

# CURRICULUM VITAE

## **K. Aurelia Ball**

Skidmore College, Chemistry Department  
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## EDUCATION

PhD **University of California, Berkeley**, Biophysics, May 2013

**Prof. Teresa Head-Gordon** – advisor, Bioengineering & Chemistry

Thesis Committee: David Wemmer, Jih-Wei Chu, Berend Smit

[Alzheimer's amyloid- \$\beta\$  and the disordered structural ensemble characterized using molecular dynamics and NMR spectroscopy](#)

BA **Middlebury College**, Physics, *summa cum laude*, departmental honors, May 2007  
French minor, studied abroad at **University of Poitiers, France**, Spring 2006

## POSITIONS HELD

**Assistant Professor of Chemistry, Skidmore College, Saratoga Springs, NY** (August 2016 – present)  
Current research is on intrinsically disordered proteins interactions with folded proteins.

**NIH National Research Service Award Postdoctoral Fellow (F32), University of California, San Francisco, CA** (April 2015 – August 2016)

Fellowship co-mentored by Prof. Matthew Jacobson and Prof. John Gross. Investigating HIV Vif interactions with host proteins using molecular dynamics simulations and NMR spectroscopy.

**Visiting Lecturer, Santa Clara University** (March 2015 – June 2015)

Physics Department

**University of California, San Francisco, CA** (October 2013 – August 2016)

Postdoctoral research conducted with Prof. Matthew Jacobson, UCSF Pharmaceutical Chemistry Chair and former Biophysic Program Chair. Simulated the biophysical effects of ubiquitination on the protein ZAP-70 and investigated how this might be a mechanism of protein kinase regulation. Resulted in one first author publication in *PLoS Computational Biology*.

**Graduate Research Assistant, University of California, Berkeley, CA** (May 2008 – August 2013)

Thesis research conducted with Prof. Teresa Head-Gordon in collaboration with Prof. David Wemmer. Characterized the conformational ensemble of the disordered Alzheimer's protein Amyloid- $\beta$  using molecular dynamics simulations and NMR spectroscopy. Developed new methods for incorporating experimental and simulation data. Compared the conformations of different isoforms of the Amyloid- $\beta$  protein and investigated the biophysical mechanism for their different toxicities. Resulted in 3 first author publications in *The Journal of Physical Chemistry B*, *Biophysical Journal*, and *Biochemistry*.

**Graduate Student Instructor, University of California, Berkeley, CA** (Jan. 2013 – May 2013)

Chemistry Department

**Graduate Student Instructor, University of California, Berkeley, CA** (Aug. 2009 – Dec. 2009)

Bioengineering Department

## FUNDING & HONORS

**External Funding**

**NSF RUI** "Characterization and modulation of SH3 domain binding pathway biophysics" \$364,418 (2019-2022)

**NSF Collaborative RUI** (recommended for funding in May 2017, but did not receive due to collaborator transition to the UK)

**NIH National Research Service Award F32 Postdoctoral Fellowship**, \$52,406 annual (2015-2016)

Molecular Biophysics **NIH training grant**, \$35,517 annual (2007-2010, 2011-2012)

**Internal Funding**

**Skidmore College Summer Collaborative Research Grants** (2 Summer 2017, 2 Summer 2018)  
Student stipends and room & board plus supplies and faculty stipend (Students supported: Elise Tierney '18, Lieza Chan '18, Colin McClure '20, Henry Huang '20).

**Skidmore College Schupf Scholar Program** (1 Summer 2017, 2 Summer 2018, 2 Summer 2019)  
Student stipends and room & board plus supplies and faculty stipend (Students supported: Gabriella Gerlach '19, Kate Johnson '20, Acadia Connor '21, Anna Carhart '22, Rachel Carrock '22).

**Computational resources**

**XSEDE NSF Supercomputing Allocation**, computational time valued at \$1,661 (October 2018-September 2019)

**XSEDE NSF Supercomputing Allocation**, computational time valued at \$8,943 (October 2017-September 2018)

**Honors & Awards**

Invited member of **MERCURY Consortium** for undergraduate computational chemistry (2018-present)

Soroptimist **Founder Region Fellowship Semifinalist** (2012)

**NIIGMS Poster Award Semifinalist** at Biophysical Society Annual Meeting (2012)

**NSF Graduate Student Fellowship Honorable Mention** (2007, 2008, 2009)

**Phi Beta Kappa** honors society as a Junior, top 2% of class, Middlebury College (2006)

**COURSES TAUGHT****Skidmore College**

CH 333, Physical Chemistry II with Lab

CH 332, Physical Chemistry I Lab

CH 343, Experimental Biochemistry Laboratory

CH 125, Principles of Chemistry with Lab

SSP 100, In the lab and on the screen: Selected scientific topics and their portrayal in film

**Santa Clara University**

Physics 32, Physics for Scientists and Engineers II

**Workshops**

MolSSI Coding Workshop at the Mercury Conference, Furman University, Greenville, SC (July 2018)  
Instructor for 2-day workshop on running and analyzing molecular dynamics simulations

Simulations Workshop, California Institute of Technology, Pasadena, CA (June 2015)

Instructor for 3-day Biomolecular Simulations Training Workshop

Biophysics Program, *University of California, Berkeley, CA* (Sept. 2011 – Oct. 2011)

Creator and Instructor for 5-week Introduction to Scripting course for graduate students and postdocs

## SERVICE

### *Institutional*

Leader, **Science Faculty Discussion Group**, Skidmore College (2018 – present)

**Summer Reading Committee**, Skidmore College (2018)

### *Departmental*

**Department Self-Study Committee**, Skidmore College Chemistry Department (2018)

**Tenure-Track Search Committee**, Skidmore College Chemistry Department (2016)

Organizer, **UCSF Pharmaceutical Chemistry Postdoc Seminar Series**, UCSF (2015 – 2016)

Founder & Coordinator, **Biophysics Module Courses**, UC Berkeley (2011 – 2012)

**Committee to improve the Biophysics graduate program**, UC Berkeley (2011)

### *External*

Associate, **The Molecular Sciences Software Institute** (2019-present)

Chair, **Gordon Research Seminar** on Intrinsically Disordered Proteins (July 2014)

### *Outreach*

**Bay Area Science Festival Discovery Days volunteer**, Science & Health Education Partnership, UCSF (November 2015)

**SF STEM Career Day volunteer**, Science & Health Education Partnership, UCSF (March 2016)

Science demonstrations in elementary schools, **Community Resources for Science** (2009-2013)

Mentor for female physics undergraduates, **Society for Women in Physics**, UC Berkeley (2009)

Volunteer with afterschool science program for girls in Oakland, **Girls Inc.** (2008-2009)

## PROFESSIONAL DEVELOPMENT

**Alda Method** lecture & workshop, Union College (2018)

**Inter-Group Relations Orientation** workshop, Skidmore College (2018)

**Teaching for Inclusive Excellence** workshop, Skidmore College (2017)

**Chemistry Inclusive Hiring Training**, Skidmore College (2016)

**Scientific Leadership & Management Skills Course**, UCSF (2016)

**Science Education Journal Club**, UCSF (2015-2016)

**Science Teaching Effectiveness Program** for Upcoming Professors (STEP-UP), UCSF (2015)

Bay Area Postdocs: **Workshop on Scientific Teaching**, San Francisco State University (2014)

**Navigating the NIH Grant Application Process** seminar series, UCSF (2014)

Institute Fellowship at **Summer Institute for Preparing Future Faculty**, UC Berkeley (2013)

Workshop on **Teaching and the Academic Job Search**, UC Berkeley (2012)

Workshop on **How to Teach a Large Course**, UC Berkeley (2012)

**Teaching Techniques** for Bioengineering semester course, UC Berkeley (2009)

**Teaching Conference** for Graduate Student Instructors, UC Berkeley (2009)

## PEER-REVIEWED PUBLICATIONS

(undergraduate student names are underlined)

**K. Aurelia Ball**, Lieza M. Chan, David J. Stanley, Elise Tierney, Sampriti Thapa, Hai Ta, Lily Burton, Jennifer M. Binning, Matthew E. Jacobson, John D. Gross. Conformational dynamics of the HIV Vif protein complex. *Biophysical Journal*, 2019; 116:1432-1445.

**K. Aurelia Ball**, Jeffrey R. Johnson, Mary K. Lewinski, John Guatelli, Erik Verschueren, Nevan J. Krogan, Matthew P. Jacobson. Non-Degradative Ubiquitination of Protein Kinases. *PLoS Computational Biology*, 2016; 12:e1004898.

Sudhir C. Sharma, Tara Armand, **K. Aurelia Ball**, Anna Chen, Jeffrey G. Pelton, David E. Wemmer, Teresa Head-Gordon. A facile method for expression and purification of 15N isotope-labeled human Alzheimer's  $\beta$ -amyloid peptides from *E. coli* for NMR-based structural analysis. *Protein Expression and Purification*, 2015; 116:82-89.

**K. Aurelia Ball**, David E. Wemmer, Teresa Head-Gordon. Comparison of Structure Determination Methods for Intrinsically Disordered Amyloid- $\beta$  Peptides. *The Journal of Physical Chemistry B*, 2014; 118:6405-6416.

Tandis Vazin, **K. Aurelia Ball**, Hui Lu, Hyungju Park, Yasaman Ataeijannati, Teresa Head-Gordon, Muming Poo, David V. Schaffer. Efficient Derivation of Cortical Glutamatergic Neurons from Human Pluripotent Stem Cells: A model System to Study Neurotoxicity in Alzheimer's Disease. *Neurobiology of Disease*, 2014; 62:62-72.

**K. Aurelia Ball**, Aaron H. Phillips, David E. Wemmer, Teresa Head-Gordon. Differences in  $\beta$ -strand Populations of Monomeric A $\beta$ 40 and A $\beta$ 42. *Biophysical Journal*, 2013; 104:2714-2724. *Featured on issue cover.*

**K. Aurelia Ball**, Aaron H. Phillips, Paul S. Nerenberg, Nicolas L. Fawzi, David E. Wemmer, Teresa Head-Gordon. Homogeneous and Heterogeneous Tertiary Structure Ensembles of Amyloid- $\beta$  Peptides. *Biochemistry*, 2011; 50:7612-7628.

Jory Z. Ruscio, Jonathan E. Kohn, **K. Aurelia Ball**, Teresa Head-Gordon. The influence of protein dynamics on the success of computational enzyme design. *Journal of the American Chemical Society*, 2009; 131:14111-14115.

## POSTERS & PRESENTATIONS

63<sup>rd</sup> Annual Meeting of **The Biophysical Society** (Baltimore, MD), Mar. 2-6, 2017. *Speaker.*

**Gordon Research Conference: Intrinsically Disordered Proteins** (Les Diablerets, Switzerland), July 1-5, 2018. *Poster presenter.*

Conformational Ensembles from Experimental Data and Computer Simulations, **Biophysical Society Thematic Meeting** (Berlin, Germany), August 26, 2017. *Poster presenter.*

61<sup>st</sup> Annual Meeting of **The Biophysical Society** (New Orleans, LA), Feb. 11-15, 2017. *Poster presenter.*

**American Chemical Society**, Symposium on Intrinsically Disordered Proteins: Structure, Function & Interactions (Philadelphia, PA), Aug. 21-25, 2016. *Speaker.*

**Gordon Research Conference: Intrinsically Disordered Proteins** (Les Diablerets, Switzerland), June 25-30, 2016. *Poster presenter.*

60<sup>th</sup> Annual Meeting of **The Biophysical Society** (Los Angeles, CA), Feb. 22 - Mar. 2, 2016. *Poster presenter.*

**HARC Mini-Symposium**, UCSF HARC Center (San Francisco, CA), Oct. 26, 2015. *Speaker.*

**EMBO:** Ubiquitin and ubiquitin-like modifiers: From molecular mechanisms to human diseases (Cavtat, Croatia), Sept. 18-22, 2015. *Poster presenter.*

**American Chemical Society,** Session on Modeling of Protein Kinases and Phosphorylation: Protein Dynamics, Regulation, Function and Signal Transduction (San Francisco, CA), Aug. 10-14, 2014. *Speaker.*

**NIH Annual meeting on Structural Biology related to HIV/AIDS** (Bethesda, MD), June 19-20, 2014. *Poster presenter.*

**Gordon Research Conference:** Intrinsically Disordered Proteins (Stonehill, MA), July 6-11, 2014. *Poster presenter.*

**Mini Stat Mech Meeting** (Berkeley, CA), Jan. 11-13, 2013. *Poster presenter.*

**Gordon Research Conference:** Intrinsically Disordered Proteins (West Dover, VT), July 8-13, 2012. *Poster presenter.*

56<sup>th</sup> Annual Meeting of **The Biophysical Society** (San Diego, CA), Feb. 25-29, 2012. *Poster presenter.*

**Mini Stat Mech Meeting** (Berkeley, CA), Jan. 13-15, 2012. *Poster presenter.*

**Gordon Research Conference:** Intrinsically Disordered Proteins (Davidson, NC), July 11-16, 2010. *Poster presenter.*

54<sup>th</sup> Annual Meeting of **The Biophysical Society** (San Francisco, CA), Feb. 20-24, 2010. *Poster presenter.*

**Gordon Research Seminar:** Protein Folding Dynamics (Ventura, CA), Jan. 9-10, 2010. *Speaker.*

**Gordon Research Conference:** Protein Folding Dynamics (Ventura, CA), Jan. 10-15, 2010. *Poster presenter.*