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RESEARCH INTEREST

Mechanistic enzymology of ATP-dependent proteases
Develop inhibitors against DNA and RNA polymerases
Develop cell permeable modulators of ATP-dependent proteases

ACADEMIC TRAINING

- 1995-1998 Postdoctoral Research Associate,;
“Downregulation of a cell-cycle regulated DNA methyltransferase by ATP-dependent proteolysis”, Professor Stephen J Benkovic, research mentor
The Pennsylvania State University, University Park, PA
- 1989-1995 Ph.D. in Chemistry,;
“Development of catalytic antibodies with amidase activities”,
Professor Stephen J Benkovic, research mentor
The Pennsylvania State University, University Park, PA
- 1985-1989 Dual majors: B.S. in Chemistry, B.A. in Biology,
“Synthesis of sterically hindered xanthe-9-one derivatives by a novel Umplong method”,
Professor James L Fry, undergraduate research mentor
University of Toledo, Toledo, OH

PROFESSIONAL EXPERIENCE

- 2012-present Professor, Department of Chemistry, Case Western Reserve University,
Cleveland, OH
- 2009 June Invited Visiting Professor, Enzymologie Moléculaire et Fonctionnelle,
Université Pierre et Marie Curie, Paris, France (Host: Pr Michèle Reboud-
Ravaux)
- 2005-2012 Associate professor, Department of Chemistry, Case Western Reserve
1998-2005 Assistant Professor, Department of Chemistry, Case Western Reserve
University, Cleveland, OH

HONORS AND AWARDS

Nominee for Undergraduate Teaching Excellence Award, 2014
Nominee for Undergraduate Teaching Excellence Award, 2002
Glennan Teaching fellowship
Presidential research Initiative Award
Center for AIDS Research (CFAR) Developmental Award
National Research Council, Twinning Program Award, 2003-2005;
“Cooperation of the ATP-dependent Lon Protease with the DnaK/DnaJ chaperone System”
C. K. Suzuki (PI), I. Lee (co-PI), E. Kutejova (co-PI)

FUNDING

Past

Center For AIDS Research (CFAR) Developmental Award
Molecular Mechanism of AZT Resistance by HIV Reverse Transcriptase Mutants.
6/1/1999-3/31/2000
I. Lee (PI)

Presidential Research Initiative (PRI) Award
Determining the Kinetic Mechanism of Energy-Coupled Protein Degradation by the
Mitochondrial Lon Protease.
1/1/2002- 12/31/2003.
I. Lee (PI), A. J. Berdis (co-PI)

NIH/NIGMS
Kinetic Characterization of Lon Protease
1/1/03-12/31/08; I. Lee (PI)

NIH/NCI
Non-natural Nucleoside Inhibitors of DNA Polymerases
6/1/2005-4/30/2011; A. J. Berdis (PI); I. Lee (co-PI)

NIH/NIGMS
High Throughput Screening assay for the ClpXP I. Lee (sub-contract PI)
06/01/2010-05/31/2011

NIH/NIGMS
High Throughput Screens for Modulators of Mitochondrial ATP-dependent proteolysis
05/01/2009-04/31/2011

NIH/NIGMS
Amine Oxidations
5/1/2009-4/30/2012; I. Lee (PI)

NSF
Mechanism of ATP-Dependent Proteolysis by Lon Protease I. Lee (PI)
7/1/2009-6/30/2012

Current

NSF
Chemical biology of energy-dependent proteolysis in mitochondria I. Lee (PI)
8/1/2012-present

PUBLICATIONS

1. J. Schwefel, R. E. Ritzmann, I. Lee, A. Pollack, W. Weeman, S. Garverick, M. Willis, M. Rasmussen and D. Scherson, "Wireless Communication by an Autonomous Self-Powered Cyborg Insect", Journal of The Electrochemical Society, in press

2. K. A. Strauss, R. N. Jinks, E. G. Puffenberger, S. Venkatesh, K. Singh, I. Cheng, N. Mikita, J. Thilagavathi, J. Lee, S. Sarafianos, A. Benkert, A. Koehler, A. Zhu, V. Trovillion, M. McGlincy, T. Morlet, M. Deardorff, A. Innes, C. Prasad, A. E. Chudley, I. Lee, C. K. Suzuki, "CODAS Syndrome Is Associated with Mutations of LONP1, Encoding Mitochondrial AAA+ Lon Protease," *The American Journal of Human Genetics*, in press
3. B. Devadoss, I. Lee, A. J. Berdis, "Spectroscopic analysis of polymerization and exonuclease proofreading by a high-fidelity DNA polymerase during translesion DNA synthesis." *BBA-Proteins and Proteomics* 1834(1):34-45 (2013)
4. E. A. Motea, I. Lee, A. J. Berdis, "Insights into the roles of desolvation and π -electron interactions during DNA polymerization", *Chembiochem*.14(4):489-98 (2013).
5. J. Golden, E. Motea, X. Zhang, J. S. Choi, Y. Feng, Y. Xu, I. Lee, A. J. Berdis, "Development and characterization of a non-natural nucleoside that displays anticancer activity against solid tumors", *ACS Chem Biol*. 8(11):2452-65 (2013)
6. N. Mikita, I. Cheng, J. Fishovitz, J. Huang, I. Lee, "Processive degradation of unstructured protein by Escherichia coli Lon occurs via the slow, sequential delivery of multiple scissile sites followed by rapid and synchronized peptide bond cleavage events", *Biochemistry*. 52(33):5629-44 (2013)
7. S. Craig, L. Gao, I. Lee, T. Gray and A.J. Berdis, "Gold-Containing Indoles as Anti-Cancer Agents that Potentiate the Cytotoxic Effects of Ionizing Radiation", *J Med Chem*. 55(5):2437-51 (2012)
8. I. Cheng, N. Makita, J. Fishovitz, H. Frase, P. Wintrode and I. Lee, "Identification of a region in the N-terminus of Escherichia coli Lon that affects ATPase, substrate translocation and proteolytic activity" *J. Mol. Biol.* 418, 208-225 (2012)
9. S. Venkatesh, J. Lee, K. Singh, I. Lee, C. K. Suzuki CK. "Multitasking in the mitochondrion by the ATP-dependent Lon protease." *Biochim Biophys Acta*. 1823, 56-66 (2012).
10. E. A. Motea, I. Lee, A. J. Berdis, "A non-natural nucleoside with combined therapeutic and diagnostic activities against leukemia", *ACS Chem Biol*.15;7(6):988-98 (2012)
11. E.A. Motea, I. Lee and A. J. Berdis, "Development of a 'clickable' non-natural nucleotide to visualize the replication of non-instructional DNA lesions", *Nucleic Acids Res*.40(5):2357-67 (2012)
12. Rasmussen M, Ritzmann RE, Lee I, Pollack AJ, Scherson D, "An implantable biofuel cell for a live insect", *J Am Chem Soc*. 134(3):1458-60 (2012)
13. M. Rasmussen, R. West, J. Burgess, I. Lee and D. Scherson, "Bifunctional trehalose anode incorporating two covalently linked enzymes acting in series." *Anal Chem*. **83**, 7408-11 (2011)
14. J. Fishovitz, M. Li, H. Frase, J. Hudak, S. Craig, K. Ko, A. J. Berdis, C. K. Suzuki and I. Lee, "Active-site directed chemical tools for profiling mitochondrial Lon protease" *ACS Chemical Biology* **6**, 781-8 (2011)
15. K. Ernberg, B. Zhon, K. Ko, L. Miller, Y. H. Le Nguyen, L. M. Sayre, J. M. Guss, and I. Lee, "Structural and enzyme activity studies demonstrate that aryl substituted 2,3-butadienamine analogs inactivate *Arthrobacter globiformis* amine oxidase (AGAO) by chemical derivatization of the 2,4,5-trihydroxyphenylalanine quinone (TPQ) cofactor", *BBA-proteins and proteomics* **1814**, 638-46 (2011)
16. E.A. Motea, I. Lee, A. J. Berdis, "Quantifying the energetic contributions of desolvation and π -electron density during translesion DNA synthesis", *Nucleic Acids Res* **39**, 1623-37 (2011)
17. K. Knott, J. Fishovitz, S. B. Thorpe, I. Lee and W. L. Santos, "N-terminal peptidic boronic acids selectively inhibit human ClpXP", *Organic and Biomolecular Chemistry*, *Org Biomol Chem* **8**, 3451-6 (2010).

18. X. Zhang, E. Motea, I. Lee and A.J. Berdis, "Replication of a Universal Nucleobase Provides Unique Insights into the Role of Entropy during DNA Polymerization and Pyrophosphorolysis," *Biochemistry* **49**, 3009-23 (2010)
19. J. Thomas, J. Fishovitz and I. Lee, "Utilization of Positional Isotope Exchange Experiment to Evaluate Reversibility of ATP Hydrolysis Catalyzed by Escherichia coli Lon Protease", *Biochemistry and Cell Biology* **88**, 119-28 (2010, invited research article)
20. J. Patterson-Ward, J. Tedesco, J. Hudak, J. Fishovitz, H. Frase, K. McNamara and I. Lee, "Utilization of Synthetic peptides to Evaluate the Importance of Substrate Interaction at the Proteolytic Site of Escherichia coli Lon Protease", *BBA-Proteins and Proteomics* **1804**, 1064-80 (2010, invited research article)
21. A. Sheriff, E. Motea, I. Lee and A. J. Berdis, "Mechanism and Dynamics of Translesion DNA Synthesis Catalyzed by the *Escherichia coli* Klenow Fragment", *Biochemistry* **47**, 8527-37 (2008)
22. C. K. Suzuki and I. Lee, "Functional mechanics of the ATP-dependent Lon protease-lessons from endogenous protein and synthetic peptide substrates", *Biochim Biophys Acta* **1784**, 727-35 (2008) (invited review)
23. S. Licht and I. Lee, "Resolving individual steps in the operation of ATP-dependent proteolytic molecular machines: from conformational changes to substrate translocation and processivity", *Biochemistry* **47**, 3595-605 (2008) (invited review)
24. A. Bayot, N. Basse, I. Lee, M. Gareil, B. Pirotte, AL. Bulteau, B. Friguet and M. Reboud-Ravaux, "Towards the Control of Intracellular Protein Turnover: Mitochondrial Lon Protease Inhibitors Versus Proteasome Inhibitors," *Biochimie* **90**, 260-9 (2008)
25. B. Devadoss, I. Lee and A. J. Berdis, "Enhancing the "A-rule" of Translesion DNA Synthesis: Pro-Mutagenic DNA Synthesis using Modified Nucleoside Triphosphates", *Biochemistry* **46**, 13752-61 (2007)
26. J. Patterson-Ward, J. Huang and I. Lee, "Detection and characterization of two ATP-dependent conformational changes in proteolytically inactive Escherichia coli Lon mutants by stopped flow kinetic techniques", *Biochemistry* **46**, 13593-605 (2007)
27. H. Frase and I. Lee, "Peptidyl Boronates Inhibit *Salmonella enterica* serovar Typhimurium Lon Protease by a Competitive ATP-Dependent Mechanism", *Biochemistry* **46**, 6647-57 (2007)
28. B. Devadoss, I. Lee and A. J. Berdis, "Is a thymine dimer replicated via a transient abasic site intermediate? A comparative study using non-natural nucleotides", *Biochemistry* **46**, 4486-98 (2007)
29. I. Lee and A. J. Berdis, "Fluorescent analysis of translesion DNA synthesis by using a novel, non-natural nucleotide analogue", *ChemBiochem.* **7**, 1990-1997 (2006)
30. X. Zhang, A. Donnelly, I. Lee and A. J. Berdis, "Rational attempts to optimize non-natural nucleotides for selective incorporation opposite an abasic site", *Biochemistry* **45**, 13293-303 (2006)
31. I. Lee, A. J. Berdis and C. K. Suzuki, "Recent development in the mechanistic enzymology of the ATP-dependent Lon protease from Escherichia coli: highlights from kinetic studies", *Mol. BioSyst.* **2**, 477-483 (2006). (invited review)
32. D. Vineyard, X. Zhang and I. Lee, "Transient kinetic experiments demonstrate the existence of a unique catalytic enzyme form in the peptide-stimulated ATPase mechanism of Escherichia coli Lon protease", *Biochemistry* **45**, 11432-43 (2006)
33. H. Frase, J. Hudak and I. Lee, "Identification of the proteasome inhibitor MG262 as a potent ATP-dependent inhibitor of the salmonella enterica serovar Typhimurium Lon protease", *Biochemistry* **45**, 8264-74 (2006)
34. D. Vineyard, J. Patterson-Ward and I. Lee, "Single-turnover kinetic experiments confirm the existence of high- and low-affinity ATPase sites in Escherichia coli Lon protease", *Biochemistry* **45**, 4602-10 (2006)

35. X. Zhang, I. Lee and A. J. Berdis, "Hydrophobicity, shape, and π -electron contributions during Translesion DNA Synthesis ", *JACS* **128**, 143-9 (2006)
36. X. Zhang, I. Lee and A. J. Berdis, "The use of nonnatural nucleotides to probe the contributions of shape complementarity and pi-electron surface area during DNA polymerization", *Biochemistry* **44**, 13101 (2005)
37. X. Zhang, I. Lee and A. J. Berdis, "A potential chemotherapeutic strategy for the selective inhibition of promutagenic DNA synthesis by non-natural nucleotides", *Biochemistry* **44**, 13111 (2005)
38. D. Vineyard, J. Patterson-Ward, A. J. Berdis and I. Lee, "Monitoring the timing of ATP hydrolysis with activation of peptide cleavage in *Escherichia coli* Lon by transient kinetics", *Biochemistry* **44**, 1671 (2005)
39. I. Lee and A. J. Berdis, In *Enzymes and Their Inhibitions: Drug Development*; H. J. Smith and C. Simon, Eds.; Chapter 2, Section 2: "Kinetics", CRC Press LLC, in press.
40. X. Zhang, I. Lee and A. J. Berdis, "Evaluating the contributions of desolvation and base-stacking during translesion DNA synthesis", *Organic & Biomolecular Chemistry* **2**, 1703-1711 (2004)
41. J. Patterson, D. Vineyard, J. Thomas-Wohlever, R. Behshad, M. Burke and I. Lee*, "Correlation of an adenine-specific conformational change with the ATP-dependent peptidase activity of *Escherichia coli* Lon", *Biochemistry* **43**, 7432-7442 (2004)
42. T. Liu, B. Lu, I. Lee, G. Ondrovicoya, E. Kutejova and C. K. Suzuki, "DNA and RNA binding by the mitochondrial Lon protease is regulated by nucleotide and protein substrates", *J Biol. Chem.* **279**,13902-10(2004)
43. B. Lu, T. Liu, J. A. Crosby, J. Thomas -Wohlever, I. Lee and C. K. Suzuki, "The ATP-dependent Lon protease of *Mus Musculus* is a DNA-binding protein that is functionally conserved between yeasts and mammals", *Gene* **306**, 45-55 (2003).
44. J. Thomas-Wohlever and I. Lee*, "Kinetic characterization of the peptidase activity of *Escherichia coli* Lon reveals the mechanistic similarities in ATP-dependent hydrolysis of peptide and protein substrates" *Biochemistry* **41**, 9418-25 (2002)
45. I. Lee and A. J. Berdis, "Adenosine triphosphate-dependent degradation of a fluorescent λ N substrate mimic by Lon protease", *Anal. Biochem.* **291**, 74-83 (2001)
46. I. Lee and S.J. Benkovic, "Catalytic Antibodies,"in *Encyclopedia of Immunology* 2nd ed., P.J. Delves and I.M. Roitt, Eds., Academic Press Ltd, London pp. 438-444 (1998).
47. A. J. Berdis, I. Lee, J. K. Coward, C. Stephens, R. Wright, L. Schapiro and S. J. Benkovic, "A cell-cycle regulated adenine DNA methyltransferase from *Caulobacter crescentus* processively methylates GANTC Sites on hemimethylated DNA", *Proc. Natl. Acad. Sci. (USA)* **95**, 2874-2879 (1998)
48. S. De Lauzon, R. Quilez, L. Lion, B. Desfosses, B. Desfosses, I. Lee, M. A. Sari, S. J. Benkovic, D. Mansuy, J. P. Mahy, "Active site topology of artificial peroxidase-like hemoproteins based on antibodies constructed from a specifically designed ortho-carboxy-substituted tetraarylporphyrin", *Eur. J. Biochem.* **257**, 121-30 (1998)
49. I. Lee, J. Stewart, W. Zhong and S. J. Benkovic, "A chemiluminescent immunoassay for the identification of functional single-chain antibodies", *Anal. Biochem.* **230**, 62-7 (1995)
50. C. Brummel, I. Lee, Y. Zhou, S. J. Benkovic and N. Winograd,"A solution to the address problem of combinatorial libraries", *Science* **264**, 399-402 (1994)
51. B. Posner, J. Smiley, I. Lee and S. J. Benkovic, "Catalytic antibodies: perusing the combinatorial library", *TIBS* **19**, 145-50 (1994)
52. B. Posner, I. Lee, T. Itoh, J. Pyati, R. Graff, G. B. Thorton, R. La Polla and S. J. Benkovic,"A revised strategy for cloning antibody gene fragments in bacteria", *Gene* **128**, 111-7 (1993)

Patents

1. S. J. Benkovic, N. Winograd, C. Brummel and I. Lee; U.S. Patent 5834195 (1998)
2. L. Shapiro, S. J. Benkovic, R. Wright, C. Stephens, L. S. Kahng, A. Berdis and I. Lee; U.S. Patent 6413751 (2002)

Invited Research Seminars: (1998 – present)

Enzymes, Coenzymes & Metabolic Pathways Gordon Research Conference
 “The Workings of an ATP-Dependent Protease: A Tale of Three Substrates” 2014
 Department of Chemistry and Biochemistry, University of Maryland, Baltimore County
 “A kinetic approach to study the workings of energy-dependent proteases: learning from synthetic peptides and endogenous protein substrates” 2013
 Department of Molecular Biology and Biochemistry, UC Irvine
 “A Chemical Approach to Study the ATP-dependent Protease Lon” 2011
 Department of Chemistry and Biochemistry, Rowan University
 “A Chemical Approach to Study the ATP-dependent Protease Lon” 2011
 Department of Chemistry and Biochemistry, University of Notre Dame
 “A Chemical Approach to Study the ATP-dependent Protease Lon” 2010
 Department of Biochemistry, University of Nebraska-Lincoln
 “Insights into the Regulation of Mitochondrial ATP-Dependent Proteases: Lessons from Enzymology” 2009
 8th International Conference on AAA Proteins, Toronto 2009
 “Chemical Tools for Studying the ATP-dependent Protease Lon”.
 Institut de Chimie des Substances Naturelles 2009
 “Le Développement de sondes Chimiques pour L’étude de Protéases Mitochondriales ATP-dépendantes”.
 Université Pierre et Marie Curie, Enzymologie Moléculaire et Fonctionnelle 2009
 “Le Développement de sondes Chimiques pour L’étude de Protéases Mitochondriales ATP-dépendantes”.
 Oklahoma Medical research Foundation 2008
 “A Chemical Approach to Elucidate the Physiological Roles of the ATP-dependent Proteases in Mitochondria”.
 University of Toledo, Department of Chemistry 2008
 “A Kinetic Approach to Study the ATP-Dependent Protease Lon”
 Georgia State University, Department of Chemistry 2008
 “A Kinetic Approach to Study the ATP-Dependent Protease Lon”
 University of North Carolina Chapel Hill, Division of medicinal Chemistry and Natural Products, School of Pharmacy 2008
 “From Mechanistic Enzymology to Therapeutics”
 Baldwin Wallace College, Department of Chemistry 2007
 “Characterization of an ATP-dependent protease responsible for aging and bacterial infection”
 John Carroll University, Department of Chemistry 2007
 ““Characterization of an ATP-Dependent Protease Responsible for Aging and Bacterial Infection”
 The Pennsylvania State University, Department of Biochemistry and Molecular Biology 2007
 “Utilization of a Kinetic Approach to Study the Mechanism of the ATP-Dependent Protease Lon”
 Eastern Michigan University, Department of Chemistry 2007
 “From Enzyme Mechanism to Therapeutics”
 Youngstown State University, Department of Chemistry 2006
 “Development of anti-bacterial agent through mechanistic enzymology of Lon protease”
 Otterbein College, Department of Chemistry 2005

"Mechanistic Characterization of the Stress-Induced Protease Lon"
 Washington State University, Department of Chemistry 2005

"Mechanistic Characterization of the Stress-Induced Protease Lon"
 Purdue University, Department of Chemistry 2004

"Mechanistic Characterization of the ATP-Dependent Protease Lon"
 Ohio State University, Department of Biochemistry 2004

"Mechanistic Characterization of the ATP-dependent Protease Lon"
 Midwest Enzyme Chemistry Conference XXIV, 2004

"Mechanistic Characterization of the ATP-dependent Protease Lon"
 Rutgers University, Department of Chemistry 2004

"On the Mechanics of Chewing up Proteins by the Stress-induced Protease Lon"
 Wesleyan University, Molecular Biology and Biochemistry Department 2004

"On the Mechanics of Chewing up Proteins by the Stress-induced Protease Lon"
 Ohio State University, Department of Chemistry 2004

"Exploring the Reaction Mechanism of the ATP-dependent Protease Lon"
 Auburn University, Department of Chemistry 2004

"Mechanistic Characterization of the Stress-Induced Protease Lon"
 University of Cincinnati, Department of Chemistry 2003

"Combating Metabolic and Infectious Diseases by Targeting Lon Protease"
 Westminster College, Department of Chemistry 2003

"Combating Metabolic and Infectious Diseases by Targeting Lon Protease"
 Youngstown State University, Department of Chemistry 2002

"Examining the Mechanism of ATP-Dependent Peptide Cleavage by Lon Protease"
 University at Buffalo; the State University of New York, Department of Chemistry 2002

"Examining the Mechanism of ATP-Dependent Peptide Cleavage by Lon Protease"
 Wayne State University, Department of Chemistry 2002

"Examining the Molecular Basis for ATP Consumption in Energy-dependent Proteolysis"
 Case Western Reserve University, Department of Biochemistry 1999

"Understanding the Mechanism of ATP-Dependent Proteolysis"
 University of Toledo, Department of Chemistry 1999

"Understanding the Mechanism of ATP-Dependent Proteolysis"
 Case Western Reserve University, Department of Pharmacology 1998

"Screening Bacteriophage Libraries for Catalytic Antibodies with Peptidase Activities"

SOCIETY MEMBERSHIP

American Chemical Society
 Alpha Chi Sigma

PROFESSIONAL SERVICES AND ACTIVITIES (1998 – present)

- MEETING-IN-MINIATURE, Session Chairperson for the Biochemistry division, American Chemical Society, Cleveland Section, March 13, 2002
- Served as session Chair in the GRCs in 2005, 2009, 2010
- Served as session Chair in the 19th Enzyme Mechanism Conference 2005
- Member of the editorial board of BBA-Proteins and Proteomics Member 1/1/2010-12/31/2012
- Member of the editorial board of J. Med. Chem. & Enzy. Inh. 2010-2012
- Review for Biochemistry; Biochimica et Biophysica acta (BBA)-Proteins and Proteomics; J. Biol. Chem.; Archives of Biochemistry and Biophysics (ABB); FEBS Lett; J. of Med. Chem. & Enzy. Inh., Nature Chemistry, Biochemistry, PNAS

- Review grant proposals for NIHGM (ad hoc member in SBCB, MSFE and challenge grants), NIH pre- and post-doctoral fellowships, NSF/MCB, NSF/CLP CAREER, Research Corporation for Science Advancement and ACS/PRF type G
- Mail reviewer for NSF grant proposals
- Co-organize the Frontiers in Bioorganic Chemistry and Enzymology 2008
- Executive editor of BBA-Proteins and proteomics 1/1/2012 – present

TRAINEES

Postdoctoral Research Associate

2002-2006 Xumei Zhang (joint supervision with A. J. Berdis)
 2008-2011 Sandra Craig (joint supervision with A. J. Berdis)
 2011-2012 Anthony Vortherm (joint supervision with A. J. Berdis)

Ph.D. Graduate

1999–2003 Jennifer Thomas-Wohlever
 Currently employed as research scientist at WIL Research
 2002-2006 Diana Vineyard-Barko
 Currently a faculty member in the Department of Chemistry at Baldwin Wallace College
 2003-2007 Hilary Frase
 Currently an evaluator at Western Governors University
 2002-2007 Jessica Patterson-Ward
 Currently a Ph.D. research scientist at Pfizer
 2003-2008 Babho Devadoss
 Currently a research scientist at Blue Sky Bioservices
 2005-2010 Jennifer Fishovitz
 Currently a postdoctoral fellow in the Department of Chemistry and Biochemistry at the University of Notre Dame
 2006-2012 Edward Motea
 Currently a postdoctoral fellow at UT Southwestern Medical Center
 2009-2014 Natalie Mikita
 Currently a visiting assistant professor in the Department of Chemistry at Penn State Erie, The Behrend College

Predoctoral Graduate Students

2009-present Iteen Cheng

Undergraduate Research

CASE students:
 Nataly Birman (1999, Chem 397)
 Larry Miller (1999-2000, Chem 397)
 Emily Bloomfield (2000, Chem 397)
 Stephanie Barbour (2000-2001)
 Amy Coulter (2000-2001, Chem 397)
 Amanda Storozuk (2001, Chem 397)
 Christine Conageski (2002, Chem 397)
 Tony Masri (2002, Chem 397)
 Danielle Slifko (2002, Chem 397)
 Jonathan Ipsaro (2003, Chem 397)
 Alison Donnelly (2005, Chem 397)

Jason Hudak (2006, Chem 397)
Kristen Ko (2009, Chem 397)
Sarah Woldemariam (2010-2011, CHEM 397)
Shen, Shirley Xiaoying (2012-2014, CHEM 397 and CHEM 398)
Jordan Fraboni (2012-2013 as a Biology elective)

Summer Program for Undergraduate Research (SPUR) Students:

Jonathan Huang (2007-2008)
Christie Stueffer (1999)
Kirsten McNamara (1999, 2000)
Ramona Behshad (2002)

TEACHING

CHEM 321 (Lab Methods and Techniques I); first semester sophomore chemistry lab for B.S. majors; 72 contact hours per semester
Responsibility: lectures, lab supervision, grading lab reports, proctoring exams
Taught from 1998-2001

CHEM 322 (Lab Methods and Techniques II); second semester sophomore chemistry lab for BS majors; contact hours: 6 hours per week, 72 hours per semester
Taught from 1999-2003

CHEM 323 (Organic Chemistry I); first semester sophomore organic chemistry for B.S. majors; 30 lecture hours plus 12 office hours per semester
Responsibility: lectures, evening review sections, grading, proctoring exams
Taught from 2002-2004; 2008

CHEM 324 (Organic Chemistry II); second semester organic chemistry for B.S. majors
Same responsibility as CHEM 323
Taught from 2004-2005; 2009

CHEM 605 (Chemistry Colloquium Series): prepare students for the upcoming colloquium seminar speaker's talk on a weekly basis. Each student will give an oral presentation on the upcoming colloquium speaker's research background. 12 contact hours per semester
Taught in 2004

CHEM 328/428 (Introductory Biochemistry): a survey course taught to chemistry undergraduate and graduate students. This course is offered in the fall semester and is taken by undergraduate as well as graduate students. Each graduate student is required to submit a term paper written as a manuscript submitted for publication.
Taught in 2005-2008

CHEM 329/429 (Chemical Aspect of Living Systems): a biochemical course focusing on the reaction mechanisms of metabolic pathways. This course is offered in the spring semester and is taken by undergraduates as well as graduate students. Each graduate student is required to submit a research proposal related to drugs and metabolism.
Taught in 2006 and 2007

CHEM 333/433 (Medicinal Chemistry and Drug Development): this course provides an overview on how principles in chemistry and biology are integrated to facilitate drug

development. Primary emphasis will be placed on the development of organic molecules as drugs and metabolic enzymes as drug targets. Subjects pertinent to the introduction of medicinal chemistry, evaluation of drug efficacies in vitro and in vivo, and drug metabolism will be covered

CHEM 421 (Graduate Level Physical Organic Chemistry): this course constitutes the first semester of Organic Chemistry taken by first year Chemistry graduate students. Topics including structure, bonding, and molecular orbital theory; stereochemistry and conformational analysis; reaction mechanisms; aromaticity and aromatic substitution are typically covered. I have chosen to use the text book Modern Physical Organic Chemistry by E. Anslyn and D. Dougherty for the course.

FSNA 122 -100 (Science in the World of Harry Potter): the Harry Potter books have attracted more readers than any other fantasy novel series. This freshmen seminar-based course will discuss how science may account for or duplicate some of the magical endeavors described in the novels. We will assess the feasibility of certain means of transportation, such as traveling by the floo network, apparitions, and broomsticks, in the context of modern science and technology. Parallels between certain potions and contemporary drugs will be evaluated. The seminar's conceptual framework, integrating fantasy with technology, will loosely follow the format of Michio Kaku's nonfiction book "Visions: How Science Will Revolutionize the 21st Century." Professor Kaku offers the provocative thesis that many "fairy tale ideas" may be possible in the future thanks to advances in science and technology. A combination of Rowling and Kaku in one course should offer a unique opportunity for SAGES learning

DEPARTMENTAL SERVICE

General Committees

Graduate Student Affair Committee, Chair (2008-2012): make recommendation to the department chair in the assignment of teaching assistants to courses and graduate students to research groups; oversee progress of graduate students within the department; establish and enforce policies; perform all kinds of administrative duties associated with graduate students.

Graduate Student Admission Committee, Chair (2000–2001, 2005-2008); responsible for all recruiting and admission activities for domestic and foreign students; organizing open houses and perspective student visits; reviewed all applications applying to our graduate program.

Graduate Student Recruiting and Admission Committee (2001-2004); responsible for taking pictures for the graduate recruiting brochure, recruiting domestic students and hosting student visits; reviewed about 200 applications per year.

Served on over 60 Oral Exam and Ph. D. thesis Defense Committees for Graduate Students in the Department of Chemistry and Biochemistry

Served on 8 faculty search committees for the Chemistry Department

University Committee

Upper-class Cohort Committee

Undergraduate Admission Committee

UNIVERSITY SERVICE

Radiation Safety Committee (2000-2003)

Michelson-Morley Prize Committee (2001)

Discussion Leader of the Adelbert/Squire Scholarship Program 2002, 2003

Chemical Safety Committee (2012-present)

Advisory Board Member of the Leonard Gelfand STEM Center (2014-present)

COMMUNITY SERVICE

Panelist at the Laurel High School Science Symposium, Shaker Heights, OH, February 6, 2002

Organizer of Martin Luther King Jr. High School Campus Visit to CASE, February 24, 1999

Volunteer in the National Youth Sport Program (NYSP)