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Department of Chemistry
Georgetown University
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Washington DC, 20057

POSITION TITLE

2014-present Assistant Professor (tenure-track)
Department of Chemistry, Georgetown University

EDUCATION

2013 Postdoctoral Fellow, University of California, Berkeley
Field: Single Molecule Biophysics
Advisor: Prof. Carlos Bustamante

2007 Ph.D., The University of Texas Medical Branch, Galveston
Field: Biophysical Chemistry
Advisor: Prof. James C. Lee

2002 Baccalaureate in Science and Philosophy (Biology)
Universidad Peruana Cayetano Heredia – Lima, Peru

PUBLICATIONS

1. England JP, Hao Y, Bai L, Glick V, Hodges HC, Taylor SS, **Maillard RA**.
[Switching of the folding-energy landscape governs the allosteric activation of protein kinase A.](#)
Proc Natl Acad Sci U S A 115 (32): E7478-E7485 (2018)
2. Hao Y, Canavan C, Taylor SS, **Maillard RA**.
[Integrated Method to Attach DNA Handles and Functionally Select Proteins to Study Folding and Protein-Ligand Interactions with Optical Tweezers.](#)
Scientific Reports 7 (1): 10843 (2017)
3. Lanfranco MF, Garate F, Engdahl A, **Maillard RA**.
[Asymmetric Configurations in a Reengineered Homodimer Reveal Multiple Subunit Communication Pathways in Protein Allostery](#)
J Biol Chem. 292: 6086–6093 (2017)
** Editor's Pick
4. **Maillard RA**** , Liu T, Beasley DW, Barrett AD, Hilser V. and Lee JC**.
[A Thermodynamic Mechanism for the Resistance to Antibody Neutralization in Flaviviruses](#)
J. Am. Chem. Soc. 136: 10315-10324 (2014)
** Co-corresponding authors
5. Bustamante CJ, Kaiser CM, **Maillard RA**, Goldman DH, Wilson CA.
[Mechanisms of cellular proteostasis: insights from single-molecule approaches](#)
Annu Rev Biophys. 43: 119-140 (2014)
6. Sen M**, **Maillard RA****, Nyquist K**, Rodriguez-Aliaga P, Pressé S, Martin A, Bustamante C.
[The ClpXP protease unfolds substrates using a constant rate of pulling but different gears](#)
Cell 155 (3): 636-646 (2013)

** Authors contributed equally to this work

Featured article in Cell (same volume) in [ClpX Shifts into High Gear to Unfold Stable Proteins](#)

7. **Maillard RA**, Chistol G, Sen M, Righini M, Tan J, Kaiser CM, Hodges C, Martin A, Bustamante C.
[ClpX\(P\) generates mechanical force to unfold and translocate its protein substrates](#)
Cell 29 (3): 459-469 (2011)
Featured article in Cell (same volume) in [Protease Power Strokes Force Proteins to Unfold](#)
8. Yu S, **Maillard RA**, Gibenko AV, Lee JC.
[The N-terminal capping propensities of the D-helix modulate the allosteric activation of the Escherichia coli cAMP receptor protein](#)
J. Biol. Chem. 287 (47): 39402-39411 (2012)
9. Zhang S, Evgeniy I, **Maillard R**, Gromowski G, Volk D, Schein C, Huang C, Gorenstein D, Lee JC, Barrett AD, Beasley DW.
[Role of BC loop residues in structure, function and antigenicity of the West Nile virus envelope protein receptor-binding domain III](#)
Virology 403 (1): 85-91 (2010)
10. **Maillard RA**, Jordan M, Beasley DW, Barrett AD, Lee JC.
[Long range communication in the envelope protein domain III and its effect on the resistance of West Nile virus to antibody-mediated neutralization](#)
J Biol Chem. 283 (1): 613-622 (2008)
11. Galletto R, Jezewska MJ, **Maillard R** and Bujalowski W.
[The nucleotide-binding site of the Escherichia coli DnaC protein: molecular topography of DnaC protein-nucleotide cofactor complexes](#)
Cell Biochemistry and Biophysics 43 (3): 331-353 (2005)
12. Galletto R, **Maillard R**, Jezewska MJ and Bujalowski W.
[Global conformation of the Escherichia coli replication factor DnaC protein in absence and presence of nucleotide cofactors](#)
Biochemistry 43 (34): 10988-11001 (2004)

EXTRAMURAL FUNDING

National Science Foundation (NSF) (Award #1715572): 08/2017 – 07/2019

Title: Single Molecule Studies to Dissect Allosteric Communication Networks in Protein Kinase A

HONORS and AWARDS

Honors

- 2017 Keystone Symposia Diversity Fellow
- 2017 Early Career Reviewers for MSFC Study Section
- 2017 Selected abstract for oral presentation, Keystone Symposia in Kinases
- 2011 Selected abstract for trainee oral presentation, The Gibbs Conferences in Biothermodynamics
- 2006 Selected Young Protein Scientist Talk, The Protein Society National Meeting
- 2006 Selected abstract for trainee oral presentation, The Gibbs Conferences in Biothermodynamics
- 2005 Who's Who Among Students in American Universities and Colleges

Awards

- 2017 ASCB Visiting Professorship Awardee
- 2017 Early-Career Investigator Travel Award, Keystone Symposia in Kinases
- 2016 Faculty Research and Education Development Awardee from the American Society for Cell Biology
- 2006 Robert A. Welch Award for Excellence in Graduate Research in Chemistry, The University of

- Texas Medical Branch
- 2006 Barbara Bowman Award for Excellence in Basic Research, The University of Texas Medical Branch
- 2006 Travel Award from the Texas/UK Research Council for the Infectious Disease Workshop, UK
- 2005 Ann and John Hamilton Award for Academic Excellence, The University of Texas Medical Branch
- 2002 Travel Award from the UNESCO and the Regional Bureau for Science for Europe to participate at the Molecular Evolution Meeting, Italy

SEMINARS & INVITED ORAL PRESENTATIONS

- 2018 **Keystone Scientific Advisory Annual Meeting**
 'Mechanism of Allosteric Regulation in Protein Kinases: A Single Molecule Approach'
University of Texas, Health Science Center
 'Direct Observation of cAMP-Induced Allosteric Interactions in Protein Kinase A'
Howard University, Chemistry Department
 'How do proteins talk to each other? Insight from Single Molecule Biophysics'
- 2017 **31st Gibbs Conference in Biothermodynamics**
 'How do proteins talk to each other? Insight from Single Molecule Biophysics'
Genentech, San Francisco
 'How do proteins talk to each other? Insight from Single Molecule Biophysics'
University of California, San Diego
 'How do proteins talk to each other? Insight from Single Molecule Biophysics'
Chesapeake Bay Area Single Molecule Biology Meeting
 'Investigating the Conformational Landscape of Protein Kinase A with Optical Tweezers'
University of Maryland, Biophysics Program
 'Investigating the Conformational Landscape of Protein Kinase A with Optical Tweezers'
Yale University, Research Experience for Peruvian Undergraduates
 'How do proteins talk to each other?'
Georgetown University, Biology Department
 'How do proteins talk to each other?'
Keystone Symposia in Kinases
 'Investigating the Conformational Landscape of Protein Kinase A with Optical Tweezers'
- 2016 **1st Annual Meeting of Peruvian Scientists in the US**
 'Direct observation of ligand-induced domain coupling in an allosteric protein complex'
University of California, Berkeley.
 'Direct observation of ligand-induced domain coupling in an allosteric protein complex'
University of Texas Medical Branch, Galveston
 'Single Molecule Analysis of Allosteric Interactions in Protein Kinase A'
Ohio State University, Biophysics Seminar
 'The ClpXP protease unfolds substrates using a constant rate of pulling but different gears'
- 2015 **Chilean Society for Biochemistry & Molecular Biology, Annual Meeting**
 'Coordination Mechanism in the ClpXP protease'
Yale University, Research Experience for Peruvian Undergraduates
 'The ClpXP protease unfolds substrates using a constant rate of pulling but different gears'
- 2014 **Georgetown University, Department of Physics**
 'The ClpXP protease unfolds substrates using a constant rate of pulling but different gears'
NIH – National Heart, Lung and Blood Institute
 'Coordination Mechanism in the ClpXP protease'
Universidad de Chile (Santiago, Chile) School of Pharmacological and Chemical Sciences
 'Mechanism of Force Generation and Subunit Coordination the ATP-Dependent Protease ClpXP'
Georgetown University, Department of Biochemistry and Molecular & Cellular Biology

- 'Unraveling and Threading: How ATP-Dependent Proteases Apply Force to Mechanically Unfold and Translocate Protein Substrates'
- 2013 **The Latin American Protein Society Meeting, Chile**
'Unraveling and Threading: How ATP-Dependent Proteases Apply Force to Mechanically Unfold and Translocate Protein Substrates'
University of Texas Medical Branch, Galveston
'Mechanism of Force Generation and Subunit Coordination the ATP-Dependent Protease ClpXP'
- 2011 **University of California, Berkeley, QB3 Postdoctoral Seminar**
'Mechanical Unfolding and Translocation of Protein Substrates by the AAA+ Molecular Motor ClpXP'
The 25th Gibbs Conference in Biothermodynamics
'Force-Induced Mechanical Unfolding of Protein Substrates by the AAA+ Protease ClpXP'
- 2006 **The 20th Gibbs Conference in Biothermodynamics**
'Biophysical Principles of a Viral Strategy to Evade Neutralization'
The Protein Society Meeting
'Neutralization Resistance of West Nile Virus is Modulated by the Energy of Coupling Among a Network of Residues in the Domain III of the Viral Envelope Protein'
Pediatric Dengue Vaccine Initiative 3rd Research Network Meeting
'Molecular Mechanism of Antibody Neutralization Resistant In West Nile Virus'
- 2005 **Pediatric Dengue Vaccine Initiative 2nd Research Network Meeting**
'Flavivirus neutralization via long-range communication'
- 2004 **The University of Texas Medical Branch, Galveston**
'Structural and Solution Studies on the Interaction of the Domain III of the Envelope Protein from West Nile Virus with Monoclonal Antibodies'

MENTORING EXPERIENCE

Postdoctoral Fellows

Maria Fe Lanfranco, PhD (former)
Fernada Garate, PhD (former)

PhD Students

Jeneffer England (Clare Luce Booth Scholar) (Georgetown – Chemistry, current)
Yuxin Hao (Georgetown – Chemistry, current)
Sahar Foroutannejad (Georgetown – Chemistry, current)
Lihu Bai (Georgetown – Chemistry, current)
Stephen Dokas (Georgetown – Chemistry, current)
Amy Chao (Georgetown – Chemistry, current)

Undergraduate Students

Lydia Good (Georgetown – Biochemistry, current)

Clare Canavan (Clare Luce Booth Scholar) (Georgetown – Biochemistry, former)
Virginia Glick (Georgetown – Biochemistry, former)
Natalia Christian (Howard University – Chemistry, former)
Charlie (Isabelle) Johnson (Georgetown – Biochemistry, former)
Anja Shahu (Hopkins – Chemistry, former)
Luke Powers (Georgetown – Biology, former)
Irina Wang (Georgetown – Biochemistry, former)
Michael Papazian (Georgetown – Biology, former)

Matthew Park (Georgetown – Biological Physics, former)
Stephanie Sojda (REU Summer 2015)
Xiang Jiang (REU Summer 2015)
Ashton Engdahl (REU Summer 2014)

High school Students

Breona Jones (McKinley Technology High school in Washington DC, former)
Kaitlyn Marsh (McKinley Technology High school in Washington DC, former)
Ava Jundanian (Holton Arms in Bethesda MD, former)