

Mariana P. Torrente (née Plazas-Mayorca)

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EDUCATION

Ph.D. in Chemistry, March 2010. Princeton University. Princeton, NJ.
Certificate in Health and Health Policy, Woodrow Wilson School of Public and International Affairs.

Master of Arts in Chemistry, March 2007. Princeton University. Princeton, NJ.

Bachelors of Science in Biochemistry and Chemistry, May 2005. Florida Institute of Technology.
Melbourne, FL. *Summa Cum Laude.*

POSITIONS

**Assistant Professor, Brooklyn College, City University of New York, Department of Chemistry.
Brooklyn, NY.**

- Characterize the role of epigenetics and protein folding in neurodegenerative and psychiatric disease.

**NIH IRACDA PENN-PORT Postdoctoral Fellow, Dept. of Biochemistry and Biophysics. University of
Pennsylvania Perelman School of Medicine, Philadelphia, PA.**

Advisor: Prof. James Shorter (2012-2015)

- Defined small molecule inhibitors for the yeast disaggregase Hsp104 through high-throughput screening.

**NIH NRSA Postdoctoral Fellow, Dept. of Pharmacology. Pennsylvania State Univ. College of Medicine,
Hershey, PA.**

Advisor: Prof. Kent E. Vrana (2010-2012)

- Identified post-translational modifications and novel binding partners for Tryptophan Hydroxylase 2.

Graduate Student, Dept. of Molecular Biology. Princeton University, Princeton, NJ.

Advisor: Prof. Benjamin A. Garcia (2008-2010)

- Comprehensively cataloged chromatin proteins -particularly histones- and their modifications during biologically significant processes through high-end mass spectrometry proteomics.

Advisor: Prof. Hays S. Rye (2005-08)

- Elucidated substrate conformational changes during GroEL/ES-assisted protein folding using mass spectrometry footprinting.

MSRP Intern, Dept. of Biology, Massachusetts Institute of Technology. Cambridge, MA (2004).

Advisor: Prof. Robert T. Sauer

- Characterized mechanisms of protein degradation by ATP-driven chambered protease ClpAP.

**Undergraduate Researcher, Dept. of Chemistry, Florida Institute of Technology. Melbourne, FL (2002-
2005).**

Advisor: Prof. Nasri A. Nesnas

- Synthesized a fish pheromone for the investigation of the effect of chiral centers on pheromone receptors.

TEACHING EXPERIENCE

Brooklyn College, Brooklyn, NY (2015)

CHEM1100 General Chemistry 1

- Led recitations and laboratory sessions, held office hours

Rutgers University, Camden, NJ (2014) Instructor of Record

120:395 Molecular Basis Of Cellular Biochemistry: Concepts And Applications (Spring '14)

- Developed curriculum, designed syllabus, evaluations and lectures, led discussion-based class sessions, held office hours

Delaware County Community College, Media, PA (2013) Instructor of Record

CHE101. Introduction to General Chemistry 1 (Fall '13)

- Designed syllabus, evaluations and lectures; led lectures and laboratory sessions; held office hours

Princeton University, Princeton, NJ (2005-2010) Teaching Assistant

- Led recitations and laboratory sessions, held office hours

MOL504. Cellular Biochemistry (Fall '09)

FRS152. The Chemistry of Magic (Spring '07, '08, '09)

ENV201. Principles of Environmental Studies (Fall '07)

WWS327. Pharmaceutical Research and Health Policy (Fall '06)

RESEARCH FUNDING

Active

National Institutes of Health

1K22NS091314

Torrente (PI)

03/01/2015-09/01/2018

Epigenetics In Neurodegenerative Disease: Targeting Histone Modifications in ALS

The goal of this project is to study the role of epigenetic mechanisms in the origins of amyotrophic lateral sclerosis (ALS). Role: PI

Completed

National Institutes of Health

F32 MH094071

Plazas-Mayorca/Torrente (PI)

04/01/11-08/31/12

Dynamic Control of Tryptophan Hydroxylase 2:Regulating Brain Serotonin Synthesis

The goal of this project was to understand Tryptophan Hydroxylase 2 (TPH2). TPH2 catalyzes the first and rate-limiting step in the transformation of tryptophan into serotonin in the brain. Role: PI

SELECTED HONORS AND AWARDS

University of Pennsylvania, Philadelphia, PA (2012-2015)

IRACDA PENN-PORT Postdoctoral Fellow (2012-2015; K12 GM081259);

SACNAS Travel Scholarship (2013);

FASEB NIGMS Postdoctoral Preparation Institute (2014);

ASCB MAC 9th Annual Junior Faculty/Postdoctoral Fellows Career Development Workshop (2014);

ACS Postdoc to Faculty Workshop (2014)

SACNAS Travel Scholarship (2014, declined)

NIH NINDS Advanced Postdoctoral Career Transition Award to Promote Diversity in Neuroscience Research (2015-2018; 1K22NS091314)

Pennsylvania State University College of Medicine, Hershey, PA (2010-2012)

Ruth L. Kirschstein NRSA Fellowship, National Institutes of Health (2011-2012; F32 MH094071);

Neuroscience Scholar, Society for Neuroscience (2011-2012);

US Human Proteome Organization Travel Award (2012)

SELECTED HONORS AND AWARDS (continued)**Princeton University, Princeton, NJ (2005-2010)**

Hugh Scott Taylor Merit Prize (2005-2009);
 Norman G. and Elizabeth Brink Graduate Fellowship in Chemistry (2006);
 North Jersey ACS Mass Spectrometry Discussion Group Travel Award (2009)

Florida Institute of Technology, Melbourne, FL (2002-2005)

Presidential Scholar (2002-2005);
 Dean's list (2002-2005);
 Distinguished Scholar (2004-2005);
 Outstanding Junior in the Biological Sciences (2004);
 Outstanding Senior in the Biological Sciences (2005);
 Outstanding Senior in the Physical Sciences (2005).

PUBLICATIONS

1. **Torrente, M.P.**, Chuang, E., Noll, M.M., Jackrel, M.E., Go, M.S., and Shorter, J. Mechanistic Insights Into Hsp104 Potentiation. *Journal of Biological Chemistry*, submitted (2015)
2. **Torrente, M.P.**, Castellano, L.M. and Shorter, J. Suramin inhibits Hsp104 ATPase and Disaggregase Activity. *PLoS One*, 9(10): e110115 (2014)
3. **Torrente, M.P.** and Shorter, J. The metazoan protein disaggregase and amyloid depolymerase system: Hsp110, Hsp70, Hsp40, and small heat shock proteins. *Prion*, 7(6), 457-463 (2013)
4. Ouedraogo, Y.P., Huang, L., **Torrente, M.P.**, Proni, G., Chadwick, E., Wehmschulte, R.J., and Nesnas, N. A Direct Stereoselective Preparation of a Fish Pheromone and Application of the Zinc Porphyrin Tweezer Chiroptical Protocol in Its Stereochemical Assignment. *Chirality*, 25(9), 575-581 (2013)
5. Baliban, R. C.; DiMaggio, P. A.; **Plazas-Mayorca, M.D.**; Garcia, B. A.; Floudas, C. A., Identification of modified and unmodified proteins via high-resolution mass spectrometry and mixed-integer linear optimization. *Journal of Proteome Research*, 11(9), 4615-29 (2012)
6. **Torrente, M.P.**, Freeman, W.M., and Vrana, K.V. Proteomic Biomarkers of Alcohol Abuse. *Expert Reviews in Proteomics*, 9(4), 425-36 (2012)
7. **Torrente, M.P.**, Gelenberg, A., and Vrana, K.E. Boosting Serotonin in the Brain: Is it Time to Revamp the Treatment of Depression? *Journal of Psychopharmacology*, 26(5), 629-35 (2012)
8. **Torrente, M.P.**, Zee, B.M.; Young, N.L.; Baliban, R.C; Leroy, G.; Floudas, C.A.; Hake, S.B.; Garcia B.A., Proteomic Interrogation of Human Chromatin. *PLoS One*, 6, (9), e24747 (2011)
9. **Plazas-Mayorca, M.D.** and Vrana, K.E. Proteomic investigation of epigenetics in neuropsychiatric disorders: A missing link between genetics and behavior? *Journal of Proteome Research*, 10 (1), 58–65 (2011)
10. **Plazas-Mayorca, M.D.**, Bloom, J.S., Zeissler, U., LeRoy, G., Young, N.L., DiMaggio, P.A., Krugylak, L., Schneider, R. and Garcia, B.A. Quantitative Proteomics Reveals Direct and Indirect Alterations in the Histone Code Following Methyltransferase Knockdown. *Molecular BioSystems*, (6), 1719-1729 (2010)
11. Baliban, R. C.; DiMaggio, P. A.; **Plazas-Mayorca, M.D.**; Young, N. L.; Garcia, B. A.; Floudas, C. A., A novel approach for untargeted post-translational modification identification using integer linear optimization and tandem mass spectrometry. *Molecular & Cellular Proteomics*, 9, (5), 764-79 (2010)
12. Young, N.L.*; **Plazas-Mayorca, M.D.***; Flaniken, I.Z.[§]; DiMaggio, P. A.; Beltran, A.[§]; Mishra, N.[§]; LeRoy, G.; Floudas, C. A.; Garcia, B.A., Combined top down and bottom up mass spectrometry analysis of high mobility group protein A1a. *Journal of the American Society for Mass Spectrometry*, 21, (6), 960-70 (2010). *These authors contributed equally to this work; [§]Undergraduate co-author(s)

PUBLICATIONS (continued)

13. Young, N.L.; **Plazas-Mayorca, M.D.**; Garcia, B.A. Systems-wide proteomic characterization of combinatorial post-translational modification patterns. *Expert Reviews in Proteomics*, 7, (1), 79 (2010)
14. **Plazas-Mayorca, M.D.**; Zee, B.M.; Young, N.L.; Fingerman, I.M.; LeRoy, G.; Briggs, S.D.; Garcia B.A., One-pot shotgun quantitative mass spectrometry characterization of histones. *Journal of Proteome Research*, 8, (11), 5367-74 (2009).
15. Young, N. L.; DiMaggio, P. A.; **Plazas-Mayorca, M. D.**; Baliban, R. C.; Floudas, C. A.; Garcia, B. A., High-throughput characterization of combinatorial histone codes. *Molecular & Cellular Proteomics*, 8, (10), 2266-84 (2009).
16. Leroy, G.; Weston, J. T. [§]; Zee, B. M.; Young, N. L.; **Plazas-Mayorca, M. D.**; Garcia, B. A., Heterochromatin protein 1 is extensively decorated with histone code-like post-translational modifications. *Molecular & Cellular Proteomics*, 8, (11), 2432-42 (2009).
[§]Undergraduate co-author(s)
17. Leroy, G.; **Plazas-Mayorca, M. D.**; Young, N. L.; Garcia, B. A., Decoding the histone code by quantitative proteomics. *Molecular & Cellular Proteomics*, 8, (8), Supplement 1, S11, (2009)
18. **Plazas-Mayorca, M.D.**, Young, N.L., and Garcia, B.A. Identification of Differentially Expressed Histone Codes Using HILIC and Mass Spectrometry. *American Biotechnology Laboratory*, 27 (2), 10-2 (2009).
19. Young, N.L., **Plazas-Mayorca, M.D.**, and Garcia, B.A. A Method to Separate and Characterize Modified Forms of Histones Using HILIC and Electron Transfer Dissociation-Mass Spectrometry. *American Biotechnology Laboratory*, January 2009, 27 (1), 23-5 (2009).

SELECTED PRESENTATIONS

1. Poster Presentation "Suramin inhibits Hsp104 ATPase and Disaggregase Activity." 2014 American Society for Cell Biology Annual Meeting. Philadelphia, PA (December 2014)
2. Poster Presentation "Suramin inhibits Hsp104 ATPase and Disaggregase Activity." 2014 Biomedical Postdoctoral Research Symposium, University of Pennsylvania. Philadelphia, PA (November 2014)
3. Poster Presentation "Suramin is a Novel Inhibitor of Hsp104, a Protein Disaggregase" 2014 IRACDA Conference. Albuquerque, NM. (June 2014)
4. Poster Presentation "A High-Throughput Inhibitor Screen For The Protein Disaggregase Hsp104, a Novel Therapeutic Target Against Fungi" 2013 Biomedical Postdoctoral Research Symposium. Philadelphia, PA. (November 2013)
5. Poster Presentation "A High-Throughput Inhibitor Screen For The Protein Disaggregase Hsp104, a Novel Therapeutic Target Against Fungi" 2013 SACNAS National Conference. San Antonio, TX. (October 2013)
6. Short Talk/ Poster Presentation "Binding Partners for Tryptophan Hydroxylase 2 Identified through Mass Spectrometry-based Proteomics" 8th Annual Conference of the US Human Proteome Organization. San Francisco, CA (March 2012)
7. Poster Presentation "Progress Towards the Human Chromatome" 57th American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics. Philadelphia, PA (June 2009)
8. Poster Presentation "Efficiency of a bacterial protein degradation machine: ClpAP." 229th American Chemical Society National Meeting. San Diego, CA. (March 2005)

LANGUAGE SKILLS

Fluent in English and Spanish.