and Fmn-family formins*, Proc Natl Acad Sci USA 108: 11884.
***Co-first authors**

10. **Vizcarra CL**, Zhang N, Marshall SA, Wingreen N, Zeng C, and Mayo SL (2008). *An improved pairwise decomposable finite difference Poisson-Boltzmann method for computational protein design*, J Comp Chem 29: 1153.

11. Treynor TP, **Vizcarra CL**, Nedelcu D, and Mayo SL (2007). *Computationally designed libraries of fluorescent proteins evaluated by preservation and diversity of function*, Proc Natl Acad Sci USA 104: 48.

12. Marshall SA, **Vizcarra CL**, and Mayo SL (2005). *One- and two-body decomposable Poisson- Boltzmann methods for protein design calculations*, Protein Sci 14: 1293.

13. **Vizcarra CL** and Mayo SL (2005). *Electrostatics in Computational Protein Design*, Curr Opin Chem Biol 9: 622.

Selected Presentations

Vizcarra CL *Cytoskeletal regulation by formins: mechanistic insights and drug targeting*, Department of Chemistry, St. John's University, Queens, NY, December 2018 (invited talk).

Vizcarra CL *Cytoskeletal regulation by formins: mechanistic insights and drug targeting*, Department of Biology, Reed College, Portland, OR, November 2018 (invited talk).

Costeas CC, Montero A, Jabeen T and Vizcarra CL. *Molecular mechanisms underlying formin associated inherited deafness*, Gordon Conference on Auditory Systems, Smithfield, RI July 2018. (poster and talk)

Costeas CC, Montero A, Jabeen T and Vizcarra CL. *Molecular mechanisms underlying formin associated inherited deafness*, American Society for Cell Biology Annual Meeting, Philadelphia, PA December 2017. (poster)

Vizcarra CL and Quinlan ME. *Single actin filament imaging studies of the Drosophila formin Cappuccino*, American Society for Cell Biology Annual Meeting, San Fransisco, CA, December 2012. (poster)

Vizcarra CL *Functional studies of the actin regulators Cappuccino and Spire*, Department of Chemistry, Carleton College, Northfield, MN, November 2011. (invited talk)

Vizcarra CL, Bor B, Roth EA, Leettola C, Shur A, and Quinlan ME. *The role of the Cappuccino tail in actin assembly*, Gordon Conference on Motile and Contractile Systems, New London, NH, August 2011. (poster)

Vizcarra CL *Methods development for computational protein design*, Department of Chemistry, California State Polytechnic University, Pomona, CA, May 2009. (invited talk for ADVANCE speaker program)

Vizcarra CL, Tan FE, and Mayo SL. *Applying the Poisson-Boltzmann model to the optimization of surface electrostatics*, American Chemical Society Annual Meeting, San Francisco, CA, September 2006. (talk)