

CURRICULUM VITAE
Susan G. Powers-Lee, Ph.D.
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Correspondence Information

Department of Biology
Northeastern University
Boston, Massachusetts 02115
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Education

B.S. in Chemistry, 1969, University of Kentucky
Ph.D. in Biochemistry, 1975, University of California at Berkeley (advisor, Esmond Snell)

Professional Experience

Cornell University Medical College, Department of Biochemistry: Postdoctoral Fellow, 1975-1978 (advisor, Alton Meister); Instructor, 1978-1979; Assistant Professor, 1979-1983
Northeastern University, Department of Biology: Assistant Professor, 1983-1988; Associate Professor, 1988-1999, Professor, 1999-present; Interim Chair of Biology, 2000-2003; Chair of Biology, 2003-2006; Vice Provost for Undergraduate Education, 2006-2007; Executive Vice Provost, 2007-present

Honors

Presidential Scholar, National Merit Scholar; Phi Beta Kappa; NSF Predoctoral Fellowship; NIH Postdoctoral Fellowship; Andrew W. Mellon Teacher-Scientist Award; NIH Career Development Award

Society Memberships

American Society for Biochemistry and Molecular Biology, American Chemical Society; Protein Society

Professional Service

Member, Editorial Board of *Journal of Biological Chemistry*, 1988-1993; 1995-2000; 2004-2009
Member, Editorial Board of *Protein Expression and Purification*, 1990-2007
Reviewer for *Journal of Biological Chemistry*, *Archives of Biochemistry and Biophysics*, *Biochemistry*, *Journal of Molecular Biology*, *Protein Science* and other biochemical journals, 1982-present
Member, Educational Affairs Committee of the American Society of Biochemists and Molecular Biologists, 1986-1989
Member, NIH Special Study Section C3, June, 1985
Special Reviewer, NIH Biomedical Sciences Study Section, January, 1986
Ad hoc reviewer, NIH Biochemistry Study Section, February, 1987
Ad hoc reviewer, NSF instrumentation grants, March, 1987
Ad hoc reviewer, NSF research grants, 1989-present
Ad hoc reviewer, NIH Medical Biochemistry Study Section, June, 1993
Member, NIH Medical Biochemistry Study Section, 7/1/93-6/30/97
Member, NIH Special Emphasis Panel, October, 2000
Member, NIH Special Emphasis Panel, April, 2002
Member, NIH Special Emphasis Panel, March, 2003

Major Research Interests

Regulation of enzyme activity; protein structure/function relationships; protein-protein interactions; mechanisms of enzyme action; domain structure and folding of enzymes

Peer-Reviewed Publications

Kothe, M., Purcarea, C., Guy, H.I., Evans, D.R., and Powers-Lee, S.G., "Direct Demonstration of Carbamoyl Phosphate Formation on the C-terminal Domain of Carbamoyl Phosphate Synthetase," *Protein Science* **14**, 37-44 (2005).

Kothe, M., and Powers-Lee, S.G., "Nucleotide Recognition in the ATP-Grasp Protein Carbamoyl Phosphate Synthetase," *Protein Science* **13**, 466-475 (2004).

Saeed-Kothe, A., and Powers-Lee, S.G. "Gain of Glutamine Function in an Ammonia Specific Carbamoyl Phosphate Synthetase," *J. Biol. Chem.* **278**, 26722-26726 (2003).

Eroglu, B., and Powers-Lee, S.G. "Unmasking a Functional Allosteric Domain in an Allosterically Nonresponsive Carbamoyl Phosphate Synthetase," *J. Biol. Chem.* **277**, 45466-45472 (2002).

Eroglu, B., and Powers-Lee, S.G. "Mutational Analysis of ATP-Grasp Residues in the Two ATP Sites of *Saccharomyces cerevisiae* Carbamoyl Phosphate Synthetase," *Archives Biochem. Biophys.* **407**, 1-9 (2002).

Saeed-Kothe, A., and Powers-Lee, S.G. "Specificity Determining Residues in Ammonia and Glutamine Dependent Carbamoyl-Phosphate Synthetases," *J. Biol. Chem.* **277**, 7231-7238 (2002).

Kothe, M., Eroglu, B., Mazza, H., Samudera, H., and Powers-Lee, S.G. "Novel Mechanism for Carbamoyl-phosphate Synthetase: A Nucleotide Switch for Functionally Equivalent Domains," *Proc. Natl. Acad. Sci. USA* **94**, 12348-12353 (1997).

Zheng, W., Lim, A.L., and Powers-Lee, S.G. "Identification of Critical Amino Acid Residues of *Saccharomyces cerevisiae* Carbamoyl-phosphate Synthetase: Definition of the ATP Site Involved in Bicarbonate Activation," *Biochim. Biophys. Acta* **1341**, 35-48 (1997).

Lim, A.L., and Powers-Lee, S.G. "Critical Roles for Arginine1061/1060 and Tryosine1057 in *Saccharomyces cerevisiae* Arginine-Specific Carbamoyl-phosphate Synthetase," *Arch. Biochem. Biophys.* **339**, 344-352 (1997).

McCudden, C.R., and Powers-Lee, S.G. "Required Allosteric Effector Site for N-Acetylglutamate on Carbamoyl Phosphate Synthetase I," *J. Biol. Chem.* **271**, 18285-18294 (1996).

Lim, A.L., and Powers-Lee, S.G. "Requirement for the Carboxyl-terminal Domain of *Saccharomyces cerevisiae* Carbamoyl Phosphate Synthetase," *J. Biol. Chem.* **271**, 11400-11409 (1996).

Potter, M.D., and Powers-Lee, S.G. "Direct Photoaffinity Labeling of Rat Liver Carbamoyl Phosphate Synthetase I with ATP," *Archives Biochem. Biophys.* **306**, 377-382 (1993).

Potter, M.D., and Powers-Lee, S.G. "Location of the ATP γ -Phosphate Binding Sites on Carbamoyl

Phosphate Synthetase I: Studies with the ATP Analog 5'-p-Fluorosulfonylbenzoyl-adenosine," *J. Biol. Chem.* **267**, 2023-2031 (1992).

Brandt, M., and Powers-Lee, S.G. "The Interaction of Cardiolipin with Rat Liver Carbamoyl Phosphate Synthetase I," *Arch. Biochem. Biophys.* **290**, 14-20 (1991).

Powers-Lee, S.G., Mastico, R.A., and Bendayan, M. "Interaction of Rat Liver Carbamoyl Phosphate Synthetase I and Ornithine Transcarbamoylase with the Inner Mitochondrial Membrane", *J. Biol. Chem.* **262**, 15683-15688 (1987).

Powers-Lee, S.G., and Corina, K., "Photoaffinity Labeling of Rat Liver Carbamoyl Phosphate Synthetase I by 8-Azido-ATP", *J. Biol. Chem.* **262**, 9052-9056 (1987).

Powers-Lee, S.G., and Corina, K., "Domain Structure of Rat Liver Carbamoyl Phosphate Synthetase I", *J. Biol. Chem.* **261**, 15349-15352 (1986).

Miller, N.T., Feibush, B., Corina, K. Powers-Lee, S.G., and Karger, B.L., "High Performance Hydrophobic Interaction Chromatography: Purification of Rat Liver Carbamyl Phosphate Synthetase I and Ornithine Transcarbamylase", *Anal. Biochem.* **148**, 510-517 (1985).

Devaney, M.A., and Powers-Lee, S.G. "Immunological Cross-Reactivity between Carbamyl Phosphate Synthetases I, II and III", *J. Biol. Chem.* **259**, 703-706 (1984).

Powers, S.G., Muller, G.W., and Kafka, N. "Affinity Labeling of Rat Liver Carbamyl Phosphate Synthetase I by 5'-p-Fluorosulfonylbenzoyl Adenosine", *J. Biol. Chem.* **258**, 7545-7549 (1983).

Powers, S.G. "Regulation of Rat Liver Carbamyl Phosphate Synthetase I. Inhibition by Metal Ions and Activation by Amino Acids and Other Chelating Agents", *J. Biol. Chem.* **256**, 11160-11165 (1981).

Powers, S.G., Meister, A., and Haschemeyer, R.H. "Linkage between Self-Association and Catalytic Activity of *Escherichia coli* Carbamyl Phosphate Synthetase", *J. Biol. Chem.* **255**, 2554-2558 (1980).

Wimmer, M.J., Rose, I.A., Powers, S.G., and Meister, A. "Evidence that Carboxy Phosphate is a Kinetically Competent Intermediate in the Carbamyl Phosphate Synthetase Reaction", *J. Biol. Chem.* **254**, 1854-1859 (1979).

Powers, S.G., and Meister, A. "Carbonic-Phosphoric Anhydride (Carboxy Phosphate): Significance in Catalysis and Regulation of Glutamine-Dependent Carbamyl Phosphate Synthetase", *J. Biol. Chem.* **253**, 1258-1265 (1978).

Powers, S.G., and Meister, A. "Mechanism of the Reaction Catalyzed by Carbamyl Phosphate Synthetase; Binding of ATP to the Two Functionally Different ATP Sites", *J. Biol. Chem.* **253**, 800-803 (1978).

Powers, S.G., Griffith, O.W., and Meister, A. "Inhibition of Carbamyl Phosphate Synthetase by Diadenosine Pentaphosphate; Evidence for 2 ATP Binding Sites", *J. Biol. Chem.* **252**, 3558-3560 (1977).

Powers, S.G., and Meister, A. "Identification of Enzyme-Bound Activated Carbon Dioxide as Carbonic-Phosphoric Anhydride: Isolation of the Corresponding Trimethyl Derivative from the Active Site of Glutamine-Dependent Carbamyl Phosphate Synthetase, *Proc. Natl. Acad. Sci. U.S.*, **73**, 3020-3024 (1976).

Powers, S.G., and Snell, E.E. "Ketopantoate Hydroxymethyltransferase. Physical, Catalytic, and Regulatory Properties", *J. Biol. Chem.* **251**, 3786-3793 (1976).

Teller, J.H., Powers, S.G., and Snell, E.E., "Ketopantoate Hydroxymethyltransferase. Purification and Role in Pantothenate Biosynthesis" *J. Biol. Chem.* **251**, 3780-3785 (1976).

Powers, S.G., and Riordan, J.F. "Functional Arginyl Residues as ATP Binding Sites of Glutamine Synthetase and Carbamyl Phosphate Synthetase", *Proc. Natl. Acad. Sci. U.S.* **72**, 2616-2620 (1975).

Reviews and Book Chapters

Powers-Lee, S.G. "A Novel Mechanism for Coupled ATP Use by Functionally and Structurally Equivalent Domains of Carbamoyl-phosphate Synthetase," *Pathways to Pyrimidines* **6**, 29-39 (1998).

Powers-Lee, S.G., and Meister, A. "Urea Synthesis and Ammonia Metabolism", in *Pathobiology of the Liver* (eds. H. Popper, D. Schachter, W.B. Jakoby and I.M. Arias), 2nd edition, Raven Press, New York (1988).

Powers-Lee, S.G. "N-Acetylglutamate Synthase", *Methods in Enzymology* **113**, 27-35 (1985).

Powers, S.G., and Meister, A. "Urea Synthesis and Ammonia Metabolism", in *Pathobiology of the Liver* (eds. H. Popper, D. Schachter, W.B. Jakoby & I.M. Arias), 251-263, Raven Press, NY (1982).

Powers, S.G., and Snell, E.E. "Purification and Properties of Ketopantoate Hydroxymethyltransferase", *Methods in Enzymology* **62**, 204-209 (1979).

Meister, A., and Powers, S.G. "Glutamine-Dependent Carbamyl Phosphate Synthetase: Catalysis and Regulation", *Advances in Enzyme Regulation*, **16**, 289-315 (1978).

Abstracts of Meeting Presentations

Hart, E.J., Ahuja, V. and Powers-Lee, S.G., "Constructing a reporter for the activated conformation of carbamoyl phosphate synthetase," *FASEB J.* **20**, A900 (2006).

Hart, E.J., Ahuja, V. and Powers-Lee, S.G., "Effects of pyrimidine/purine nucleotide effectors on the interaction of human carbamoyl phosphate synthetase I with the required allosteric effector N-acetylglutamate," *FASEB J.* **19**, 803.6 (2005).

Ahuja, V., Saeed-Kothe, A., and Powers-Lee, S.G. "Expression and analysis of polymorphic forms of human CPS I," 19th International Conference on Arginine and Pyrimidines, Marburg, Germany (2004).

Ahuja, V., and Powers-Lee, S.G. "Recombinant expression of Polymorphic Forms of Human Carbamoyl Phosphate Synthetase," *FASEB J.* **18**, 15.32 (2004).

Hart, E.J., and Powers-Lee, S.G. "Probing the Glutamine Site of *Escherichia coli* Carbamoyl Phosphate Synthetase," *FASEB J.* **18**, 15.33 (2004).

Powers-Lee, S.G. "Paths to and from Arginine." Georgia State University Biotech Symposium 2003, June 16-17, Atlanta, Georgia (2003).

Saeed, A., and Powers-Lee, S.G. "Expression, Purification and Gain of Glutamine Function in the Ammonia Specific *Rana catesbeiana* Carbamoyl Phosphate Synthetase," *Protein Science* **12**, Supplement, 278 (2003).

Kothe, M., and Powers-Lee, S.G. "ATP Site Architecture in Carbamoyl Phosphate Synthetase," *Protein Science* **12**, Supplement, 325 (2003).

Saeed, A., and Powers-Lee, S.G. "Gain of Glutamine Function in an Ammonia Specific Carbamoyl Phosphate Synthetase," *FASEB J.*, **17**, 8668 (2003).

Kothe, M., and Powers-Lee, S.G. "Probing Nucleotide Recognition in *Escherichia coli* Carbamoyl Phosphate Synthetase," *FASEB J.*, **17**, 4604 (2003).

Eroglu, B., and Powers-Lee, S.G. "Probing the Functional Distinctions between Homologous ATP Domains of *Saccharomyces cerevisiae* Carbamoyl-Phosphate Synthetase," *FASEB J.*, **14**, 621 (2000).

Saeed, A., and Powers-Lee, S.G. "Roles of Conserved Amidotransferase Residues in Ammonia and Glutamine Dependent Carbamoyl-Phosphate Synthetases," *FASEB J.*, **14**, 620 (2000).

Lim, A.L., and Powers-Lee, S.G. "Vestigial Binding Sites for Nucleotide Allosteric Effectors on CPS I," XVIth International Arginine-Pyrimidine Conference, Leeds, United Kingdom, August, 1998.

Eroglu, B., Kothe, M., Mazza, H.M., Samudera, H., and Powers-Lee, S.G. "Coordinated Utilization of ATP by Carbamoyl-Phosphate Synthetase," *FASEB J.* **11**, 1695 (1997).

Eroglu, B., Kothe, M., Mazza, H.M., Samudera, H., and Powers-Lee, S.G. "Homology Modeling and Site-Directed Mutagenesis Suggest a Novel Mechanism for Carbamoyl-Phosphate Synthetase," *Protein Science* **6**, Supplement, 302 (1997).

Lim, A.L., and Powers-Lee, S.G. "Critical Roles for Arginine1061/1060 and Tryosine1057 in *Saccharomyces cerevisiae* Arginine-Specific Carbamoyl-phosphate Synthetase," XVth International Arginine-Pyrimidine Conference, Pinehurst, North Carolina, August, 1996.

McCudden, C.R., and Powers-Lee, S.G. "Required Allosteric Effector Site on Carbamoyl Phosphate Synthetase I: Apparent Evolution from a Substrate Site", *Protein Science* **4**, Supplement, 299 (1995).

Lim, A.L., and Powers-Lee, S.G. "Contribution of the Flexible C-Terminal Domain to Catalysis and Stability in *S. cerevisiae* Carbamoyl Phosphate Synthetase", *Protein Science* **4**, Supplement, 116 (1995).

Lim, A.L., and Powers-Lee, S.G. "C-Terminal Involvement in the ATP Sites of *S. cerevisiae*

Carbamoyl Phosphate Synthetase", *FASEB J.* **7**, 842 (1993).

Potter, M.D., and Powers-Lee, S.G." Location of the ATP γ -Phosphate Binding Sites on Carbamoyl Phosphate Synthetase I", *FASEB J.* **5**, 1834 (1991).

Potter, M.D., Casey, C.R., and Powers-Lee, S.G. "ATP and N-Acetylglutamate Binding Sites of Rat Liver Carbamoyl Phosphate Synthetase I", *J. Cell Biol.* **107**, 4739 (1988).

Schiff, L, and Powers-Lee, S.G. "Interaction of Bovine Carbamoyl Phosphate Synthetase with Inner Mitochondrial Membranes", *J. Cell Biol.* **107**, 1956 (1988).

Corina, K., and Powers-Lee, S.G. "Photoaffinity Labelling of Rat Liver Carbamoyl Phosphate Synthetase by AzidoATP," *Fed. Proc.* **46**, 2154 (1987).

Powers-Lee, S.G., and Corina, K. "Domain Structure of Rat Liver Carbamoyl Phosphate Synthetase," *Fed. Proc.* **45**, 1544 (1986).

Miller, N.T., Feibush, B., Powers-Lee, S.G., and Karger, B.L. "High Performance Hydrophobic Interaction Chromatography Using Ether-Based Chemically Bonded Phases", 4th International Symposium on HPLC of Proteins, Peptides, and Polynucleotides, #104, Baltimore, MD, 1984.

Devaney, M. and Powers-Lee, S.G. "Interaction of Carbamyl Phosphate Synthetase I with Glutamate Dehydrogenase", *Fed. Proc.* **42**, 2040 (1983).

Powers, S.G. "Rat Liver Carbamyl Phosphate Synthetase I. Mechanism of Activation by Amino Acids", *Fed. Proc.* **40**, 384 (1981).

Powers, S.G., and Haschemeyer, R. H. "Tetrameric, Dimeric and Monomeric Carbamyl Phosphate Synthetase", *Fed. Proc.* **38**, 505 (1979).

Powers, S.G., and Meister, A. "Correlation of Catalytic and Physical Properties of Glutamine Dependent Carbamyl Phosphate Synthetase", *Fed. Proc.* **36**, 874 (1977).

Powers, S.G., and Meister, A. "ATP-Dependent Activation of Carbon Dioxide by Carbamyl Phosphate Synthetase: Evidence for a Mixed Anhydride between Carbonic and Phosphoric Acids", *Fed. Proc.* **35**, 1433 (1976).

Powers, S.G., and Snell, E. E. "Ketopantoate Hydroxymethyltransferase from *E. coli* K-12", *Fed. Proc.* **33**, 871 (1974).

Active Grant Support

NSF, "LSAMP, Phase 2," PI, 2006-2011, \$66,000 direct costs for 2006-2007

Davis Educational Foundation, "University-wide electronic early warning system," PI, 2005-2008,

\$275,978 direct costs

Past Grant Support

NSF, "Development and Assessment of Integrated Learning in Biology and Computer Science," 5%

effort, 2003-2006, \$498,276

NIH, "Catalysis and Regulation of the Urea Cycle", PI, 1998-2005, \$922,725
Northeastern University Research and Scholarship Development Fund, "Expression and Preliminary Characterization of Human Carbamoyl Phosphate Synthetase", PI, 2003-2004, \$4600
Northeastern University Teaching with Technology Fund, "IgotBiology: Biology Learning at Internet Speed," Co-PI, 2001-2003, \$25,000
Northeastern University President's Excellence Fund, "An Integrated Education Center for the Department of Biology," Co-PI, 2001-2003, \$100,000
Northeastern University Instructional Development Fund, "Enhancement of Biology 1494: Experiential Education Capstone in Biology," Co-PI, 2000, \$3,000.
Northeastern University Faculty Development "Effective Thinking and Effective Communication in the Context of the Natural World," Co-PI, 1997-1999, \$9700
Northeastern University Research and Scholarship Development Fund, "Homology Modeling of Carbamoyl Phosphate Synthetase", PI, 1996-1997, \$4500
Northeastern University Faculty Development, "Incorporating ACE Objectives in the Biochemistry Curriculum", PI, 1997, \$960
NIH, "Regulation of the Activity of the Urea Cycle", PI, 1992-1996, \$586,276
NIH, "Regulation of the Activity of the Urea Cycle", PI, 1987-1992, \$832,355
NIH, Research Career Development Award, PI, 1984-1989, \$242,733
Northeastern University Research and Scholarship Development Fund, "Sequence Analysis of Carbamoyl Phosphate Synthetase", PI, 1987-1988, \$4,000
Northeastern University Biomedical Research Support Grant, "Immunocytochemical Studies of Mitochondrial Enzymes", PI, 1986-1987, \$1,000
NIH, "Regulation of the Activity of the Urea Cycle", PI, 1984-1987, \$188,262
Northeastern University Instructional Development Fund, "Development of Advanced Biochemistry Laboratory", Co-PI, 1984-1985, \$7,058
Northeastern University Research and Scholarship Development Fund, "Regulation of Urea Cycle Activity", PI, 1984-1985, \$3,520
Northeastern University Research and Scholarship Development Fund, "Regulation of Urea Cycle Activity", PI, 1983-1984, \$2,000
NIH, "Regulation of the Activity of the Urea Cycle", PI, 1981-1984, \$184,583
American Chemical Society Petroleum Research Fund, Type G, "Protein-protein Interactions within the Mitochondrial Matrix and their Role in Urea Cycle Regulation", PI, 1980-1983, \$10,000
Cornell University Medical College Biomedical Research Support Grant, "Urea Cycle Regulation", PI, 1980-1981, \$4,500
Andrew W. Mellon Teacher Scientist Award, "Urea Cycle Regulation", PI, 1980-81, \$17,500

TEACHING

Cornell University Medical College: coordinator of graduate biochemistry course, 1980-1983; lecturer for graduate and medical biochemistry courses, 1979-1983; major advisor for one graduate student and minor advisor for six graduate students

Northeastern University Courses

BIO 1001, Introduction to the Biology Major. Study skills, available resources, courses, etc. (1QH)

BIO 1103, Introduction to Biology (with lab). Emphasized an understanding the basic principles of cell biology and the style of scientific thought that led to elucidation of these principles. The Honors section met weekly to discuss readings from the primary literature. (4QH)

BIO 1460, Current Topics in Cell Biology. For this team-taught course, I developed a series of

lectures on noncovalent macromolecular assemblies. (4QH)

BIO 1480/1490, Senior Biochemistry/Biology Seminar. I have developed seminars based on *The Medical Detectives* by Berton Rouche, on *Recombinant DNA* by Watson *et al.* and on the mini-review compendium of *The Journal of Biological Chemistry*; these seminars were designed to teach specific areas of biology, general approaches to research questions, and presentation skills. (1QH)

BIO 1491, 1492, Directed Study, 15-20 hours/week. This course involves intensive tutoring and research direction of undergraduate students, and was designed to teach them specific areas of biochemistry and general approaches to experimentation. (2QH)

BIO 1494, Capstone in Biology. This course integrates and assesses the concepts and skills acquired from the entire undergraduate curriculum, including experiential and classroom based components. It requires reflection on the various educational experiences, written summaries of the reflections, extensive research on specific questions related to the experiences and presentation (e.g., oral, poster and/or web page) of the research. (4QH)

BIO 1495. Junior/Senior Honors Project, 15-20 hours/week. This course involves intensive tutoring and research direction of undergraduate students, and was designed to teach them specific areas of biochemistry and general approaches to experimentation. (2QH)

BIOU 323/324 (renumbering of BIO 1261/1281; BIO1283), Introductory Biochemistry (with lab). I designed this syllabus with an emphasis on the structure/function relationships in biochemistry, and redesigned the labs to incorporate state-of-the art experiments in biochemistry; graduate students may take this course, without the lab, for 2 qh of credit as BIO 3561. Until 1996, honors students could take a 1 QH adjunct to this course which met weekly to discuss readings from the primary literature. (5SH)

BIO 3563 (renumbering of BIO 3567), Graduate Biochemistry Laboratory, an 8-hour/week laboratory session and 2 hours of lecture and discussion/week. This course was co-taught with Professor Kostia Bergman and was developed by us in the Fall of 1984. It served primarily entering graduate students, and was designed to provide hands-on experience in modern techniques of protein and nucleic acid biochemistry. I created the lab manual for half of the course. (4QH)

BIO 3567,3568,3569, Biology Laboratory Rotations, 15-20 hours/week. This course involves intensive tutoring and research direction of individual graduate students, and was designed to teach them specific areas of biochemistry and general approaches to experimentation. (3QH)

BIO 3566, Cellular Aspects of Biochemistry, team-taught by members of the biochemistry track. I developed a series of lectures on the biochemistry of prostaglandins and lipoproteins. (4QH)

BIO 3680, Advanced Topics in Biochemistry (renumbering of BIO 3712). I developed this course to serve as a second-tier course for graduate students in the area of biochemistry, cell and molecular biology who wished to pursue an in-depth analysis of protein structure. (3QH)

BIO 3681, Advanced Topics in Molecular Biology. I developed this course to serve as a second-tier course for graduate students in the area of biochemistry, cell and molecular biology who wished to pursue an in-depth analysis of the genome and proteome. (3 QH)

BIO 3690/3790. Graduate Seminar; I developed a seminar on the biology of vision in Winter 1985 and redesigned the course in Winter 1987 to cover in more depth the biochemistry of vision; I organized the Current Research in Biochemistry Graduate Seminar for 1994-1995, with an emphasis on discussing current primary literature in the area of biochemistry, and on discussing student research-in-progress. (1QH)

BIOG 502. Directed Readings in Biology (renumbering of BIO 3713, BIO 3753); this course involves intensive tutoring and research direction of graduate students, and was designed to teach them specific areas of biochemistry and general approaches to experimentation. (2SH)

BIOU 409. Current Topics in Biology; I developed a course on genes and diet. (4SH)

Northeastern University Teaching, with enrollment indicated parenthetically:

<u>Year</u>	<u>Fall</u>	<u>Winter</u>	<u>Spring</u>	<u>Summer</u>
1984-85	3567 (12)	3690 (8) 3667 (1)	3668 (2)	
1985-86	3567 (11) 1490 (7)	1460 (5) 3667 (1)	3668 (2) 1491 (1)	1492 (1)
1986-87	3563 (11) 3690 (10)	3667 (1)	3566 (8) 3668 (1)	3667 (1)
1987-88	3563 (11)	1490 (14)	3566 (16)	
1988-89	3563 (13)	1460 (5) 3667 (1) 3713 (1)	3566 (14) 3668 (1)	
1989-90	1103 (84) Honors 1103 (11)	3690 (7)	3668 (1)	
1991-92	1103 (83) Honors 1103 (12)	1491 (1)	3713 (1)	
1992-1993	3712 (13)	1490 (13) 3667 (1)	1261 (17)	
1993-1994	1490 (5)		1261 (29) Honors 1261 (5) 1491 (1)	1491 (1)
1994-1995	3690 (23)	3690 (17)	1261 (16) Honors 1261 (2) 3690 (8)	3668 (1)
1995-1996	3680 (10) 3753 (3)		1281 (45) 1480 (11)	1495 (1)

	3790 (5)		3668 (1) 1495 (1)	
1996-1997	1480 (1)	3681 (7) 1495 (1)	1281 (41) 1495 (1) 3790 (19)	1281 (24)
1998-1999		1494 (13) 3668 (1)	1283 (60) 3668(1)	1283 (26)
1999-2000	1494 (25) 1001 (20)		1283 (60)	
2000-01	1494 (19)		1494 (30)	
2001-02	1494 (35)			
2002-03	3744 (2)	3742 (1)		
2003-04	U323/4 (26) G502 (1)			
2004-2005	U100 (23)			U409 (22)
2005-2006	U100 (19) U409 (27)			

Northeastern University Research Supervision

Margaret Devaney: Protein interactions involving carbamoyl phosphate synthetase I. Ph.D. (from Cornell University) awarded 1984.

Karen Corina: Domain structure of carbamoyl phosphate synthetase I. MS awarded 1987.

Frederick Luh: Novel probes of conformation and self-association states of carbamoyl phosphate synthetase I. M.S. awarded 1988.

Leora Schiff: Characterization of the interaction between bovine liver carbamoyl phosphate synthetase I and the mitochondrial inner membrane. M.S. awarded 1990.

Daniel Potter: Location of the ATP γ -phosphate binding sites on carbamoyl phosphate synthetase I. Ph.D. awarded 1991.

Hong Zhou: C/EBP α , a tissue-specific transcription factor. M.S. (literature) awarded 1995.

Angela Lim: Requirement for the carboxyl-terminal domain of *Saccharomyces cerevisiae* carbamoyl phosphate synthetase. Ph.D. awarded 1996.

Holly Mazza: Selective protein degradation: recognition of substrates by the ubiquitin-mediated proteolytic system. M.S. (literature) awarded 1996.

Weihong Zheng: Identification of critical amino acid residues of *Saccharomyces cerevisiae* carbamoyl phosphate synthetase: definition of the ATP site involved in bicarbonate activation, M.S. awarded 1996.

Tonya Barrett: The role of IL-8 as a proinflammatory cytokine in infectious disease, M.S. (literature) awarded 1996.

Kimberley Gurnett: The role of glucose regulated protein 78 in protein trafficking and secretion, M.S. (literature) awarded 1997.

Michael Kothe: Definition of critical residues in domain C of yeast carbamoyl-phosphate synthetase

- by site-directed mutagenesis. M.S. awarded 1997.
- Alison Botka: Structure and function of diphtheria toxin-related fusion proteins. M.S. (literature) awarded 1998.
- Christine Nelson: The neurodevelopmental hypothesis as one possible explanation for schizophrenia. M.S. (literature) awarded 1999.
- Michael Burgess: Metastability of viral surface glycoproteins involved in membrane fusion. M.S. (literature) awarded 2001.
- Binnur Eroglu: Allosteric regulation of chimeric carbamoyl-phosphate synthetases and Identification of amino acid residues critical for enzymatic activity. Ph.D. awarded 2002.
- Michael Kothe: Nucleotide recognition in carbamoyl phosphate synthetase. Ph.D. awarded 2003.
- Amna Saeed: Teaching an old enzyme a new trick: glutaminase function in *Escherichia coli* and *Rana catesbeiana* carbamoyl phosphate synthetases. Ph.D. awarded 2003.
- Vibha Ahuja: Expression and analysis of human carbamoyl phosphate. Ph.D. awarded 2005.
- Jennifer Stover: Contributions of gene expression profiling to biological and clinical aspects of acute myeloid leukemia. M.S. (literature) awarded 2005.
- Emily Hart: Catalysis by the amidotransferase domain of carbamoyl phosphate synthetase. Ph.D. awarded 2007.
- Judy Richman: ErbB-2 as a cancer therapeutic target. M.S. (literature) project started 2005.
- James McAlinden, B.S. student: Potential interaction of thioredoxin with carbamoyl phosphate synthetase I. Directed study, Spring and Summer 1986.
- Monika Rose, M.S. student: Potential interaction of glutamate dehydrogenase with carbamoyl phosphate synthetase I. Special investigations, Spring 1989.
- Hua Yang, B.S. student: Effects of organic solvents on the conformation of carbamoyl phosphate synthetase. Directed Study, Winter 1992 and Summer 1994.
- Derek Rappaport, B.S. student: Construction of a bacterial expression vector for yeast carbamoyl phosphate synthetase. Directed study, Spring 1994.
- Robyn Moore, guest high school teacher, NIH Minority High School Apprenticeship Program. Summer, 1994.
- Martin LeQuesne, B.S. student: PCR-based mutagenesis of domain C of carbamoyl phosphate synthetase. Spring and Summer, 1996.
- Christina Vassileva, Junior/Senior Honors Project: Site-direct mutagenesis as a probe of the structure of the enzyme carbamoyl-phosphate synthetase. Winter and Spring, 1997.

Northeastern University Thesis Committees

- Neil Miller, Ph.D. in Chemistry awarded 1985
- Beverly Warden, Ph.D. in Medicinal Chemistry awarded 1985
- Shiaw-Lin Wu, Ph.D. in Chemistry awarded 1986
- Russell Garlick, Ph.D. in Medicinal Chemistry awarded 1987
- Elaine Palome, M.S. in Biology awarded 1987
- Mary-Ann Brandt, M.S. in Biology awarded 1988
- Paul Ronco, M.S. in Biology awarded 1988
- Steve Schillinger, M.S. in Biology awarded 1988
- Tracy Walton, M.S. in Biology awarded 1988
- Ilse Rieger, M.S. in Biology awarded 1989
- Melanie Harasym, Ph.D. in Biology awarded 1990
- Mary Hoffee, M.S. in Biology awarded 1990
- Hans Stuting, Ph.D. in Chemistry awarded 1990
- Ling Wu, M.S. in Biology awarded 1990
- Michael Healey, M.S. in Biology awarded 1992
- Li-hong Zhang, Ph.D. in Biology awarded 1992

Jian-Ping Gao, M.S. in Biology awarded 1993
Sandy Murray, Ph.D. in Biology awarded 1993
David Newsome, M.S. in Biology awarded 1994
Shari Ackerman-Morris, M.S. in Biology awarded 1995
Nina Andres, M.S. in Biology awarded 1995
Claudia Cabral, M.S. in Biology awarded 1995
Manoja Ratnayake, M.S. in Biology awarded 1995
JoAnne Siperas, M.S. in Biology awarded 1995
Somya Bhargava, M.S. in Biology awarded 1996
Donald Girouard, M.S. in Biology awarded 1996
Malvika Koundinya, M.S. in Biology awarded 1996
Maureen Lane, Ph.D. in Biology awarded 1997
Amna Saeed, M.S. in Biology awarded 1997
Mouris Saghir, Ph.D. in Biomedical Sciences awarded 1997
Wei Yang, M.S. in Biology awarded 1997
Yuqiong Zhao, M.S. in Biology awarded 1997
Edward Reverdy, Ph.D. in Biomedical Sciences awarded 1998
Dorota Bulik, Ph.D. in Biology awarded 1999
Dan Carey, M.S. in Biology awarded 1999
Weihua Chen, M.S. in Biology awarded 1999
Abigail McElhinny, Ph.D. in Biology awarded 1999
Cynthia Reeves, M.S. in Biology awarded 1999
Lizi Wu, Ph.D. in Biology awarded 1999
Charlene Repique, Ph.D. in Biomedical Sciences awarded 1999
Ming-Chyuan Chen, Ph.D. in Biology awarded 1999
Stefan Girgenrath, Ph.D. in Biology awarded 2000
Dana Pedersen, Ph.D. in Biomedical Sciences awarded 2000
Feng Feng, M.S. in Biomedical Sciences awarded 2000
Lubna Kazi, Ph.D. in Biology awarded 2001
Marc Pelletier, M.S. in Biology awarded 2001
Judy Triolo, M.S. in Biology awarded 2001
Michael Fattal, M.S. in Biology awarded 2002
Ali Hasaba, Ph.D. in Biomedical Sciences awarded 2002
Rita Droste, M.S. in Biology awarded 2003
Marie Amato, M.S. in Biology awarded 2003
Donald Yergeau, Ph.D. in Biology awarded 2003
Chad Yasuda, Ph.D. in Biology awarded 2004
Devang Shah, Ph.D. in Biology awarded 2005
Amy Spoering, Ph.D. in Biology awarded 2005
Essam Alyamani, Ph.D. in Biomedical Sciences awarded 2006
Stephen Hann, Ph.D. in Biology awarded 2006
Keriman Sener, Ph.D. in Biology awarded 2006
Xuena Lin, M.S. in Biology awarded 2006
Alexej Abysov, Ph.D. student in Biology

SERVICE

Intramural committees at Cornell University Medical College: At-large representative to General Faculty Council, 1982-1983; member of departmental graduate admissions committee, 1980-1983; departmental seminar coordinator, 1980-1983

Intramural committees at Northeastern University

- 1983-1984: Biochemistry Search Committee
Ad hoc Curriculum Review Committee
- 1984-1985: Ph.D. Qualifying Examination Committee
Biochemistry Search Committee
Physiology Search Committee
Freshman Advising Committee
- 1985-1986: Graduate Committee
Admissions Subcommittee of Graduate Committee (chair)
Ph.D. Qualifying Examination Committee
Biochemistry Search Committee
- 1986-1987: Graduate Committee (secretary)
Admissions Subcommittee of Graduate Committee (chair)
Ph.D. Qualifying Examination Committee
Marine Biology Search Committee
Ad hoc Development Committee for Undergraduate Biochemistry Major
- 1987-1988: Executive Committee
Graduate Committee
Admissions Subcommittee of Graduate Committee (chair)
Ph.D. Qualifying Examination Committee (chair)
Colloquium and Visiting Scientist Committee
University Library Committee
Ad hoc Review Committee for Chemistry Dept.
- 1988-1989: Acting Associate Chairperson
Executive Committee
Coordinator of Biochemistry, Cell and Molecular Biology Group
Lowell Visiting Professors Committee (chair)
Colloquium and Visiting Scientist Committee
University Library Committee
University Honors Program Committee
University Search Committee for Director of Research Management
University Radiological Safety Committee
- 1989-1990: Acting Associate Chairperson
Graduate Coordinator and Chair, Graduate Committee
Executive Committee
Lowell Visiting Professors Committee (chair)
Coordinator of Biochemistry, Cell and Molecular Biology Group
University Radiological Safety Committee
- 1990-1991: Sabbatical
- 1991-1992: Acting Associate Chairperson
Graduate Coordinator and Chair, Graduate Committee
Retreat Planning Committee
College of Arts and Sciences Planning and Priorities Committee

University Radiological Safety Committee
University Engineering Science Building Planning Committee

- 1992-1993: Graduate Coordinator and Chair, Graduate Committee
Recruiting and Public Relations Committee (chair)
Faculty Search Committee
CAS Strategic Planning Task Force on Graduate Education
University Graduate Council
University Radiological Safety Committee
- 1993-1994: Graduate Coordinator and Chair, Graduate Committee
Recruitment and Public Relations Committee (chair)
Coordinator, Biochemistry, Cell and Molecular Biology Group
University Graduate Council
University Strategic Plan Implementation Committee
University Joint Undergraduate-Graduate Review Committee
University Radiological Safety Committee
- 1994-1995: Graduate Coordinator and Chair, Graduate Committee
Recruitment and Public Relations Committee (chair)
Faculty Search Committee (chair)
Coordinator, Biochemistry, Cell and Molecular Biology Group
Curriculum Committee
Graduate Academic Standing Committee, College of Arts and Sciences
University Graduate Council
University Strategic Plan Implementation Committee
University Radiological Safety Committee
- 1995-1996: Graduate Committee
Standards Subcommittee of the Graduate Committee (chair)
Curriculum Committee
University Radiological Safety Committee
- 1996-1997: Executive Committee
Curriculum Committee (chair)
Graduate Committee
Standards Subcommittee of the Graduate Committee (chair)
University Radiological Safety Committee
- 1997-1998: Sabbatical, half-year
College Council
Microbiology/Molecular Biology Faculty Search Committee
Faculty Developer, Summer Science and Mathematics Camp for Middle Schools
- 1998-1999: Executive Committee
Curriculum Committee (chair)
Experiential Education Advisor
College Council
University Radiological Safety Committee
- 1999-2000: Executive Committee

Curriculum Committee (chair)
Microbiology Faculty Search Committee (chair)
Experiential Education Advisor
Faculty Senate
University Radiological Safety Committee
University Student Appeals Resolution Committee

2000-2001: Interim Chair, Department of Biology
Curriculum Committee (co-chair)
Microbiology Faculty Search Committee (chair)
College of Arts and Sciences Tenure and Promotion Committee
College of Arts and Sciences Distinguished Professorship Committee
Faculty Senate
Financial Affairs Subcommittee, Faculty Senate
University Research Council

2001-2002: Interim Chair, Department of Biology
Curriculum Committee (co-chair)
College of Arts and Sciences Tenure and Promotion Committee
Faculty Senate
Academic Policy Subcommittee, Faculty Senate (chair)
University Research Council

2002-2003: Interim Chair, Department of Biology
Curriculum Committee (co-chair)
College of Arts and Sciences Tenure and Promotion Committee
Agenda Committee, CAS Chairs Council
Faculty Senate
University Research Council
Search Committee, Vice-President, Cooperative Education
Search Committee, Vice-Provost, Graduate Education

2003-2004 Chair, Department of Biology
Curriculum Committee (co-chair)
College of Arts and Sciences Tenure and Promotion Committee
Agenda Committee, CAS Chairs Council
University Biotechnology Advisory and Management Committee
University Biotechnology Scientific Committee
Search Committee, Vice-Provost, Research (chair)

2004-2005 Chair, Department of Biology
Curriculum Committee (co-chair)
Faculty Senate
University Biotechnology Advisory and Management Committee
University Biotechnology Scientific Committee
University Academic Classroom Committee
Faculty Senate Marshall Evaluation Committee (chair)

2005-2006 Chair, Department of Biology
Curriculum Committee (co-chair)
Faculty Senate

Faculty Senate Agenda Committee
Faculty Senate *ad hoc* Committee on the Calendar
University Biotechnology Advisory and Management Committee
University Biotechnology Scientific Committee
University Academic Classroom Committee
Institutional Master Plan Working Group on Teaching Laboratories
College of Arts and Sciences Tenure and Promotion Committee

2006-2007 Co-Chair, University Experiential Learning Strategic Planning Committee
Chair, University Undergraduate Curriculum Committee
Faculty Senate