

## JEANNE A. HARDY, PH.D.

Professor of Chemistry  
University of Massachusetts Amherst  
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### RESEARCH INTERESTS

Biological chemistry and x-ray crystallography of biomedically important proteases. Design of novel drug-like compounds. Identification, mechanistic studies and exploitation of allosteric sites and exosites in protease drug targets.

### EDUCATION

Ph.D. Biochemistry and Molecular Biology, May 2000 *Advisor:* Hillary Nelson  
University of California at Berkeley, Berkeley, CA  
*Dissertation Title:* Role of an  $\alpha$ -Helical Bulge and Kink in the Heat Shock Transcription Factor

B.S. Chemistry/ M.S. Biochemistry, Cum Laude 1994 *Advisor:* Ann Aust  
Utah State University, Logan, UT  
*Thesis Title:* Effect of Iron Binding on the Ability of Crocidolite to Cause DNA Single-Strand Breaks

### PROFESSIONAL EXPERIENCE

2018-Present Professor, Department of Chemistry  
2017-Present Director the NIH T32 Biotechnology Training Program  
2015-Present Associate Director Models to Medicine Center of the Institute for Applied Life Science  
2007-Present Adjunct Professor, Department of Biochemistry & Molecular Biology  
2005-Present Faculty Member, Chemistry-Biology Interface Training Program  
2005-Present Faculty Member, Molecular & Cellular Biology Graduate Program  
2012-2018 Associate Professor with tenure, Department of Chemistry  
2015-2017 Co-director the NIH T32 Biotechnology Training Program  
2006-2015 Faculty Member, Institute for Cellular Engineering  
2005-2012 Assistant Professor, Department of Chemistry  
*University of Massachusetts Amherst, Amherst, MA*  
2014 Visiting Researcher & Fulbright Fellow, Dept. of Structural Biology & Chemistry  
*Institute Pasteur, Paris FRANCE*  
2013-2014 Visiting Associate Professor, Department of Neuropathology & Neuroscience  
*University of Tokyo, Tokyo, JAPAN*  
2001-2005 NIH Post-doctoral Fellow *Advisor:* James Wells  
*Sunesis Pharmaceuticals, South San Francisco, CA*  
2000-2001 Japan Society for Promotion of Science Post-Doctoral Fellow *Advisor:* Masasuke Yoshida  
*Tokyo Institute of Technology, Yokohama Japan*

### HONORS and DISTINCTIONS

Mahoney Life Sciences Prize, 2018  
Fulbright Scholar - Pasteur Institute; Paris, France, 2014  
Editorial Board of Frontiers in Cell Death and Survival, 2014-Present  
Editorial Board Biochemical Journal, 2010-present  
Chancellor's Junior Fellows, 2009-2012  
Lilly Teaching Fellowship, 2009-2010  
The Cottrell Scholar Award, 2008-2011  
The Beckman Young Investigator Award, 2006-2009  
The Smith Family New Investigator Award, 2005-2007  
NIH Post-doctoral Fellowship (3-year Individual NRSA), 2002-2005

Japan Society for the Promotion of Science Post-doctoral Fellowship, 2000-2001  
 Regents Fellowship, University of California at Berkeley, 1995-1996  
 Outstanding Graduate Student Instructor Award, University of California at Berkeley, 1995-1996  
 International Institute of Chemists Student Awardee, 1993  
 Utah State University Presidential Scholar, Utah State University, 1989-1993  
 National Elks Foundation Scholar, 1989-1993

## CURRENT FUNDING

<i>Description</i>	<i>Role</i>	<i>Dates</i>	<i>Direct Amount</i>
NIH R01 GM080532-09 <i>Title: Control of Executioner Caspases with an Allosteric Switch</i> J. Hardy, PI	PI	8/15/14 - 8/14/19	\$716,000
NIH T32 GM108556 <i>Title: UMass Training Program in Biotechnology</i> J. Hardy, PI; S. Peyton, co-I	co-I	7/1/15 - 6/30/20	\$783,378
NSF CBET 1511367 <i>Title: A Novel Cell Selection System Using Evolved, Natural-Product Responsive Caspases</i> J. Hardy, PI; S. Roberts (WPI), co-PI	PI	8/15/15- 9/30/18	\$480,520
IALS Seed Grant <i>Title: Furoxan-based Caspase-6 Inhibitors for Treatment of Neurodegeneration</i> J. Hardy, PI	PI	8/1/2016- 7/31/2018	\$50,000
UMASS-Chemical Screening Initiative Tier II Grant <i>Title: Unbiased discovery of inhibitors of Zika virus NS2B-NS3 protease for the treatment of Zika infections</i> J. Hardy, PI	PI	8/12/2016- 8/11/2018	\$22,500

## PENDING FUNDING

<i>Description</i>	<i>Role</i>	<i>Dates</i>	<i>Direct Amount</i>
NIH R01 GM080532-10 <i>Title: Control of Executioner Caspases with an Allosteric Switch</i> J. Hardy, PI	PI	8/15/18- 8/15/23	\$1,250,000
DoD MURI 72937-LS-MUR <i>Title: Controlling Protein Function Using Dynamic Chemical Switches to Modulate Structure</i> J. Hardy, PI; S. Thayumanavan, J. Chen, S. Blanchard, A. (Cornell Med.), Chatterjee (Boston College), co-PIs  *One of three white papers selected for full proposal submission. Awaiting funding decision.	PI	6/1/2018- 5/31/2023	\$6,250,000
NIH R01 R01 CA212286 <i>Title: Intracellular caspase-3 therapy with tumor-targeted bacteria</i> N. Forbes, PI; J. Hardy, funded collaborator  *Scored in 13 <sup>th</sup> percentile. Awaiting funding decision.	Collab- orator	4/1/18 - 3/31/23	\$1,250,000

## COMPLETED FUNDING

<i>Description</i>	<i>Role</i>	<i>Dates</i>	<i>Direct Amount</i>
NIH R01 GM080532 <i>Title: Control of Executioner Caspases with an Allosteric Switch</i> J. Hardy, PI	PI	7/1/08 - 8/14/14	\$825,000
Manning Inventor Fellowship for Post-doctoral Fellow <i>Title: Development of a new class of caspase-6 inhibitors</i> J. Hardy, PI; N. Meka, PD Fellow	PD Advisor	8/8/2015- 8/7/2016	\$50,000
NIH R03 DA035189 <i>Title: Caspase-6 allosteric inhibitors: activity probes and neurodegeneration treatments</i> J. Hardy, PI	PI	8/1/12- 7/31/14	\$50,000
Armstrong Fund for Science <i>Title: Validating a New Allosteric Site in Caspase-6 for Alzheimer's Disease Treatment</i> J. Hardy, PI	PI	5/1/13- 6/30/15	\$30,000
National Science Foundation DGE-065412 <i>Title: Integrative Graduate Education and Research Traineeship in Cellular Engineering</i> S. Roberts, PI, S. Bhatia, J. Hardy, J. Normanly, S. Peterson, co-PIs	co-PI	8/15/07 - 7/31/14	\$2.82M
Research Corporation Cottrell Scholar Award <i>Title: Designing Allosteric Switches in Phosphatases</i> J. Hardy, PI	PI	5/6/08 - 6/1/12	\$100,000
Center of Excellence in Apoptosis Research <i>Title: Building an apoptosis-reporting mouse</i> J. Hardy, Lead PI and K. Tremblay co-PI (All funds used to support the work of one joint Post-Doctoral Fellow with a principal appointment in Hardy Lab.)	PI	10/1/09- 9/30/11	\$120,000
Center of Excellence in Apoptosis Research <i>Title: Development of a Real-Time Indicator of Apoptosis in Zebrafish</i> G. Downes, Lead PI and J. Hardy co-PI (All funds used to support the work of one joint Research Fellow with a principle appointment in Downes Lab.)	co-PI	9/1/10- 8/31/11	\$26,000
Arnold and Mabel Beckman Foundation <i>Title: Development of an Allosteric Trigger in Caspase-7</i> J. Hardy, PI	PI	9/1/06 - 8/30/10	\$264,000
The Medical Foundation-Smith Family New Investigator Award <i>Title: Designing Allosteric Switches in Caspases</i> J. Hardy, PI	PI	12/1/05 - 9/1/08	\$190,000
American Cancer Society Institutional Research Grant <i>Title: Mechanism of Caspase-6 Activation and Inhibition</i> J. Hardy, PI	PI	5/1/07- 4/30/08	\$30,000
NSM Deans Excellence Initiative <i>Title: Proton Exchange Membranes from Engineered M2</i>	PI	12/1/07 - 6/30/08	\$50,000 (\$16,700 Hardy)

J. Hardy, PI. S. Thayumanavan, L. Thompson, co-PIs			Portion)
National Science Foundation CHE-0739227 <i>Title: Center for Chemical Innovation: Fueling the Future</i> S. Thayumanavan, PI., S. Auerbach, J. Hardy, M. Johnson, D. Venketraman, co-PIs	co-PI	8/15/07 - 8/14/10	\$1.5M (\$66,800 Hardy Portion)
Mellon Foundation Mutual Mentoring Grant <i>Title: Life Sciences Women Faculty</i> L. Thompson Lead PI and J. Hardy co-PI	co-PI	7/1/09- 7/0/10	\$8,800

**REFEREED PUBLICATIONS** - Hardy as corresponding author underlined. Undergraduate authors\*.

*From work at University of Massachusetts*

1. Jeanne A. Hardy (2018). "Fighting Kinase Resistance with Caspase Activators." **Cell Chemical Biology**. Volume 25, Issue 8, 16 August 2018, Pages 927-928.
2. Maureen Hill, Muslum Yildiz, Yunlong Zhao and Jeanne A. Hardy (2018). "Conformational rearrangement of NS2B region is critical for catalytic activity of dengue virus NS2B-NS3 protease." **ACS Chemical Biology**. DOI: 10.1021/acscchembio.8b00508.
3. Kristen L. Huber\*, Banyuhay P. Serrano\* and Jeanne A. Hardy (2018). "Caspase-9 CARD: Core Domain interactions require a properly-formed active site." **Biochemical Journal**. 475(6):1177-1196.
4. Agne Tubeleviciute-Aydin, Libin Zhou, Gyanesh Sharma, Ishankumar V. Soni, Sergey N. Savinov, Jeanne A. Hardy and Andrea C. LeBlanc (2018) "Rare human Caspase-6-R65W and Caspase-6-G66R variants identify a novel regulatory region of Caspase-6 activity." **Scientific Reports**. 8, Article number: 4428.
5. Scott J. Eron, Derek J. MacPherson, Kevin Dagbay and Jeanne A. Hardy (2018). "Zinc-mediated inhibition of the apoptotic caspases -3, -6, -7, & -8." **ACS Chemical Biology**. 13(5), 1279-1290.
6. Banyuhay P. Serrano and Jeanne A. Hardy (2018) "Phosphorylation by Protein Kinase A Disassembles the Caspase-9 Core Promoting Formation of Ordered Aggregates." **Cell Death and Differentiation**. DOI:10.1038/s41418-017-0052-9.
7. Celia Homyak, Ann Fernandez, Mollie Touve, Bo Zhao, Francesca Anson, Jeanne Hardy, Richard Vachet, Nathan Gianneschi, Jennifer Ross, Sankran Thayumanavan (2017) "Lipogels for Encapsulation of Hydrophilic Proteins and Hydrophobic Small Molecules" **Biomacromolecules**. 19(1):132-140.
8. Banyuhay P. Serrano, Hannah S. Szydlo, Dominique Alfandari and Jeanne A. Hardy (2017) "Active-site Adjacent Phosphorylation at Tyr-397 by c-Abl Kinase Inactivates Caspase-9." **Journal of Biological Chemistry**. 292(52):21352-21365.
9. Kishore Raghupathi, Scott J. Eron, Francesca Anson, Jeanne A. Hardy, Sankaran Thayumanavan (2017) "Utilizing Inverse Emulsion Polymerization to Generate Responsive Nanogels for Cytosolic Protein Delivery." **Molecular Pharmaceutics**. 14(12):4515-4524.
10. Kevin B. Dagbay and Jeanne A. Hardy (2017) "Multiple proteolytic events in caspase-6 self activation impact conformations of discrete structural regions" **Proceedings of the National Academy of Science, USA**. 114(30): E7977-86.
11. Kevin B. Dagbay, Maureen Hill, Elizabeth Barrett\* and Jeanne A. Hardy (2017) "Tumor-Associated Mutations in Caspase-6 Negatively Impact Catalytic Efficiency" **Biochemistry** 56(34):4568-77.
12. Kevin B. Dagbay, Nicolas Bolik-Coulon, Sergey N. Savinov and Jeanne A. Hardy (2017). "Caspase-6 Undergoes a Distinct Helix-Strand Interconversion Upon Substrate Binding" **Journal of Biological Chemistry**. 292: 4885-4897.

13. Scott J. Eron, Kishore Raghupathi and Jeanne A. Hardy, (2017). "Dual Site Phosphorylation of Caspase-7 by PAK2 Blocks Apoptotic Activity by Two Distinct Mechanisms." **Structure** (Cell Press). 25 (1): 27–39.
14. Jeanne A. Hardy and Lynmarie Thompson (2017). "Mutual Mentoring to Promote Success and Satisfaction of Women Faculty in STEM." Educational and Outreach Projects from the Cottrell Scholars Collaborative: Professional Development and Outreach **ACS Books**. Volume 1259 <http://pubs.acs.org/isbn/9780841232426>.
15. Maureen E. Hill, Derek J. MacPherson, Peng Wu, Olivier Julien, James A. Wells, Jeanne A. Hardy, (2016). "Reprogramming Caspase-7 specificity to Caspase-6 by regio-specific mutations and selection" **ACS Chemical Biology**. 11(6):1603–1612.
16. Yaning Wu, Jeannine Garnett, Dongbin Xu, Elsa R. Flores, Yunlong Zhao, Jeanne A. Hardy, Andreas Bergmann, (2015). "Genetic characterization of two gain-of-function alleles of the effector caspase DrICE in *Drosophila*" **Cell Death and Differentiation**. 23(4):723-32.
17. Judy Ventura, Scott J Eron, Daniella C González-Toro, Kishore Raghupathi, Fei Wang, Jeanne A. Hardy, Sankaran Thayumanavan, (2015). "Reactive Self-Assembly of Polymers and Proteins to Reversibly Silence a Killer Protein." **Biomacromolecules**. 16(10):3161-71.
18. Chang Soo Kim, Rubul Mout, Yunlong Zhao, Yi-Cheun Yeh, Rui Tang, Youngdo Jeong, Bradley Duncan, Jeanne A. Hardy and Vincent M. Rotello, (2015). "Co-Delivery of Protein and Small Molecule Therapeutics Using Nanoparticle-Stabilized Nanocapsules." **Bioconjug Chem**. 26 (5): 950–954.
19. Kevin Dagbay, Scott J. Eron, Banyuhay P. Serrano, Yunlong Zhao, Elih M. Velázquez-Delgado, Di Lin\* and Jeanne A. Hardy, (2014). A multi-pronged approach for compiling a global map of allosteric regulation in the apoptotic caspases. In Avi Ashkenazi, Junying Yuan, Jim Wells, editors: Regulated Cell Death Part A, **Methods in Enzymology**, UK: Academic Press, 544: 215-249.
20. Muslum Yildiz, Sumana Ghosh, Jeffrey A. Bell, Woody Sherman and Jeanne A. Hardy, (2013). "Allosteric inhibition of the NS2B-NS3 protease from dengue virus" **ACS Chemical Biology**. 8 (12): 2744–2752.
21. Rui Tang, David J. Solfiell, Subinoy Rana, Chang Soo Kim, Rubul Mout, Elih M. Velázquez-Delgado, Apiwat Chompoosor, Zheng-Jiang Zhu, Chaekyu Kim, Bo Yan, Youngdo Jeong, Jeanne A. Hardy and Vincent M. Rotello, (2013). "Direct Delivery of Functional Proteins and Enzymes to the Cytosol Using Nanoparticle-Stabilized Nanocapsules." **ACS Nano**. 7 (8): 6667–6673.
22. Peng Wu, Samantha Nicholls and Jeanne A. Hardy, (2013). A tunable, modular approach to fluorescent protease-activated reporters. **Biophysical Journal**. 104(7):1605-14.
23. Samantha Nicholls and Jeanne A. Hardy, (2013). "Structural Basis of Fluorescence Quenching in Caspase Activatable-GFP." **Protein Science**. 22(3), 247. *Article featured as cover illustration.*
24. Elih M. Velazquez-Delgado and Jeanne A. Hardy, 2012. "Zinc-Mediated Allosteric Inhibition of Caspase-6." **Journal of Biological Chemistry**. 287(43), 36000.
25. Kristen L. Huber, Sumana Ghosh, and Jeanne A. Hardy, (2012). "Inhibition of caspase-9 by stabilized peptides targeting the dimerization interface." **Peptide Science**. 98(5), 451–465.
26. Kristen L. Huber and Jeanne A. Hardy, (2012). "Mechanism of zinc-mediated inhibition of caspase-9." **Protein Science**. 21,1056-1065. *Article featured as cover illustration.*

*Publications Prior to Tenure (Awarded June 12, 2012)*

27. Velazquez-Delgado, Elih M. and Hardy, Jeanne A., (2012). "Phosphorylation regulates assembly of the caspase-6 substrate-binding groove." **Structure**. 20, 742–751. *Article featured with a Preview.*

28. Abeer M. Jabaiah, Jennifer A. Getz, Witold A. Witkowski, Jeanne A. Hardy, Patrick S. Daugherty, (2012). Identification of protease exosite-interacting peptides that enhance substrate cleavage kinetics. **Biological Chemistry**. 393(9): 933-41.
29. Gustavo E. López, Inara Colón-Díaz, Anthony Cruz, Sumana Ghosh, Samantha B. Nicholls, Usha Viswanathan, Jeanne A. Hardy, and Scott M. Auerbach, (2012). Modeling non-aqueous proton wires tethered to helical peptides: Biased proton transfer driven by helical dipoles. **The Journal of Physical Chemistry A**. 116(4):1283-8.
30. Filip Jagodzinski, Jeanne A. Hardy and Ileana Streinu, (2011). "Using Rigidity Analysis To Probe Mutation-Induced Structural Changes in Proteins." Proceedings, Bioinformatics and Biomedicine Workshops (BIBMW), 2011 IEEE International Conference (BIBM), Atlanta, USA, 2011; 432-437.
31. Witold Witkowski and Jeanne A. Hardy, (2011). "A designed redox-controlled caspase." **Protein Science**, 20, 1421-1431. *Article featured as cover illustration.*
32. Samantha Nicholls, Jun Chu, Genevieve Abbruzzese, Kimberly D. Tremblay and Jeanne A. Hardy, (2011). "Mechanism of a dark-to-bright reporter of caspase activity." **Journal of Biological Chemistry**, 286 (28), 24977-24986.
33. Sravanti Vaidya, and Jeanne A. Hardy, (2011). "Caspase-6 latent state stability relies on helical propensity." **Biochemistry** 50(16), 3282-7.
34. Sravanti Vaidya, Elih M. Velazquez-Delgado, Genevieve Abbruzzese and Jeanne A. Hardy, (2011). "Substrate-Induced Conformational Changes Occur in All Cleaved Forms of Caspase-6." **Journal of Molecular Biology**, 406, 75-91. *Article featured as cover illustration.*
35. Witold Witkowski and Jeanne A. Hardy, (2009). "L2' loop is critical for caspase-7 active-site formation." **Protein Science**, 18, 1459-1468. *Article featured as cover illustration.*
36. Kristen L. Huber, Kevin D. Olsen\* and Jeanne A. Hardy, (2009). "Robust Production of a Peptide Library using Methodological Synchronization." **Protein Expression and Purification**, 67, 139-147.
37. Jeanne A. Hardy, (2007). "A Link Means a Lot: Disulfide Tethering in Structure-Based Drug Design" in **Computational Approaches to Structure Based Drug Design**, publishers Royal Society of Chemistry, p. 318-347.
38. Jeanne A. Hardy, (2006). "Discovery and exploitation of allosteric sites for control of protein function." **Nanomedicine**, 2(4), 291.

*From work prior to University of Massachusetts*

39. Jeanne A. Hardy and James A. Wells, (2009). "Dissecting an Allosteric Switch in Caspase-7 using Chemical and Mutational Probes." **Journal of Biological Chemistry**, 284(38), 26063-9.
40. Jeanne A. Hardy and James A. Wells, (2004). "Searching for Allosteric Sites in Enzymes." **Current Opinion in Structural Biology**, 14(6), 706-715.
41. Jeanne A. Hardy, Joni Lam, Jack T. Nguyen, Thomas O'Brien, and James A. Wells, (2004). "Discovery of an allosteric site in caspases." **Proceedings of the National Academy of Science USA**, 101(34), 12461-6.
42. Marco P. Cicero, Susan T. Hubl, Celia J. Harrison, Otis Littlefield, Jeanne A. Hardy, Hillary C.M. Nelson, (2001). "The wing in yeast heat shock transcription factor (HSF) DNA-binding domain is required for full activity." **Nucleic Acids Research**, 29(8), 1715-23.
43. Jeanne A. Hardy and Hillary C.M. Nelson, (2000). "Proline in an  $\alpha$ -helical kink is required for folding kinetics but not for kinked structure, function or stability of heat shock transcription factor." **Protein Science**, 9(11), 2128-2141.
44. Jeanne A. Hardy, Scott T.R. Walsh, and Hillary C.M. Nelson, (2000). "Role of an  $\alpha$ -Helical Bulge in the Yeast Heat Shock Transcription Factor." **Journal of Molecular Biology**, 295(3), 393-409.

45. Andrew J. Werner, Michael F. Hochella, George D. Guthrie, Jeanne A. Hardy, Ann E. Aust, J. Donald Rimstidt, (1995). "Asbestiform reibeckite (crocidolite) dissolution in the presence of Fe-chelators: Implications for mineral-induced disease." ***American Mineralogist***, 80 (11),1093.
46. Jeanne A. Hardy and Ann E. Aust, (1995). "Iron in Asbestos Chemistry and Carcinogenicity." ***Chemical Reviews***, 95, 97-118.
47. Jeanne A. Hardy and Ann E. Aust, (1995). "The Effect of Iron Binding on the Ability of Crocidolite Asbestos to Catalyze DNA Single-Strand Breaks." ***Carcinogenesis***, 16(2), 319-325.

## MANUSCRIPTS SUBMITTED

1. Maureen E. Hill, Anil Kumar, James A. Wells, Tom C. Hobman, Jeanne A. Hardy, and Olivier Julien "Enhanced catalytic properties of Zika virus NS2B-NS3 protease enable cleavage of human host substrates during infection. *Manuscript under review at ACS Chemical Biology*.

## MANUSCRIPTS IN PREPARATION

1. Derek J. MacPherson, Caitlyn Mills, Mary Jo Ondrechen and Jeanne A. Hardy "N-terminal tri-arginine patch recruits for substrates for caspase-6 hydrolysis via exosite interactions" *Manuscript in preparation*.
2. Eric Okerberg, Jennie Green, Tyzoon Nomanbhoy, Kevin Dagbay, Ishankumar V. Soni, Sergey Savinov, Jeanne Hardy and John Kozarich. "The Dimer Interface of Procaspase-6 Defines a Nucleotide Binding Site." *Manuscript in preparation*.
3. Penchala Narasimharao Meka, Kevin B. Dagbay, Elih M. Velazquez-Delgado, Derek J. MacPherson, Ishankumar V. Soni, Yifei Pei, and Jeanne A. Hardy "Discovery of potent and selective inhibitors of caspase-6." *Manuscript in preparation*.
4. Jorge Luis Arias Arias, Maureen Hill, Derek J. MacPherson, Jeanne A. Hardy and Rodrigo Rodriguez "Real time monitoring of flavivirus infection." *Manuscript in preparation*.

## INTELLECTUAL PROPERTY FILINGS

5. Jeanne A. Hardy and Penchala Narasimharao Meka, Furoxan-Based Compounds and Uses thereof. *To be filed Jan 17<sup>th</sup>, 2018*.
6. Daniel A. Erlanson, Stig K. Hansen, Jeanne A. Hardy, Joni Lam, Thomas O'Brien, April 11, (2003). "Methods for Identifying Allosteric Sites." ***World Patent***, WO 03/087051 A2

## INVITED SEMINARS

### 2018

Proteolytic Enzymes and their Inhibitors Gordon Research Conference, Barga, Italy, Jun. 4  
*"Caspase-6 attains unique conformations at various points during its lifecycle"*

### 2017

10th General Meeting of the International Proteolysis Society - Banff, AB Canada Oct 28-Nov1  
 Keynote Address: CBI/BMB/UMMS Retreat – Worcester, MA May 23  
*"A battle to the death: Diverse molecular mechanisms for caspase regulation by kinases"*

Eindhoven University of Technology (Netherlands) Department of Biomedical Engineering - Dec. 11  
*Engineering apoptotic caspases to discover substrate-binding exosites*

Association for Biochemistry and Molecular Biology (ASBMB) Annual Meeting - Chicago, IL, Apr. 5  
*"Phosphorylation regulates apoptotic caspase function through diverse molecular mechanisms"*

25<sup>th</sup> Annual Enzyme Mechanisms Conference – St. Pete’s Beach, FL, Jan. 4-8

*"Native allosteric regulation of caspase-6"*

## 2016

Protease Inhibitors in Drug Discovery Conference - San Diego, CA, Mar. 2

*"A Directed, Proactive Method for Identifying Protease Exosites for Substrate Binding"*

Association for Biochemistry and Molecular Biology (ASBMB) Annual Meeting - San Diego, CA, Apr. 5

*"Engineered Caspases with Altered Specificities Enable Identification of Exosites"*

Trinity College Department of Chemistry – Hartford, CT, Oct. 7

*"Caspase Structures that Enable a Search for new Alzheimer's Drugs"*

University of Pennsylvania Medical School Raisizz Rounds, Dept. of Biochemistry & Biophysics, Oct 27

*"Caspases and Kinases on the Apoptotic Battlefield"*

## 2015

Protease Inhibitors in Drug Discovery Conference - San Diego, CA, Feb. 26-27

Université de Sherbrooke – Sherbrooke, QC, Jun 1.

*"Identifying and Exploiting of Allosteric Sites in Caspases"*

Merrimack College Department of Chemistry - North Andover, MA, Mar. 2

*"Caspase Structures that Enable a Search for new Alzheimer's Drugs"*

James Wells 65<sup>th</sup> Birthday Symposium - UCSF, CA, Apr. 25

*"Caspases and Kinases on the Apoptotic Battlefield"*

McGill University Department of Neurology & Neurosurgery - Montreal, QC, Jun. 2.

29<sup>th</sup> Annual Symposium of The Protein Society - Barcelona, Spain, July 22-25.

*"Mapping Allosteric Sites Across the Apoptotic Caspases"*

## 2014

Tokyo Metropolitan Inst. of Medical Science – Dept. of Advanced Science for Biomolecules, Jan. 24.

*"Handcuffing the Killers: Conformational control and real-time monitoring of caspase proteolytic activity"*

European Workshop on Cell Death – Paphos, Cyprus, Mar. 31.

*"Allosteric Regulation of Apoptotic Caspases"*

Institute Pasteur – Dept. of Structural Biology & Chemistry, Apr. 28.

*"Handcuffing the Killers: Conformational control of caspase proteolytic activity"*

Institute Pasteur – Dept. of Structural Biology & Chemistry, July 1

*"Discovering and Exploiting Allosteric sites in Dengue Virus Protease"*

Kings College London – Metal Metabolism Group Zinc Brain Storming Session, July 31

*"Allosteric regulation of caspases by zinc"*

International Society for Zinc Biology – Asilomar, CA, Sept. 15

*"Allosteric Regulation of Apoptotic Caspases by Zinc"*

## 2013

Brandeis University – Department of Chemistry, Jan. 28.

University of Massachusetts Molecular & Cellular Biology Retreat, Feb. 23.

Peking University – School of Life Sciences, Mar. 18.

University of Western Ontario – Departments of Chemistry and Biochemistry, Mar. 27.

*"Suicidal Shape Shifters: Conformational Control of Caspases."*

Brookhaven National Laboratory – Brookhaven Women in Science, Apr. 24

University of Tokyo – Graduate School of Pharmaceutical Sciences, Oct. 3



University of Tokyo – Department of Applied Chemistry – School of Engineering, Nov. 26  
Tokyo Institute of Technology – Nagatsuta Campus - Chemical Resources Laboratory, Nov. 29  
*“Handcuffing the Killers: Conformational control and real-time monitoring of caspase proteolytic activity”*

Tokyo Institute of Technology – Ookayama Campus – Department of Computer Science, Nov. 15  
*“Discovering and Exploiting Allosteric sites in Caspases and Dengue Virus Protease”*

University of Western Ontario – School of Arts and Sciences, Mar. 28.  
*“Every Third Thursday: Mutual Mentoring for Women in the STEM Disciplines.”*

## 2012

Quinnipiac University – Department of Chemistry, Nov. 9.  
Symposium on Biomolecular Structure, Dynamics & Function - St. Jude Children’s Hospital, Memphis, TN April 27-29<sup>th</sup>.  
*“Suicidal Shape Shifters: Conformational Control of Caspases.”*

16<sup>th</sup> Annual UMass Food Science Industrial Strategic Research Alliance Meeting. April 12, 2012.  
*“Exploring and Exploiting Allosteric sites on Caspase-6 for Treatment of Alzheimer’s Disease.”*

## 2011

Massachusetts Institute of Technology – Program in Biophysics, April 1.  
Vanderbilt University – Department of Microbiology & Immunology, April 5.  
University of Massachusetts School of Medicine – Department of Biochem. & Mol. Pharmacology, April 13.  
University of Massachusetts Dartmouth –Department of Chemistry, Feb 16.  
North Carolina State University – Department of Molecular & Structural Biochemistry, Sept. 15.  
University of Massachusetts Amherst – Department of Chemistry, Sept. 22  
University of Pennsylvania School of Medicine – Department of Biochemistry & Biophysics, Sept. 29.  
Smith College – Department of Chemistry, Oct. 6.  
New England Young Faculty Symposium, Amherst, MA, Oct. 22.  
*“Suicidal Shape Shifters: Conformational control and monitoring of caspase proteolytic activity.”*

Proteins Gordon Research Conference, Holderness, NH, June 20. Talk selected from abstracts.  
*“Multiple Allosteric Sites Exist in Neurodegenerative Caspase-6.”*

## 2010

University of Utah School of Medicine –Department of Medicinal Chemistry, March 18.  
Brigham Young University–Department of Chemistry & Biochemistry, March 19.  
*“Controlling Caspases Allosterically with Chemical, Mutational & Fluorescent Probes.”*

Proteolytic Enzymes and their Inhibitors Gordon Research Conference, Barga, Italy, May 6. One of two talks selected from abstracts as a “hot talk”.  
*“A Dark to Bright Reporter of Protease Activity”*

## 2009

Aileron Therapeutics, Boston, MA. March 19.  
*“Designing helical peptides as caspase inhibitors and scaffolds for proton transport studies.”*

Pacific Coast Protease Meeting, Warner Springs Ranch, CA. April 19. Invited Keynote Speaker.  
*“Dissecting the Caspase-7 Allosteric Mechanism with Chemical, Mutational & Fluorescent Probes.”*

Research Corporation for Science Advancement Cottrell Scholar Conference, Tucson, AZ, July 10.  
*“Crime Scene Chemistry: The truth & lie behind CSI.”*

Annual Symposium of the Protein Society, Boston MA, July 25. Talk selected from abstracts.  
*“A Dark to Bright Reporter of Proteolytic Activity.”*

Beckman Young Investigators Symposium, Irvine CA, Aug 9.  
University of Massachusetts Amherst – Department of Vet & Animal Science. May 6.  
*“Controlling Caspases Allosterically with Chemical, Mutational & Fluorescent Probes.”*

## 2008

Health & Diseases: Discoveries and Treatments Symposium, UMass Alumni Weekend, Jun. 7.  
*"Chemical Genetics for Drug Target Validation."*

Center for UMass-Industry Research on Polymers Lecture Series, Oct. 14.  
*"Robust Production of a Peptide Library using Methodological Synchronization"*

## 2006

American Association for Nanomedicine Washington, DC, Sept. 9.  
*"Discovery and Exploitation of Allosteric Sites for Control of Protein Function."*

The College of the Holy Cross - Department of Chemistry, Sept. 29.

Clark University - Department of Chemistry, Oct. 4.

SUNY Albany - Department of Chemistry, Oct. 10.

Amherst College - Department of Chemistry, Oct. 20.

Mt. Holyoke College - Department of Biochemistry, Nov. 14.

University of Massachusetts Molecular & Cellular Biology Retreat. South Hadley, MA, March 18.  
*"Regulating Caspase Activity Using Native and Engineered Allosteric Sites"*

University of Massachusetts Amherst-Department of Polymer Science & Engineering, Dec. 1.  
*"Regulating Biopolymer Function with Allosteric Small Molecules"*

## 2005

Princeton University - Department of Chemistry, Jan. 4.

Georgia Institute of Technology - Department of Chemistry and Biochemistry, Jan. 10.

University of Texas Southwestern Medical Center - Department of Biochemistry, Jan. 13.

University of Illinois Urbana-Champaign - Department of Biochemistry, Jan. 17.

Indiana University - Department of Chemistry, Jan. 19.

Carnegie Mellon University - Department of Biology, Jan. 31.

University of Chicago - Department of Biochemistry, Feb. 8.

Utah State University - Department of Chemistry and Biochemistry, Aug. 26  
*"Discovery of an Allosteric Site in the Caspases Using Thiol-Directed Ligands."*

## 2004

Apoptosis in Biochemistry and Structural Biology Keystone Symposium, Keystone, CO. Feb. 6.

University of Southern California - Department of Chemistry, Jan. 27.

Saint Louis University - Department of Biology, Feb. 11.

Duquesne University - Department of Chemistry and Biochemistry, Feb. 23.

Pacific Coast Protease Workshop, Half Moon Bay, CA, April 26.

Barnard College - Department of Chemistry, Nov. 15.

University of Pennsylvania - Department of Biochemistry and Biophysics, Dec. 6.

Purdue University - Department of Biochemistry, Dec. 8.

University of Nebraska Medical Center - Department of Biochemistry and Molecular Biology, Dec. 13.

University of Massachusetts Amherst - Department of Chemistry, Dec. 16.  
*"Discovery of an Allosteric Site in the Caspases Using Thiol-Directed Ligands."*

## **INTERNATIONAL ORAL PRESENTATIONS BY HARDY GROUP MEMBERS**

Graduate student poster presenter underlined. Undergraduate presenters\*.

Derek MacPherson, Kevin Dagbay, and Jeanne A. Hardy. "Caspase-6 Self-Activation Enables Distinct Helix-Strand Interconversion Upon Substrate Binding" Association for Biochemistry and Molecular Biology (ASBMB) Annual Meeting at Experimental Biology - San Diego, CA April 21-25, 2018.

## **INTERNATIONAL POSTER PRESENTATIONS**

Graduate student poster presenter underlined. Undergraduate presenters\*.

Kevin D. Olson\*, Kristen L. Huber, and Jeanne A. Hardy. "Rapid Production of a Protease-Directed Peptide Library." Protein Society 22<sup>nd</sup> Annual Symposium, San Diego, CA. 7/27/2008.

Witold Witkowski and Jeanne A. Hardy. "Role of Caspase-7 L2' Loop in Active Site Formation and Allosteric Inhibition." Protein Society 22<sup>nd</sup> Annual Symposium, San Diego, CA. 7/27/2008.

Elih. M. Velazquez, Samantha Bernard, Kevin Olson, Sumana Ghosh and Jeanne A. Hardy. "Proton transport using alpha helical scaffolds." Society for Advancement of Chicanos and Native Americans in Science National Conference, Salt Lake City, UT. 10/11/2008.

Naomi Fox, Filip Jagodzinski, Jeanne Hardy, Ileana Streinu, "How Hydrogen Bond Redundancy Affects Protein Flexibility" Protein Society 23<sup>rd</sup> Annual Symposium, Boston, MA. 7/26/2009.

Witold Witkowski and Jeanne Hardy, "Studies of motion in the caspase-7 L2' loop." Protein Society 23<sup>rd</sup> Annual Symposium, Boston, MA. 7/26/2009.

Samantha Bernard, Genevieve Abbruzzese and Jeanne Hardy, "A Dark to Bright Reporter of Proteolytic activity" Protein Society 23<sup>rd</sup> Annual Symposium, Boston, MA. 7/26/2009.

Samantha Bernard, Jun Chu, Genevieve Abbruzzese, Kim Tremblay and Jeanne Hardy, "A Dark to Bright Reporter of Caspase activity" Cell Death Pathways: Apoptosis, Autophagy and Necrosis Keystone Symposium, Vancouver, BC. 3/16/2010.

Samantha Nicholls, Jun Chu, Genevieve Abbruzzese, Kim Tremblay and Jeanne Hardy, "A Dark to Bright Reporter of Proteolytic activity" Proteolytic Enzymes and their Inhibitors Gordon Research Conference, Barga, Italy. 5/5/2010.

Elih Velazquez-Delgado, Sravanti Vaidya, and Jeanne Hardy, "The role of the 90's helix in caspase-6 structure and activity" Proteolytic Enzymes and their Inhibitors Gordon Research Conference, Barga, Italy. 5/4/2010.

Sravanti Vaidya, Elih Velazquez-Delgado, Genevieve Abbruzzese and Jeanne Hardy, "Substrate-induced conformational changes in caspase-6 are independent of prodomain and intersubunit linker." Protein Society 24<sup>th</sup> Annual Symposium, San Diego, CA. 8/03/2010.

Sravanti Vaidya, Elih Velazquez-Delgado, and Jeanne Hardy, "Multiple Allosteric Sites Exist in Neurodegenerative Caspase-6" Proteins Gordon Research Conference, Holderness, NH 6/21/2011.

Elih Velazquez-Delgado and Jeanne Hardy, "Phosphorylation Regulates the Assembly of Active-Site Loops in Caspase-6" Proteins Gordon Research Conference, Holderness, NH. 6/22/2011.

Samantha Nicholls, Jun Chu, Genevieve Abbruzzese, Kim Tremblay and Jeanne Hardy, "Mechanism of A Dark to Bright Reporter of Proteolytic activity" Proteins Gordon Research Conference, Holderness, NH. 6/23/2011.

Kristen Huber and Jeanne Hardy, "Caspase-9 is regulated by zinc mediated inhibition and CARD-domain interactions" Protein Society 25<sup>rd</sup> Annual Symposium, Boston, MA. 7/26/2011.

Sravanti Vaidya, Elih Velazquez-Delgado, and Jeanne Hardy, "Multiple Allosteric Sites Exist in Neurodegenerative Caspase-6" Protein Society 25<sup>rd</sup> Annual Symposium, Boston, MA. 7/27/2011.

Filip Jagodzinski, Jeanne Hardy, and Ileana Streinu "Using Rigidity Analysis To Probe Mutation-Induced Structural Changes in Proteins" IEEE International Conference on Bioinformatics and Biomedicine, Washington D.C., 11/1/2011.

Scott Eron and Jeanne Hardy, "The Structural Mechanisms of Inhibition of Caspase-7 by Phosphorylation" Symposium on Biomolecular Structure, Dynamics & Function - St. Jude Children's Hospital, Memphis, TN April 27-29<sup>th</sup>, 2012. *Recipient of a Poster Prize.*

- Scott Eron, Elih Velazquez-Delgado and Jeanne Hardy, “The Structural Mechanisms of Inhibition of Caspase-6 and -7 by Phosphorylation” Proteolytic Enzymes and their Inhibitors Gordon Research Conference, Barga, Italy. 6/19/2012. *Recipient of the Protease GRC Outstanding Poster Award.*
- Kevin Dagbay and Jeanne Hardy, “Splicing, Prodomain and Intersubunit Linker Impact Caspase-6 Function and Stability” The 27th Annual Symposium of the Protein Society – Boston, MA July 20-23, 2013.
- Kevin Dagbay and Jeanne Hardy, “Probing Caspase-6 Domain Architecture for Regulation” Proteolytic Enzymes and their Inhibitors Gordon Research Conference, Barga, Italy, June 22-27, 2014.
- Banyuhay P. Serrano and Jeanne Hardy, “Phosphorylation by PKA Regulates Caspase-9 through Diverse Mechanisms” Keystone Symposium on Cell Death Signaling in Cancer and the Immune System, Sao Paulo, Brazil, October 28 - November 2, 2014.
- Derek MacPherson, Maureen E. Hill, Peng Wu, and Jeanne Hardy, “Altering Caspase Specificity Using an Intracellular Directed Evolution Approach” ASBMB, Boston, MA, March 2015.
- Maureen E. Hill, Derek MacPherson, Peng Wu, Olivier Julien, James A. Wells, Jeanne A. Hardy, “Engineering Caspases with Altered Specificities” Synthetic Biology: Engineering, Evolution and Design (SEED), Boston, MA, June 10-13, 2015.
- Derek MacPherson, Maureen Hill, Peng Wu, Olivier Julien, James A. Wells, Jeanne A. Hardy, “Reprogramming Caspase Activity by Directed Evolution Provides Alternate Solutions for Substrate Recognition” ACS, Boston, MA, August 16 – 20, 2015.
- Derek MacPherson, Maureen Hill, Peng Wu, Olivier Julien, James A. Wells, Jeanne A. Hardy, “Reprogramming Caspase Activity by Directed Evolution Provides Alternate Solutions for Substrate Recognition” Sci-Mix Special Poster Session, ACS Boston, Seaport District, Boston, MA, August 18, 2015.
- Maureen E. Hill, Derek MacPherson, Peng Wu, Olivier Julien, James A. Wells, Jeanne A. Hardy, “A Directed Evolution Approach to Engineer Caspase Specificity and Allostery” Proteolytic Enzymes and their Inhibitors Gordon Research Conference, Barga, Italy. June 26-July 1, 2016. *Recipient of a Poster Prize.*
- Derek MacPherson, Maureen Hill, Peng Wu, Olivier Julien, James A. Wells, Jeanne Hardy, “Interrogating Caspase-6 Selectivity Utilizing an Evolved Specificity Caspase Reveals Exosite Dependent Substrates” The 30<sup>th</sup> Symposium of the Protein Society, Baltimore, MD, July 16-19, 2016.
- Banyuhay P. Serrano and Jeanne Hardy, “Phosphorylation Controls Caspase-9 Function through Divergent Mechanisms” The 30<sup>th</sup> Symposium of the Protein Society, Baltimore, MD, July 16-19, 2016. *Recipient of a Poster Prize.*
- Maureen E. Hill, Derek MacPherson, Peng Wu, Olivier Julien, James A. Wells, Jeanne A. Hardy, “A Directed Evolution Approach to Engineer Caspase Specificity and Allostery” The 30<sup>th</sup> Symposium of the Protein Society, Baltimore, MD, July 16-19, 2016.
- Kevin Dagbay, Nicolas Bolik-Coulon, Sergey Savinov, and Jeanne A. Hardy, “Probing the Domain Architecture and Structural Dynamics of Caspase-6 for its Specific Regulation” The 30<sup>th</sup> Symposium of the Protein Society, Baltimore, MD, July 16-19, 2016.
- Kevin Dagbay, Nicolas Bolik-Coulon, Sergey Savinov, and Jeanne A. Hardy, “Probing the Domain Architecture and Structural Dynamics of Caspase-6 for its Specific Regulation” The First Gordon

Conference on Molecular Structure and Elucidation, Mt. Snow, West Dover, VT, August 14-19, 2016.

Maureen E. Hill, Derek MacPherson, Peng Wu, Olivier Julien, James A. Wells, Jeanne A. Hardy, "A Directed Evolution Approach to Engineer Caspase Specificity and Allostery" St. Jude National Graduate Student Symposium, St. Jude Children's Hospital, Memphis, TN, March 20-23, 2017.

Maureen E. Hill and Jeanne A. Hardy, "Conformational Flexibility is critical for Catalytic Activity of Dengue Virus NS2B-NS3 protease." 10th General Meeting of the International Proteolysis Society - Banff, AB Canada Oct 28-Nov1

Francesca Anson, Sankaran Thayumanavan, Jeanne A. Hardy, "Probing Caspase-Nanogel Self-Assembly and Release" The 32nd Symposium of the Protein Society, Boston, MA, July 9-12, 2018.

Ishankumar V. Soni, Kevin Dagbay, Eric Okerberg, Jennie Green, Tyzoon Nomanbhoy, Sergey Savinov, John Kozarich and Jeanne Hardy. "Investigating the functionality of ProCaspase-6 and caspase-6 by various nucleotides." The 32nd Symposium of the Protein Society, Boston, MA, July 9-12, 2018.

Maureen E. Hill and Jeanne Hardy. "Conformational Flexibility is critical for Catalytic Activity of Dengue Virus NS2B-NS3 protease." The 32nd Symposium of the Protein Society, Boston, MA, July 9-12, 2018.

## **REGIONAL and LOCAL POSTER PRESENTATIONS**

Students from my lab have presented 150+ posters at local and regional conferences including: The Northeast Structural Symposium, Northeast Bioengineering Conference, Smith Medical Foundation Annual Meetings, UMass REU symposiums, CBI Annual Joint retreats, UMass ResearchFest (annually), NEA-GEP/ICE Recruiting Weekend, MCB Retreat, Center for Chemical Innovation Symposium, and the University of Massachusetts System Undergraduate Conferences.

## **Graduate Student Awards and Prizes** (*\*National and International Awards*)

Sravanti Vaidya - Chemistry-Biology Interface Joint Retreat Outstanding Poster Prize, June 2007

Sravanti Vaidya - Peter C. Uden Outstanding Poster Presentation Award Sponsored by the William E. McEwen Fellowship, 2007

Kristen Huber - Peter C. Uden Outstanding Poster Presentation Award Sponsored by the William E. McEwen Fellowship, 2008

Sravanti Vaidya - Peter C. Uden Outstanding Poster Presentation Award, sponsored by Proctor and Gamble, 2009

Kristen Huber - UMass Outstanding Achievement in Chemistry Award, 2010

Witold Witkowski - Richard and Meryl Brown \$2000 Award for the Most Outstanding ResearchFest Presentation, 2010

Elih Velazquez-Delgado - Chemistry-Biology Interface Joint Retreat Outstanding Poster Prize, 2011

\* Scott J. Eron - Symposium on Biomolecular Structure, Dynamics & Function Poster Prize.- St. Jude Children's Hospital, Memphis, TN 2012.

\* Scott J. Eron - Proteolytic Enzymes and their Inhibitors Gordon Research Conference Outstanding Poster Award, Barga, Italy. 2012.

Bay Serrano - William E. McEwen Award for Outstanding Poster Presentation, UMass Chemistry ResearchFest, 2013

Kevin B. Dagbay - 3M Award for Most Outstanding Poster Presentation, UMass Chemistry ResearchFest, 2013

Bay Serrano - Best Poster Presentation, Joint CBI/BMB/BMP Retreat, UMass Worcester, 2014

Kevin B. Dagbay - William E. McEwen Award for Outstanding Poster Presentation, UMass Chemistry

- ResearchFest, 2014
- Bay Serrano - 3M Award for Most Outstanding Poster Presentation, UMass Chemistry ResearchFest, 2014
- Scott Eron – William E. McEwen \$2000 Award for Most Outstanding ResearchFest Presentation, 2014
- \* Bay Serrano - Keystone Symposia-FAPESP (São Paulo Research Foundation) Travel Fellowship, 2014
- Scott J. Eron - Best Poster Presentation, Joint CBI/BMB/BMP Retreat, UMass Worcester, 2015
- Bay Serrano - William E. McEwen Award for Outstanding Poster Presentation, UMass Chemistry ResearchFest, 2015
- Kevin B. Dagbay - William E. McEwen Award for Outstanding Poster Presentation, UMass Chemistry ResearchFest, 2015
- Scott J. Eron - William E. McEwen Award for Outstanding Poster Presentation, UMass Chemistry ResearchFest, 2015
- \*Derek MacPherson - Sci-Mix Poster Award, Annual Symposium of the American Chemical Society, 2015
- Bay Serrano – William E. McEwen \$2000 Fellowship Award for Outstanding Presentation during ResearchFest 2015
- \* Bay Serrano – Best Poster Award, 30<sup>th</sup> International Protein Society Meeting, Baltimore MD, 2016
- Kevin B. Dagbay – Best Poster Award, Best Poster Presentation, Joint CBI/BMB/BMP Retreat, Amherst, MA, 2016
- \* Maureen Hill – Gordon Research Seminar Poster Award Prize, Proteolytic Enzymes & Their Inhibitors in Il Ciocco, Italy 2016
- Derek MacPherson – Dr. Paul Hathaway Terry Graduate Scholarship Award for Outstanding ResearchFest Oral Presentation, 2016
- Maureen Hill – Dr. Paul Hathaway Terry Graduate Scholarship Award for Outstanding ResearchFest Oral Presentation 2017
- Derek MacPherson – William E. McEwen Award for Outstanding Poster Presentation, UMass Chemistry ResearchFest, 2017
- \* Maureen Hill – International Proteolytic Society Travel Award, 2017

## TEACHING

At University of Massachusetts

<i>Term</i>	<i>Course</i>	<i>Course Name</i>	<i>Credits</i>	<i>Instructor(s)</i>
F 17	CHEM 797T	Frontiers of Biotechnology	3	J. Hardy (50%) / B. Osborne
S 17	CHEM 423	Biochemistry for Chemists	3	J. Hardy (100%)
F 16	CHEM 121H	Honors General Chemistry	4	J. Hardy (100%)
S 16	CHEM 657	Drug Design	3	J. Hardy (50%) / S. Garman
S 16	CHEM 797T	Frontiers in Biotechnology	3	J. Hardy (50%) / B. Osborne
F 15	CHEM 121H	Honors General Chemistry	4	J. Hardy (100%)
S 15	CHEM 657	Drug Design	3	J. Hardy (50%) / S. Garman
F 14	CHEM 121H	Honors General Chemistry	4	J. Hardy (100%)
S 13	CHEM 657	Drug Design	3	J. Hardy (50%) / S. Garman
S 13	BIOC 697N	Hands on X-ray Diffraction	1	J.Hardy (33%) / S. Garman / K. Theis
F 12	CHEM 121H	Honors General Chemistry	4	J. Hardy (100%)
S 12	CHEM 657	Drug Design	3	J. Hardy (50%) / S. Garman
S 11	CHEM 657	Drug Design	3	J. Hardy (50%) / S. Garman
S 11	BIOC 697N	Hands on X-ray Diffraction	1	J.Hardy (33%) / S. Garman / K. Theis
F 10	CHEM 791A	Biomolecular Structure	3	J. Hardy (50%) / M. Chen
S 10	UNIV 197	Crime Scene Chemistry	1	J. Hardy (100%)
S 09	BIOC 697N	Hands on X-ray Diffraction	1	J.Hardy (33%) / S.Garman / K.Theis

S 09	CHEM 112	General Chemistry II	4	J. Hardy (100%)
F 08	CHEM 791A	Biomolecular Structure	3	J. Hardy (100%)
S 08	CHEM 112	General Chemistry II	4	J. Hardy (100%)
S 08	BIOC 697N	Hands on X-ray Diffraction	1	J. Hardy (33%) / S. Garman / K. Theis
S 07	CHEM 112	General Chemistry II	4	J. Hardy (50%) / R. Weis
S 07	BIOC 697N	Hands on X-ray Diffraction	1	J. Hardy (33%) / S. Garman / K. Theis
F 06	CHEM 791A	Biomolecular Structure	3	J. Hardy (100%)
S 06	-	X-ray Practical Mini Course	-	J. Hardy (33%) / S. Garman / K. Theis
F 05	CHEM 791A	Biomolecular Structure	3	J. Hardy (50%) / C. Martin
F 05	-	X-ray Practical Mini Course	-	J. Hardy (33%) / S. Garman / K. Theis

## RESEARCH TRAINING and MENTORING

### *Graduate Students*

<i>Name</i>	<i>Program</i>	<i>Degree</i>	<i>Dates</i>	<i>Present Position</i>
Shravanti Vaidya	Chemistry	Ph. D.	Jan 2006 – Jan 2011	Assistant Professor Ramaiah Institute of Technology. Bangalore, India
Witold Witkowski	Chemistry	Ph. D.	Jan 2006 – May 2011	Research Scientist at Boston Biomedical
Kristen Huber	Chemistry	Ph. D.	Jan 2006 – Jan 2012	Senior Research Scientist Signum Biosciences
Nivas Ramaswamy	Chemistry	M.S.	May 2006 – Aug 2007	Not reported
Allison Craney	Molecular & Cellular Biology	Rotation	Oct 2006 – Jan 2007	Strategy Consultant at Clarion Healthcare
Samantha Nicholls	Chemistry	Ph. D.	Jan 2008 – Dec 2012	Scientist at ScholarRock Inc.
Elih Velazquez	Chemistry	Ph. D.	Dec 2008 – Jun 2012	Genomics & Bioinformatics Dept. Naval Medical Research Center - Frederick
Daniel Seeman	Chemistry	M. S.	Dec 2008 – May 2010	Scientist at Apogee Research, LLC
Muslum Yildiz	Chemistry	Ph. D.	Dec 2008 – Oct 2013	Postdoctoral Fellow Hacettepe University
Leslie Conway	Molecular & Cellular Biology	Rotation	Oct 2008 – Jan 2009	Postdoctoral Associate at AstraZeneca-Tufts
Genevieve Abbruzzese	Molecular & Cellular Biology	Rotation	Sept 2009 – Jan 2010	Postdoctoral Fellow Harvard Medical School
Scott Eron	Chemistry	Ph. D.	Dec 2010 – Nov 2016	Scientist at C4 Therapeutics
Kevin Dagbay	Chemistry	Ph. D.	Dec 2010 – Apr 2017	Scientist at ScholarRock Inc.
Yunlong Zhao	Chemistry	M. S.	Dec 2011 – April 2014	Scientist at Regeneron Pharmaceuticals
Banyuhay Serrano	Chemistry	Ph. D.	Dec 2011 – Sept 2017	Postdoctoral Fellow UMass
Derek MacPherson	Chemistry	Ph. D.	Dec 2012 – Present	Graduate Student UMass
Maureen Hill	Chemistry	Ph. D.	Dec 2012 – Present	Graduate Student UMass
Francesca Anson	Chemistry	Ph. D.	Dec 2015 – Present	Graduate Student UMass

Ishankumar Soni	Chemistry	Ph. D.	Dec 2015 – Present	Graduate Student UMass
Kristalle Cruz	Chemistry	Ph. D.	Dec 2017 – Present	Graduate Student UMass
Yifei Pei	Chemistry	M. S.	Dec 2015 – May 2017	Job Search in Process
Kevin Ramos	PREP	-	Jun 2017 - Present	Post-Baccalaureate Student UMass

#### *Graduate Student Dissertation Titles*

Sravanti Vaidya, Ph.D.	(2006-2011):	“Structure and Function of Caspase-6.”
Witold Witkowski, Ph.D.	(2006-2011):	“Caspase-7 Loop Conformations as a means of Allosteric Control.”
Kristen Huber Ph.D.	(2006-2012):	“Regulation of Caspase-9 by Natural and Synthetic Inhibitors.”
Samantha Nicholls Ph.D.	(2008-2012):	“Development and Characterization of Caspase Activatable GFP and a Family of Fluorescent Reporters.”
Elih Velazquez Ph.D.	(2008-2012):	“Allosteric Regulation of Caspase-6 Proteolytic Activity.”
Muslum Yildiz Ph.D.	(2008-2013):	“Allosteric Regulation of Dengue Virus Type-2 Protease.”
Scott Eron Ph.D.	(2010-2016):	“Exploitation and Regulation of Apoptotic Caspases.”
Kevin Dagbay Ph.D.	(2010-2017):	“Probing the Domain Architecture and Structural Dynamics of Caspase-6 for its specific regulation.”
Banyuhay Serrano Ph.D.	(2011-2017):	“The Molecular Basis of Caspase-9 Inactivation by PKA and c-Abl Kinases.”

#### *Graduate Student and Postdoctoral Fellowships*

Kristen Huber	NIH Chemistry-Biology Interface Training Fellowship	(2007-2009)
Samantha Nicholls	Cellular Engineering-IGERT Fellowship	(2008-2010)
Elih Velazquez-Delgado	Nano-IGERT Fellowship	(2009-2011)
Scott Eron	Cellular Engineering-IGERT Fellowship	(2011-2013)
Bay Serrano	NIH Chemistry-Biology Interface Training Fellowship	(2013-2015)
Derek MacPherson	NIH Chemistry-Biology Interface Training Fellowship	(2014-2016)
Maureen Hill	Eugene M. Isenberg Scholar Award	(2015-2017)
Narasimharao Meka	Manning Inventor Post-doctoral fellow	(2015-2016)
Francesca Anson	NIH Biotechnology Training Program Fellowship	(2016-2018)
Ishan Soni	NIH Chemistry-Biology Interface Training Fellowship	(2017-2019)

#### *Undergraduate Students*

<i>Name</i>	<i>Program</i>	<i>Degree</i>	<i>Dates</i>
Ama Ruth Boadu	Biochemistry & Mol. Biology	B.S.	Oct 2005 - Aug 2006
Junean Brennan	Chemistry	B.S.	Oct 2005 - May 2006
Elih Velazquez	NEAGAP SPUR	-	Summer 2006
Prince Williams	Biochemistry & Mol. Biology	B.S.	June 2006 - May 2007
Kevin Olsen	Chemistry	B.S.	Jan 2007 - Aug 2008
Matt Barker	Biology	B.S.	Summer 2007
Jessica Bauer	CURE REU	-	Summer 2007
Shawn Haley	Biology	B.S.	Sept 2007 - May 2008
Baharah Barzegar	Chemical Engineering	B.S.	Summer 2008
Jamey Harrell	CURE REU	-	Summer 2008
Amanda Horgan	CURE REU	-	Summer 2009
Joachim Moch	CURE REU	-	Summer 2009



Lindsay Dawson	Chemistry	B.S.	Sept 2008 - Jun 2010
Eydis Lima	Chemical Engineering	B.S.	Sept 2008 - Jun 2009
Melissa F. Gold	Chemistry	B.S.	Sept 2009 - Jun 2010
Kyle Bernier	Chemistry	B.S.	Sept 2009 - Dec 2009
Joanne Philippeaux	Neuroscience	B.S.	Sept 2009 - June 2010
Sam Kmail	Chemistry	B.S.	Jun 2010 - Aug 2010
Charnell Chasten	CURE REU	-	Jun 2010 - Aug 2010
Greg Tuffy	Biochemistry	B.S.	March 2010 - May 2011
Toni Ambrogio	Nutrition	B.S.	Sept 2010 - May 2012
Jia Wei Chen	Biochemistry	B.S.	Sept 2010 - May 2011
Richard Boehnke	CURE REU	-	Jun 2011 - Aug 2011
Cynthia Honorat	Chemistry	B.S.	June 2011- June 2013
Di Lin	Chemistry	B.S.	June 2011- June 2013
Jacob Lytle	Chemistry & BMB	B.S.	Jan 2013 - May 2016
John Slattery	Biochemistry & Mol. Biology	B.S.	Sept 2013 - Oct 2014
Alesia Vialichka	Biology	B.S.	Sept 2013 - May 2016
Kyle Swainamer	Chemistry / BMB	B.S.	Oct 2014 - Mar 2016
Leslie Williams	ICE REU	-	June 2015 - Aug 2015
Elizabeth Barrett	Biochemistry & Mol. Biology	B.S.	Jun 2015 - May 2017
Talia Feldscher	High School Intern	-	June 2016 - Aug 2016
Leah Woldegiorgis	PREP student	Post Bac	Sept 2016 - May 2017
Abdul Wasay Paracha	Biochemistry & Mol. Biology	B.S.	Jun 2017 - Sept 2017
Kevin Ramos	PREP student	Post Bac	Sept 2017 - May 2018
Jiexian Carolyn Huang	Biochemistry & Mol. Biology	B.S.	Sept 2016 - July 2018
Amber Colon	Chemical Engineering	B.S.	May 2018 - present

*Post-doctoral Associates and Research Scholars Mentored*

<i>Name</i>	<i>Role in Hardy Lab</i>	<i>Dates</i>	<i>Present Position</i>
Sumana Ghosh	Postdoctoral Associate	Aug 2008 - July 2010	Scientist Vyome Biosciences
Jun Chu	Postdoctoral Fellow (Tremblay co-advisor)	Nov 2009 - July 2010	Assistant Professor Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences
Daniel Fowler	Postdoctoral Associate (Thompson co-advisor)	Oct 2009 - Aug 2010	Postdoctoral Associate University of Vermont
Peng Wu	Postdoctoral Fellow (Tremblay co-advisor)	Aug 2010 - Mar 2013	Sunnybrook Research Institute, Toronto, ON
Nicolas Bolik-Coulon	Visiting Scholar	Feb 2015 - Aug 2015	Graduate Student Brown University
Jorge Arias	Visiting Scholar	Sept 2015 - Nov 2015, July 2016 - Aug 2016	Graduate Student University of Costa Rica
Narasimha Rao Meka	Postdoctoral Fellow	Sept 2015 - present	Hardy Lab Post-doctoral Fellow

*Research Technicians Mentored*

<i>Name</i>	<i>Position</i>	<i>Dates</i>	<i>Present Position</i>
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Kristen Paczkowski	Research Technician	Nov 2005 - Jul 2007	Full-time Parent
Genevieve Abbruzzese	Research Technician	Jul 2007 - Aug 2009	Post-doctoral Associate Harvard Medical School

*Student Thesis Committee*

<i>Role</i>	<i>Type</i>	<i>Name</i>	<i>Program</i>	<i>Advisor</i>
Chair	Ph. D	Witold Witkowski	Chemistry	J. Hardy
Chair	Ph. D	Kristen Huber	Chemistry	J. Hardy
Chair	Ph. D	Sravanti Vaidya	Chemistry	J. Hardy
Chair	Ph. D	Samantha Nicholls	Chemistry	J. Hardy
Chair	Ph. D	Elih Velazquez	Chemistry	J. Hardy
Chair	Ph. D	Muslum Yildiz	Chemistry	J. Hardy
Chair	Ph. D	Scott Eron	Chemistry	J. Hardy
Chair	Ph. D	Kevin Dagbay	Chemistry	J. Hardy
Chair	Ph. D	Bay Serrano	Chemistry	J. Hardy
Chair	Ph. D	Derek MacPherson	Chemistry	J. Hardy
Chair	Ph. D	Maureen Hill	Chemistry	J. Hardy
Chair	Ph. D	Ishankumar Soni	Chemistry	J. Hardy
Co-Chair	Ph. D	Francesca Anson	Chemistry	J. Hardy
Chair	M. S.	Nivas Ramaswamy	Chemistry	J. Hardy
Chair	M. S.	Daniel Seeman	Chemistry	J. Hardy
Chair	M. S.	Yunlong Zhao	Chemistry	J. Hardy
Chair	M. S.	Yifei Pei	Chemistry	J. Hardy
Chair	B. S.	Lindsay Dawson	Chemistry Honors Thesis	J. Hardy
Chair	B. S.	Melissa Gold	Chemistry Honors Thesis	J. Hardy
Chair	B. S.	Di Lin	Chemistry Honors Thesis	J. Hardy
Chair	B. S.	Alesia Vialichka	BMB Honors Thesis	J. Hardy
Member	Ph. D	Abigail Ida Guce	Chemistry	S. Garman
Member	Ph. D	Mingxuan Zhang	Chemistry	I. Kaltashov
Member	Ph. D	Juma Bridgewater	Chemistry	R. Vachet
Member	Ph. D	Michael Murphy	Chemistry	K. Theis
Member	Ph. D	Jeffry L. Martin	Chemistry	M. Maroney
Member	Ph. D	Akamole Klakhard	Chemistry	S. Thayumanavan
Member	Ph. D	Booshan Popere	Chemistry	S. Thayumanavan
Member	Ph. D	Apiwat Chompoosor	Chemistry	V. Rotello
Member	Ph. D	Handan Akpinar	Chemistry	V. Rotello
Member	Ph. D	Michael Lartey	Chemistry	S. Thayumanvan
Member	Ph. D	Robert Herbst	Chemistry	M. Maroney
Member	Ph. D	Lawrence Borketey	Chemistry	N. Schnarr
Member	Ph. D	Yao Lu	Chemistry	I. Kaltashov
Member	Ph. D	John Hangasky	Chemistry	M. Knapp
Member	Ph. D	Bradley Duncan	Chemistry	V. Rotello
Member	Ph. D	Jordan Elliott	Chemistry	M. Farkas
Member	Ph. D	Joseph Tilitsky	Chemistry	L. Gierasch
Member	Ph. D	Yunlong Zhao	Chemistry	I. Kaltashov
Member	Ph. D	Hui-Hsien (Tanya) Lin	Chemistry	M. Farkas
Member	Ph. D	Tianying Liu	Chemistry	R. Vachet
Member	Ph. D	Bach Pham	Chemistry	M. Chen

Member	Ph. D	Zheyi Yi	Chemistry	S. Thayumanvan
Member	Ph. D	Jiale Du	Chemistry	E. Strieter
Member	Ph. D	Jenny L. Maki	Molecular & Cellular Biology	L. Gierasch
Member	Ph. D	Rob Smock	Molecular & Cellular Biology	L. Gierasch
Member	Ph. D	Mona Gupta	Molecular & Cellular Biology	R. Zimmerman
Member	Ph. D	Nilima Kolli	Molecular & Cellular Biology	S. Garman
Member	Ph. D	Matt Metcalf	Molecular & Cellular Biology	S. Garman
Member	Ph. D	Luis Ramirez-Tapia	Molecular & Cellular Biology	C. Martin
Member	Ph. D	Derrick Demming	Molecular & Cellular Biology	S. Garman
Member	Oral	Luis Ramirez-Tapia	Molecular & Cellular Biology	C. Martin
Member	Ph.D.	Heidi Hu	Molecular & Cellular Biology	M. Maroney
Member	Oral	Nils Pilotte	Molecular & Cellular Biology	S. Williams
Member	M.S.	Nicole Caci	Molecular & Cellular Biology	R. Zimmerman
Member	M.S.	Jerome Rogich	Molecular & Cellular Biology	S. Garman
Member	Ph. D	Daniel Sayut	Chemical Engineering	L. Sun
Member	Ph. D	Filip Jagodzinski	Computer Science	I. Strenu
Member	Ph. D	Naomi Fox	Computer Science	I. Strenu
Member	Ph. D	Yunxia Hu	Polymer Science & Eng.	T. Emrick
Member	Ph. D	A.Özgül Tezgel	Polymer Science & Eng.	G. Tew
Member	Ph. D	Michelle McKee	WPI, Biology & Biotech.	S. Roberts
Member	B. S.	Jillian Prendergast	BMB, Honors College	J. Normanly
Member	B. S.	Yurie Kim	BMB, Honors College	S. Garman
Member	B. S.	Josephine Harrington	Chemistry, Honors College	N. Forbes
Member	B. S.	Alex Barbato	Chemistry, Honors College	M. Knapp

## **SERVICE to the DEPARTMENT**

Chair of the RNA/Protein Engineering Faculty Search Committee – 2017

Chair of the Graduate Recruiting Committee (2010 – 2011, 2015-2016, 2017-2018)

Chair of Michelle Farkas' Mentoring Committee (2017- present)

Chair of Chemistry Department Seminar Committee (2005 - 2007)

Co-Chair of Institute of Cellular Engineering Faculty Search Committee (2009 - 2010)

Faculty Co-Advisor for the Association for Professional Development in Chemistry (Research Fest Committee) (2015-2018)

Faculty Co-Advisor for the Student Development Committee (2014-2015)

Member of the Personnel Committee (2012-2020)

Member of the AQAD committee (2016-2017)

Member of Graduate Recruitment Committee (2009 – 2010, 2011 – 2012, 2016-17)

Member of Mellon Mutual Mentoring Committee (2009 - present)

Member of the Strategic Planning Committee (2014 - present)

Member of Search Committee for Bio-organic Faculty Position (2006)

Member of Search Committee for Devices Faculty Position (2006)

Member of Search Committee for Biomedical Chemistry Faculty Position (2012-2013)

Member of Search Committee for Biomaterials Faculty Position (2014-2015)

Member of Search Committee for Three Faculty Positions (2015-2016)  
Member of Space Committee (2008 - 2009)  
Member of Undergraduate Program Committee (2007 - 2008)  
Member of ResearchFest Committee (2009 - 2010)  
Member of Development Committee (2009 - 2011)  
Judge for Research Fest (2005, 2006, 2008)

## **SERVICE to the UNIVERSITY**

PI and Director of the NIH T32 Biotechnology Training Program (2017 - present)  
Associate Director of the IALS Models to Medicine (M2M) Center (2015 - present)  
Co-I and Co-director of the NIH T32 Biotechnology Training Program (2015 - 2017)  
Executive Committee Member NIH T32 Chemistry Biology Interface Program (2016 - Present)  
Member of Molecular & Cell Biology Graduate Program Steering Committee (2015-2016)  
Member of the IALS Models to Medicine (M2M) Steering Committee (2013 - Present)  
Member of Biochemistry & Molecular Biology Faculty Search Committee (2014-2015)  
Member Chancellor's Junior Faculty Fellows (2008 - 2012)  
Executive Committee Member Institute for Cellular Engineering IGERT (2007 - 2014)  
Chair of Chemistry-Biology Interface Program Recruitment Committee (2006 - Present)  
Co-Chair of Chemistry-Biology Interface Retreat Committee (2006, 2007, 2008, 2009, 2010, 2011, 2012)  
Member of Molecular & Cellular Biology Curriculum Committee (2008 - 2013)  
Macromolecular x-ray facility tour guide to prospective undergraduate students (2005, 2006, 2007, 2009)  
A Ph.D. is Not Enough (APINE) workshop Invited Speaker (2007).  
Panel Member for Deans Excellence Initiative Fund (2006)

## **SERVICE OUTSIDE the UNIVERSITY**

Publications Committee:  
American Society for Biochemistry and Molecular Biology (2014-2017)

Nomination Committee:  
Protein Society (2015-2018)

Editorial Boards:  
Biochemical Journal (2010-2017)  
Frontiers in Cell Death and Survival (2014 - Present)

Meeting Organization:  
Chair of Cytoskeletal Dynamics session at the 23<sup>rd</sup> Annual Symposium of the Protein Society, Boston MA, July 25<sup>th</sup>, 2009.  
ASBMB Spotlight Session Organizer "Motion is Lotion: New Roles of Motion in Enzyme Function Experimental Biology, San Diego, CA April 21-25, 2018.

Co-Chair of Proteases as Regulators of Immunity and Inflammation Proteolytic Enzymes and their Inhibitors Gordon Research Conference, Barga, Italy, Jun. 4, 2018.  
Program Planning Committee for the 2018 Protein Society Meeting, Boston, MA, July 9-12, 2018.  
Vice Chair Proteolytic Enzymes and their Inhibitors Gordon Research Conference, June 2020.  
Chair Proteolytic Enzymes and their Inhibitors Gordon Research Conference, June 2022.

Poster Judging at International Meetings:

Poster Judge a - 23<sup>rd</sup> Annual Symposium of the Protein Society, Boston MA, July 25<sup>th</sup>, 2009.  
Judge for the 2011 IGERT Poster competition. May 3-5<sup>th</sup>, 2011.  
Judge for 2017 Undergraduate Poster Competition ASBMB Chicago, IL April 22, 2017  
Poster Judge - 30th Anniversary Symposium of the Protein Society, Baltimore MD, July 18<sup>th</sup>, 2016.

Manuscript Reviews (10-15/year):

ACS Medicinal Chemistry Letters  
ACS Chemical Biology  
Biochemical Journal  
Biochimica et Biophysica Acta  
Biophysical Journal Chemical Biology and Drug Design  
Cell Death and Differentiation  
Journal of Biological Chemistry  
Journal of Computational Chemistry  
Journal of the American Chemical Society  
Medicinal Research Reviews  
Molecular and Cellular Biology  
New Science Press  
Nature Protocols  
Nature Chemical Biology  
Nature Structural & Molecular Biology  
PLoS Computational Biology  
PLoS One  
Proceedings of the National Academy of Science  
Protein Expression & Purification  
Protein Science

Ad-hoc Grant Reviews (2-4/year):

National Science Foundation  
National Institutes of Health  
Center for Excellence in Apoptosis Research  
Dean's Excellence Initiative  
Research Corporation for the Advancement of Science

Study Section/Panel Attendance:

NIH MSFA Study Section - Permanent member – 2018-2024  
Beckman Young Investigator Selection Committee & Panel Member – 2017-2018  
NIH MSFA Study Section - Ad hoc member – Oct. 2016  
NSF Biotechnology & Biochemical Engineering Panel – Dec. 2015  
NSF Career Panel – Oct. 2014  
NIH Blueprint for Neuroscience Study Section – Dec. 2012

Ph.D. Committee External Member

Jacob P. Turowec, University of Western Ontario, London, ON Canada, Mar. 2013  
Djade Soumana, University of Massachusetts Medical School, Worcester, MA, Dec. 2015

Anniek den Hamer, Eindhoven University of Technology, Eindhoven, Netherlands, Dec. 2017

M.S. Committee External Member

Jeffrey Robert Lynham, McGill University, Nov. 28, 2016

Panelist

MassBioEd Life Sciences Workforce 2017, Northeastern U. Boston, MA June 7, 2017

Search Committee

Selection Committee for Unit Heads, Institute Pasteur, Paris, France, Apr. 2014

Professional Society Memberships

American Chemical Society

American Society for Biochemistry & Molecular Biology

Biochemical Society

Biophysical Society

Protein Society