CURRICULUM VITAE

Paul Andrew Karplus

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Education

University of California, Berkeley, CA			
University of California, Davis, CA	B.S.	1978	Biochemistry
University of Washington, Seattle, WA	Ph.D.	1984	Biochemistry
University of Freiburg, Freiburg, Germany	Postdoc	1984-1988	

Professional Experience

1978 - 84	Doctoral student with Drs. Kenneth A. Walsh and Jon R. Herriott; Department of Biochemistry, University of Washington.
1984 - 88	Post-doctoral researcher with Dr. Georg E. Schulz, Institute for Organic Chemistry and Biochemistry, University of Freiburg, Germany
7/88 - 6/93	Asst. Prof. of Biochemistry, Molecular and Cell Biology, Cornell University
7/93 - 8/98	Assoc. Prof. of Biochemistry, Molecular and Cell Biology, Cornell University
8/95 - 6/96	Visiting Professor of Biochemistry and Biophysics, Oregon State University
8/98 - 6/99	Associate Professor of Biochemistry and Biophysics, Oregon State University
6/07 - 12/10	Chair of Biochemistry and Biophysics, Oregon State University
7/15 – 12/19	Head of Biochemistry and Biophysics, Oregon State University
7/99 - present	Professor of Biochemistry and Biophysics, Oregon State University

Awards and Honors

1978	B.S. in Biochemistry with highest honors
1978	Member Phi Kappa Phi honorary fraternity
1979	National Research Service Award (NIH-NIGMS)
1984-1985	Alexander von Humboldt Fellow (U. Freiburg)
1990-July	Alexander von Humboldt Fellow (U. Freiburg)
1996	Pfizer Award in Enzyme Chemistry
1996-1997	Guggenheim Fellowship
2001	OSU College of Science Milton Harris Award for Basic Research
2005	OSU Sigma Xi Researcher of the Year
2011-May	Alexander von Humboldt Fellow (U. Konstanz)
2012,14	OSU Mortar Board Society Top Prof Award (2012-Ireton; 2014-Tolmach)
2012	OSU College of Science F.A. Gilfillan Memorial Award for Distinguished Scholarship in Science
2013	Oregon Medical Research Foundation Discovery Award
2014	Elected AAAS Fellow
2015	OSU Distinguished Professor

Refereed Publications

1. Morris HR, Panico M, Karplus A, Lloyd PE & Riniker B (1982) Elucidation by FAB-MS of the structure of a new cardioactive peptide from *Aplysia*. *Nature* **300**, 643-645.
2. Karplus PA, Walsh KA & Herriott JR (1984) Amino acid sequence of spinach ferredoxin:NADP oxidoreductase. *Biochemistry* **23**, 6576-6583.
3. Karplus PA & Schulz GE (1985) Prediction of chain flexibility in proteins: A tool for the selection of peptide antigens. *Natur Wissenschaften* **72**, 212-213.
4. Karplus PA & Schulz GE (1987) The refined structure of glutathione reductase at 1.54 Å resolution. *J Mol Biol* **195**, 701-729.
5. Dreusicke D, Karplus PA & Schulz GE (1988) Refined structure of porcine cytosolic adenylate kinase at 2.1 Å resolution. *J Mol Biol* **199**, 359-371.
6. Karplus PA, Krauth-Siegel RL, Schirmer RH & Schulz GE (1988) Inhibition of human glutathione reductase by the nitrosourea drugs BCNU and HeCNU: A crystallographic analysis. *Eur. J Biochemistry* **171**, 193-198.
7. Pai EF, Karplus PA & Schulz GE (1988) Crystallographic analysis of the binding of NADPH, NADPH fragments, and NADPH analogues to glutathione reductase. *Biochemistry* **27**, 4465-4474. (PMID: 2844232)
8. Karplus PA, Pai EF & Schulz, GE (1989) A crystallographic study of the glutathione binding site of glutathione reductase at 0.3 nm resolution. *Eur J Biochem* **178**, 693-703. (PMID: 2912729)
9. Karplus PA & Schulz GE (1989) Substrate binding and catalysis by glutathione reductase as derived from refined enzyme: substrate crystal structures at 2 Å resolution. *J Mol Biol* **210**, 163-180. (PMID: 2585516)
10. Karplus PA, Daniels MJ & Herriott JR (1991) Atomic Structure of Ferredoxin:$NADP^+$ Oxidoreductase; Prototype for a Structurally Novel Flavoenzyme Family. *Science* **251**, 60-66. (PMID: 1986412)
11. Van Duyne GD, Standaert RF, Karplus PA, Schreiber SL & Clardy J (1991) Atomic Structure of FKBP-FK506, an Immunophilin-Immuno-suppressant Complex. *Science*, **252**, 839-842. (PMID: 1709302)
12. Diederichs K, Jacques S, Boone T & Karplus PA (1991) Low Resolution Structure of Recombinant Human Granulocyte-Macrophage Colony Stimulating Factor. *J Mol Biol* **221**, 55-60. (PMID: 1920418)
13. Diederichs K, Boone T & Karplus PA (1991) Novel Chain-fold and Putative Receptor Binding Site of Granulocyte-Macrophage Colony-Stimulating Factor. *Science* **254**, 1791-1794. (PMID: 1837174)
14. Jabri E, Lee, MH, Hausinger RP & Karplus PA (1992) "Preliminary crystallographic studies of Urease from Jack Bean and from *Klebsiella aerogenes*" *J Mol Biol,* **227,** 934-937.
15. van Duyne GD, Standaert RF, Karplus PA, Schneiber SL & Clardy J (1993) Atomic Structures of the Human Immunophilin FKBP-12 Complexes with FK-506 and Rapamycin. *J Mol Biol*, **229,** 105-124.
16. Spezio M, Wilson DB & Karplus PA (1993) "Crystal Structure of the Catalytic Domain of a Thermophilic Endocellulase" *Biochemistry*, **32**, 9906-9916.
17. Fox KM & Karplus PA (1993) "Crystallization of Old Yellow Enzyme Illustrates an Effective Strategy for Increasing Protein Crystal Size" *J Mol Biol* **234***,* 502-507.
18. Cornell CC, Ludwig ML, Bruns CM & Karplus PA (1993) "Structural Prototypes for an Extended Family of Flavoprotein Reductases: Comparison of Pthalate Dioxygenase Reductase with Ferredoxin Reductase and Ferredoxin" *Protein Sci* **2**, 2112-2133.
19. Cha J, Cho Y, Whitaker R, Carrell HL, Glusker JP, Karplus PA & Batt C (1994) "Perturbing the Metal Site in D-Xylose Isomerase: Effect of Mutations of His-220 on Enzyme Activity" *J Biol Chem* **269**, 2687-2694.

20. Rozwarski D, Gronenborne A, Clore M, Bazan F, Bohm A, Wlodawer A, Hatada M & Karplus PA (1994) "Structural Comparisons among the Short-Chain Helical Cytokines" *Structure* **2**, 159-173.
21. Fox KM & Karplus PA (1994) "Old Yellow Enzyme at 2 Å resolution: overall structure, ligand binding, and comparison with related flavoproteins" *Structure* **2**,1089-1105.
22. Bruns CM & Karplus PA (1995) "Refined structure of Ferredoxin: $NADP^+$ Reductase at 1.7Å resolution" *J Mol Biol* **247**, 125-145.
23. Strickland, C., Puchalski, R., Savvides, S., Karplus PA (1995) "Overexpression of *Crithidia fasciculata* trypanothione reductase: Kinetic Characterization and Crystallization Using a Novel Geometry" Acta Cryst sect D**51**, 337-341.
24. Lee AY, Karplus PA, Ganem BG & Clardy JC (1995) "Atomic structure of the buried catalytic pocket of *Escherichia coli* chorismate mutase." *J Am Chem Soc* **117**, 3627-3628.
25. Jabri E, Carr, M.B., Hausinger, R.P. & Karplus PA (1995) "The crystal structure of urease from *Klebsiella aerogenes* " *Science* **268**, 998-1004.
26. Aliverti, A., Bruns, CM PAndini, V.E., Karplus,PA, Vanoni, M.A., Curti, B. & Zanetti, G. (1995) "Involvement of Ser96 in the catalytic mechanism of ferredoxin-NADP+ reductase: Structure-function relationship as studied by site-directed mutagenesis and x-ray crystallography" *Biochemistry* **34**, 8371-8379.
27. Whitaker RD, Cho Y, Cha J, Carrell HL, Glusker JP, Karplus PA & Batt CA (1995) "Probing the roles of active site residues in D-xylose isomerase" *J Biol Chem* **270**, 22895-22906.
28. Faerman, CH & Karplus PA (1995) "Consensus preferred hydration sites in six FKBP12-drug complexes" *Proteins: Strucure, Function and Genetics* **23**, 1-11.
29. Carr, M.B., Hom, L.G., Jabri E, Karplus, P.A, & Hausinger, R.P. (1995) "Urease activity in the crystalline state" *Protein Sci* **4**, 2234-2236.
30. Ponasik, JA., Strickland, C.L., Faerman, CH, Savvides, S., Karplus PA & Ganem, B.(1995) "Kukoamine A and other hydrophobic acylpolyamines: potent and selective inhibitors of *Crithidia fasciculata* trypanothione reductase." Biochem J **311**, 371-375.
31. Savvides S & Karplus PA (1996) "Kinetics and crystallographic analysis of human glutathione reductase in complex with a xanthene inhibitor" *J Biol Chem* **271**, 8101-8107.
32. Park I-S, Michel LO, Pearson MA, Jabri E, Karplus PA, Wang S, Dong J, Scott RA, Koehler BP, Johnson MK & Hausinger RP (1996) "Characterization of the mononickel metallocenter in H134A mutant urease" *J Biol Chem* **271**, 18632-18637.
33. Karplus PA (1996) "Experimentally observed conformation-dependent geometry and hidden strain in proteins" *Protein Sci* **5**, 1406-1420.
34. Sakon J, Adney WS, Himmel ME, Thomas SR, Karplus PA (1996) "Crystal structure of thermostable family 5 endocellulase E1 from *Acidothermus cellulolyticus* in complex with cellotetraose" *Biochemistry* **35**, 10648-10660.
35. Jabri E & Karplus PA (1996) "Structures of the *Klebsiella aerogenes* urease apoenzyme and two active site mutants" *Biochemistry* **35**, 10616-10626.
36. Faerman CH, Ponasik JA, Savvides S, Strickland CL, Ganem B, Ripoll DR & Karplus PA (1996) "Tricyclic ihibitors of human glutathione reductase and of *Crithidia fasciculata* trypanothione reductase: a tale of two enzymes" *Bioorg. Med. Chem* **4**, 1247-1253.
37. Rozwarski, D., Diederichs, K., Hecht, R., Boone, T. & Karplus PA (1996) "Refined crystal structure and mutagenesis of human granulocyte-macrophage colony-stimulating factor" *Proteins* **26**, 304-313
38. Diederichs, K. & Karplus PA (1997) "Improved R-factors for diffraction data analysis in macromolecular crystallography" *Nat Struct Biol* 4, 269-275 & 592.
39. Karplus PA (1997) "Hydrophobicity regained" *Protein Sci* **6**, 1302-1307.

40. Liu Q, Schmidt RK, Teo B, Karplus PA, & Brady JW (1997) "Molecular dynamics studies of the hydration of α,α-trehalose" *J Am. Chem Soc.* **119**, 7851-7862.
41. Pearson MA, Michel LO, Hausinger RP, & Karplus PA (1997) "Structures of Cys319 variants and acetohydroxamate inhibited *Klebsiella aerogenes* urease" *Biochemistry* **36**, 8164-8172.
42. Raychaudhuri S, Younas F, Karplus PA, Faerman CH, & Ripoll D (1997) "Backbone makes a significant contribution to the electrostatics of α/β-barrel proteins." *Protein Sci* **6**, 1849-1857. (PMID: 9300484)
43. Sakon J, Irwin D, Wilson DB, & Karplus PA (1997) "Structure and mechanism of endo/exocellulase E4 from *Thermomonospora fusca*" *Nat Struct Biol* **4**, 810-818.
44. Fournet A, Inchausti A, Yalouff G, Rojas de Arias A, Guinaudeau H, Bruenton J, Breidenbach M, Karplus PA & Faerman C (1998) "Trypanocidal bisbenzylisoquinoline alkaloids are inhibitors of trypanothione reductase" *J Enzyme Inhib.* **13**, 1-9.
45. Vargas L, Kawada ME, Bazaes S, Karplus PA, & Faerman C (1998) "Insulin antagonism: a novel role for human serum transferrin" *Horm. Met. Res.* **30**, 113-117.
46. Irwin D, Shin D-H, Zhang S, Barr BK, Sakon J, Karplus PA & Wilson DB (1998) "Roles of the catalytic domain and two cellulose binding domains of *Thermomonospora fusca* E4 in cellulose hydrolysis." *J Bact.* **180**, 1709-1714.
47. Becker K, Savvides SN, Keese M, Schirmer RH & Karplus PA (1998) "Enzyme inactivation via sulfhydryl oxidation by physiologic NO-carriers" *Nat Struct Biol* **5**, 267-271.
48. Pearson MA, Schaller RA, Michel LO, Karplus PA & Hausinger RP (1998) "Chemical rescue of *Klebsiella aerogenes* urease variants lacking the carbamylated lysine nickel ligand" *Biochemistry* **37**, 6214-6220.
49. Pearson MA, Karplus PA, Dodge RW, Laity JH & Scheraga HA (1998) "Crystal structures of two mutants that have implications for the folding of bovine pancreatic ribonuclease A." *Protein Sci*, **7**, 1255-1258.
50. Brown BJ, Deng Z, Karplus PA, & Massey V (1998) "On the active site of old yellow enzyme: role of histidine 191 and asparagine 194" *J Biol Chem* **273**, 32753-32762.
51. Aliverti A, Deng Z, Ravasi D, Piubelli L, Karplus PA & Zanetti G (1998) "Probing the function of the invariant glutamyl reside 312 in spinach ferredoxin-NADP+ reductase" *J Biol Chem* **273**, 34008-34016.
52. Finnerty CM, Karplus PA & Granados RR (1999) "The insect immune protein scolexin is a novel serine protease homolog" *Protein Sci* **8**, 242-248.
53. Fox KM & Karplus PA (1999) "The flavin environment in old yellow enzyme: an evaluation of insights from spectroscopic and artificial flavin studies" *J Biol Chem* **273**, 9357-9362.
54. Deng Z, Aliverti A, Zanetti G, Arakaki A, Ottado J, Orellano E, Calcaterra N, Ceccarelli E, Carrillo N & Karplus PA (1999) "A productive NADP+ binding mode of ferredoxin:NADP+ reductase revealed by protein engineering and crystallographic studies." *Nat Struct Biol* **6**, 847-853.
55. Yamaguchi K, Cosper NJ, Stålhandske C, Scott RA, Pearson MA, Karplus PA & Hausinger RP (1999) "Characterization of metal substituted Klebsiella aerogenes urease." *J Bioinog. Chem* **4**, 468-477.
56. Piubelli L, Aliverti A, Arakaki A, Carrillo N, Ceccarelli EA, Karplus PA & Zanetti G (2000) "Competition between C-terminal tyrosine and nicotinamide modulates pyridine nucleotide affinity and specificity in plant ferredoxin-NADP+ reductase" *J Biol Chem* **275**, 10472-10476.
57. Pearson MA, Reczek D, Bretscher AP & Karplus PA (2000) "Structure of the ERM Protein Moesin Reveals the FERM Domain Fold Masked by an Extended Actin Binding Tail Domain" *Cell* **101**, 259-270.

58. Savvides S, Boone T & Karplus PA (2000) "Crystal structure of the Flt3 ligand: common recognition features of helical bundles and cystine knots " *Nat Struct Biol* **7**, 486-491.
59. Pearson MA, Park I-S, Schaller RA, Michel LO, Karplus PA & Hausinger RP (2000) "Kinetic and Structural Characterization of Urease Active Site Variants" *Biochemistry* **39**, 8575-8584.
60. Poole LB, Reynolds CM, Wood ZA, Karplus PA, Ellis HR & Li Calzi M (2000) "AhpF and other NADH:peroxiredoxin oxidoreductases, homologues of low M_r thioredoxin reductase" *Eur J Biochem* **267**, 6126-33.
61. Rodriquez E, Wood ZA, Karplus PA & Lei XG (2000) " Site-directed mutagenesis improves catalytic efficiency and thermostability of *Escherichia coli* pH 2.5 acid phosphatase/ phytase expressed in *Pichia pastoris* " *Arch Biochem Biophys* **382**, 105-112.
62. Wood Z, Poole LB, & Karplus PA (2001) " Structure of Intact AhpF reveals a mirrored thioredoxin-like active site and implies large domain rotations during catalysis" *Biochemistry* **40**, 3900-3911.
63. Rohrmann GF & Karplus PA (2001) "Relatedness of baculovirus and gypsy retrotransposon envelope proteins" *BMC Evolutionary Biology* **1**: 1.
64. Aliverti A, Faber R, Finnerty CM, Ferioli C, Pandini V, Negri A, Karplus PA & Zanetti G. (2001) "Biochemical and crystallographic characterization of ferredoxin:NADP+ reductase from non-photosynthetic tissues" *Biochemistry* **40**, 14501-14508.
65. Finnerty CM, Charrier V, Claiborne A & Karplus PA (2002) "Crystallization and preliminary crystallographic analysis of the soluble α-glycerophosphate oxidase from *Streptococcus* sp." *Acta Cryst.* **D58**, 165-166.
66. Brown, BJ, Hyun, J-W., Duvvuri, S., Karplus PA, & Massey, V. (2002) "The role of glutamine 114 in old yellow enzyme" *J Biol Chem* **277**, 2138-2145.
67. Savvides SN, Scheiwein M, Boehme C, Arteel GE, Karplus PA, Becker K & Schirmer RH (2002) " Crystal structure of the antioxidant enzyme glutathione reductase inactivated by peroxynitrite " *J Biol Chem* **277***,* 2779-2784**.**
68. Wood Z, Poole LB, Hantgan, R.R. & Karplus PA (2002) "Dimers to donuts: redox-sensitive oligomerization of 2-Cys peroxiredoxins" *Biochemistry* **41**, 5493-5504.
69. Wieboldt R, Ramesh D, Jabri E, Karplus PA, Carpenter BK & Hess GP (2002) "Synthesis and characterization of photolabile o-nitrobenzyl derivatives of urea" *J Org. Chem* **67**, 8827-8831.
70. Smith WJ, Nassar N, Bretscher AP, Cerione RA & Karplus PA (2003) "Structure of the active FERM Domain of Ezrin: conformational and mobility changes identify keystone interactions " *J Biol Chem***278**, 4949-4956.
71. Sarma GN, Savvides SN, Becker K, Schirmer M, Schirmer RH & Karplus PA (2003) "Glutathione reductase of the malarial parasite *Plasmodium falciparum*: Crystal structure and inhibitor development" *J Mol Biol* **328**, 893-907.
72. Wood Z, Poole LB & Karplus PA (2003) "Peroxiredoxin evolution and the regulation of peroxide signaling" *Science* **300**, 650-653.
73. Poole LB, Karplus PA & Claiborne A (2004) "Protein sulfenic acids in redox signaling" *Annu. Rev. Pharmacol. Toxicol.* **44**, 325-347.
74. Finnerty CM, Chambers D, Ingraffea J, Faber HR, Karplus PA & Bretscher AP (2004) "The EBP50-Moesin interaction involves a binding site regulated by direct masking on the FERM domain." *J Cell. Sci* **117**, 1547-1552.
75. Myzak MC, Karplus PA, Chung F-L, & Dashwood RH (2004) “A Novel Mechanism of Chemoprotection by Sulforaphane: Inhibition of Histone Deacetylase” *Cancer Res*. **64**, 5767-5774.

76. Sarma GN, Nickel C, Rahlfs S, Fischer M, Becker K, & Karplus PA (2005) "Crystal structure of a novel *Plasmodium falciparum* 1-cys peroxiredoxin" *J Mol Biol* **346**, 1021-1034.
77. Parsonage, D., Youngblood, DS, Sarma, GN, Wood, Z.A., Karplus PA & Poole LB (2005) "Analysis of the link between enzymatic activity and oligomeric state in AhpC, a bacterial peroxiredoxin" *Biochemistry*, **44**, 10583-10592.
78. Roberts BR, Wood ZA, Jönsson TJ, Poole LB & Karplus PA (2005) "Oxidized and synchrotron cleaved structures of the disulfide redox center in the N-terminal domain of *Salmonella typhimurium* AhpF" *Prot Sci* **14**, 2414-20.
79. Sarma GN, Manning V, Ciuffetti L & Karplus PA (2005) "Crystal structure of an RGD-containing host-selective toxin: *Pyrenophora tritici-repentis* Ptr ToxA." *The Plant Cell* **17**, 3190-3202.
80. Krueger SK, Siddens LK, Henderson MC, VanDyke JE, Karplus PA, Pereira CB & Williams DE (2006) "C-terminal truncation of rabbit flavin-containing monooxygenase isoform 2 enhances solubility" *Arch Biochem Biophys.* **450**, 149-156.
81. Sarma, GN & Karplus PA (2006) "In-house, sulfur SAD phasing: A case study of the effects of data quality and resolution cutoffs" *Acta Cryst D*, **62**, 707-716.
82. Simmons, C.R., Liu, Q., Huang, Q., Hao, Q., Begley, T.P., Karplus PA & Stipanuk, M.H. (2006) "Crystal structure of mammalian cysteine dioxygenase: a novel mononuclear iron center for cysteine thiol oxidation" *J Biol Chem* **281**, 18723-18733.
83. Dominy, JEJr, Simmons, C.R., Karplus PA, Gehring, A.M & Stipanuk, M.H. (2006) "Identification and Characterization of Bacterial Cysteine Dioxygenases: A New Route of Cysteine Degradation for Eubacteria" *J Bacteriol.* **188**, 5561-5569. (*PMC1540046*)
84. Mallett, T.C., Wallen, JR, Karplus PA, Sakai, H., Tsukihara, T. & Claiborne, A. (2006) "Structure of coenzyme A disulfide reductase from *Staphylococcus aureus* at 1.54 Å resolution" *Biochemistry* **45**, 11278-11289. (*PMC2525802*)
85. Li Q, Nance, M.R., Kulikauskas, R., Nyberg, K., Fehon, R., Karplus PA, Bretscher, AP & Tesmer, JJG. (2007) Self-masking in intact ERM-merlin proteins: an active role for the enigmatic α-helical domain. *J Mol Biol,* **365**, 1446-1459. (PMC1796844)
86. Benison, G., Karplus PA, & Barbar E (2007) Structure and Dynamics of LC8 Complexes with KXTQT-Motif Peptides: Swallow and Dynein Intermediate Chain Compete for a Common Site. *J Mol Biol* **371**, 457-468. (PMC1796844)
87. Roberts, B.R., Tainer, JA., Getzoff ED., Malencik, D.A., Anderson, S.R., Bomben, V.C., Myers, K.R., Karplus PA & Beckman, JS. (2007) "Structural characterization of zinc-deficient human superoxide dismutase and implications for ALS." *J Mol Biol* **373**, 877-890. (*PMC2175016*)
88. Colussi T, Parsonage D, Boles W, Matsuoka T, Mallet TC, Karplus PA & Claiborne, A. (2008) "Structure of α-glycerophosphate oxidase from *Streptococcus sp.*: A template for the mitochondrial α□glycerophosphate dehydrogenase." *Biochemistry* **47**, 965 -977.
89. Manning, V., Hamilton, S.M., Karplus. PA & Ciuffetti, L.M. (2008) "The Arg-Gly-Asp-containing, solvent-exposed loop of Ptr ToxA is required for internalization" Mol Plant Microbe Int. **21**, 315-325.
90. Karplus PA, Shapavalov MD, Dunbrack RS Jr. & Berkholz DS (2008) "A forward-looking suggestion for resolving the stereochemical restraints debate: ideal geometry functions" *Acta Cryst. D* **64**, 335-336.
91. Parsonage, D., Karplus PA & Poole LB (2008) "Substrate Specificity and Redox Potential of AhpC, a Bacterial Peroxiredoxin." *Proc Nat Acad Sci* 105, 8209-8214. (*PMC2448816*)
92. Meek L, Martin RC, Shan X, Karplus PA, Mok DWS & Mok, MC (2008) "Isolation of legume glycosyltransferases and active site mapping of the *Phaseolus lunatus* zeatin O-glucosyltransferase ZOG1" *J Plant Growth Regul.* **27**, 192-201.

93. Wallen JR, Paige C, Mallett TC, Karplus PA, & Claiborne, A. (2008) "Pyridine Nucleotide complexes with *Bacillus anthracis* coenzyme A disulfide reductase: a structural analysis of dual NAD(P)H specificity." *Biochemistry* **47**, 5182-5193 (*PMC2819376*)
94. Berkholz DS, Faber HR, Savvides SN & Karplus PA (2008) Catalytic cycle of human glutathione reductase near 1 Å resolution *J Mol Biol* **382**, 371-384. (*PMC2593804*)
95. Benison, G., Chiodo, M., Karplus PA, & Barbar E (2008) "Interplay of Ligand Binding and Phosphorylation in the Regulation of Dynein Light Chain LC8" *J Mol Biol* **384**, 954-966. (PMID: 18948118)
96. Simmons CR, Krishnamoorthy K, Granett SL,Schuller DJ, Dominy Jr. JE, Begley TP, Stipanuk MH & Karplus PA (2008) A Putative Fe^{2+}-bound Persulfenate Intermediate in Cysteine Dioxygenase. *Biochemistry*, **47**, 11390-11392. (*PMC2684787*)
97. Nelson KJ Parsonage D, Hall A, Karplus PA, & Poole LB (2008) "Cysteine pKa values for the bacterial peroxiredoxin AhpC" *Biochemistry* 47, 12860–12868. (PMC2645924)
98. Krueger SK, Henderson MC, Siddens LK, VanDyke JE, Benninghoff AD, Karplus PA, Furnes B, Schlenk D & Williams DE (2009) "Characterization of Sulfoxygenation and Structural Implications of Human Flavin-Containing Monooxygenase Isoform 2 (FMO2.1) Variants S195L and N413K" *Drug Metab And Disp* **37**,1785-91 (*PMC2712441*)
99. Hollingsworth S, Berkholz DS & Karplus PA (2009) "On the occurrence of linear groups in proteins." *Protein Sci* **18**, 1321-1325. (*PMC2774442*)
100. Hall A. Parsonage D, Horita D, Karplus PA, Poole LB & Barbar E (2009) "Redox-dependent dynamics of a dual thioredoxin-fold protein: evolution of specialized folds" *Biochemistry* **48**, 5984-5993 (*PMC2744581*)
101. Hall A, Parsonage D, Poole LB & Karplus PA (2009) "Structural changes common to catalysis in the Tpx peroxiredoxin subfamily" *J Mol Biol* **393**, 867-881. *(PMC)*
102. Khayrutdinov BI, Yun YM, Lee JH, Tsuyama T, Hwang E, Ryu KS, Cheong HK, Cheong C, Ko JS, Enomoto T,Karplus PA, Güntert P, Tada S, Jeon YH, Cho Y (2009) Structure of the Cdt1 C-terminal domain: Conservation of the winged helix fold in replication licensing factors. *Prot Sci* **18**, 2252-2264 *(PMC2788280)*
103. Wallen JR, Mallett TC, Boles W, Parsonage D, Furdui CM, Karplus PA & Claiborne A (2009) "Crystal structure and catalytic properties of *Bacillus anthracis* CoADR-RHD: Implications for flavin-linked sulfur trafficking" *Biochemistry* **48**, 9650-9667 *(PMC2758330)*
104. Berkholz DS, Shapavalov MD, Dunbrack RS Jr. & Karplus PA (2009) "Conformation Dependence of Backbone Geometry in Proteins" *Structure* **17**, 1316-1325. *(PMC2810841)*
105. Hall J*,* Karplus PA & Barbar E (2009) "Multivalency in the assembly of intrinsically disordered dynein intermediate chain" *J Biol Chem* **284**, 33115-21. *(PMC2785153)*
106. Benison G, Chiodo M, Karplus PA, & Barbar E (2009) "Structural, Thermodynamic, and Kinetic Effects of a Phosphomimetic Mutation in Dynein Light Chain LC8" *Biochemistry* **48**, 11381-9. *(PMC2821902)*
107. Berkholz DS, Krenesky PB, Davidson JR, & Karplus PA (2010) "Protein Geometry Database: A flexible engine to explore backbone conformations and their relationships with covalent geometry" *Nucleic Acids Res* **38**, D320-5. *(PMC2808862)*
108. Hall J*,* Karplus PA & Barbar E (2010) "The crystal structure of dynein intermediate chain-light chain roadblock complex gives new insights into dynein assembly*" J Biol Chem* **285**, 22566-75. (*PMC2903378*)
109. Tronrud DE, Berkholz DS & Karplus PA (2010) "Using a conformation-dependent stereochemical library improves crystallographic refinement of proteins" *Acta Cryst.* **D66**, 834-842. (*PMC2897700*)
110. Hall A, Parsonage D, Poole LB & Karplus PA (2010) "Structural evidence that peroxiredoxin catalytic power is based on transition state stabilization*" J Mol Biol* **402**, 194-209. (*PMC2941395*)

111. Cooley RB, Arp DJ & Karplus PA (2010) “Evolutionary origin of a secondary structure: π-helices as cryptic but widespread variations of α-helices enhancing protein functionality" *J Mol Biol* **404**, 232-246 (*PMC2981643*)
112. Nirudodhi S, Parsonage D, Karplus PA, Poole LB & Maier CS (2011) “Conformational studies of the robust 2-Cys peroxiredoxin *Salmonella typhimurium* AhpC by solution phase hydrogen/deuterium (H/D) exchange monitored by electrospray ionization mass spectrometry ” *Int. J Mass Spec* **302**, 93-100 *(PMC3079231)*
113. Cooley RB, Rhoads TW, Arp DJ & Karplus PA (2011) “A diiron protein auto-generates a valine-phenylalanine crosslink” *Science* **332**, 929. (*PMC3736988)*
114. Tronrud DE & Karplus PA (2011) A conformation-dependent stereochemical library Improves crystallographic refinement even at atomic resolution. *Acta Cryst* **D67**, 699-706. (*PMC3144852*)
115. Carter EL, Tronrud DE, Taber SR, Karplus PA & Hausinger RP (2011) “Iron-Containing Urease in a Pathogenic Bacterium” *Proc Nat Acad Sci* **108**, 13095-13099 (*PMC3156221*)
116. Cooley RB, Arp DJ & Karplus PA (2011) “Symerythrin structures at atomic resolution and the origins of rubrerythrins and the ferritin-like superfamily” *J Mol Biol* **413**, 177-194. (*PMC3184327*)
117. Berkholz DS, Shapavalov MD, Driggers CM, Dunbrack RS Jr. & Karplus PA (2012) “Nonplanar peptide bonds in proteins are common and conserved but not biased towards active sites” *Proc Nat Acad Sci* **109**, 449-453 (*PMC3258596*)
118. Hollingsworth SA, Lewis MC, Berkholz DS, Wong W-K & Karplus PA (2012) “$(\phi,\psi)_2$-motifs: a purely conformation-based, fine-grained enumeration of protein parts at the two-residue level” *J Mol Biol* **416**, 78-93. (*PMC3268948*)
119. Sher I, Hanemann CO, Karplus PA & Bretscher AP (2012) “The tumor suppressor merlin controls growth in its open state, and phosphorylation converts it to a less-active more-closed state” *Dev. Cell.* **22**, 703-705. *(PMC3725555)*
120. Karplus PA & Diederichs K (2012) "Linking crystallographic model and data quality" *Science* **336**, 1030-1033. (*PMC3457925*)
121. Perkins A, Gretes M, Nelson KJ, Poole LB & Karplus PA (2012) “Mapping the Active Site Helix-to-Strand Conversion of CxxxxC Peroxiredoxin Q Enzymes” *Biochemistry* **51**, 7358-7650. **(***PMC3549014***)**
122. Diederichs K & Karplus PA (2013) “Better models by discarding data?” Acta Cryst D, **69**, 1215-22. **(***PMC3689524***)**
123. Driggers CM, Cooley RB, Sankaran B, Hirschberger LL, Stipanuk MH & Karplus PA (2013) “Cysteine dioxygenase structures from pH 4 to 9: consistent Cys-persulfenate formation at intermediate pH and a Cys-bound enzyme at higher pH” *J Mol Biol* **425**, 3121-3136. **(***PMC3744157***)**
124. Gretes M & Karplus PA (2013) “Observed octameric assembly of a *Plasmodium yoelii* peroxiredoxin can be explained by the replacement of native ‘ball-and-socket’ interacting residues by an affinity tag” *Protein Sci*, **22**, 1445-1452. **(***PMC3795503***)**
125. Perkins A, Nelson KJ, Williams J, Parsonage D, Poole LB & Karplus PA (2013) “The Sensitive Balance Between the Fully Folded and Locally Unfolded Conformations of a Model Peroxiredoxin.” *Biochemistry*, **52**, 8708-8721. **(***PMC3932808***)**
126. Cooley RB, Feldman, J, Driggers, CM, Bundy T, Stokes A, Karplus PA & Mehl, R. (2014) "Structural basis of improved second generation 3-nitro-tyrosine tRNA synthetases" *Biochemistry* **53**, 1916-1924. **(***PMC3985459***)**
127. Driggers CM, Dayal PV, Ellis HR & Karplus PA (2014) “Crystal structure of *Escherichia coli* SsuE: defining a general catalytic cycle for FMN reductases of the flavodoxin-like superfamily” *Biochemistry* **53**, 3509-3519.
128. Kean K, Codding SX, Asamizu S., Mahmud T & Karplus PA (2014) “Structure of a Sedoheptulose 7-Phosphate Cyclase: ValA from *Streptomyces hygroscopicus*”

Biochemistry **53**, 4250-4260 and 4216. (*PMC4095911 and 4095930 correction*)

129. Moriarty N, Tronrud DE, Adams PD & Karplus PA (2014) "Conformation-dependent backbone restraints set a new standard for protein crystallographic refinement" *FEBS J* **281**, 4061-4071. (*PMC4169323*)
130. Cooley RB, Karplus PA & Mehl R (2014) "Gleaning unexpected fruits from hard-won synthetases: Probing principles of permissivity in non-canonical amino acid-tRNA synthetases" *ChemBioChem* **15**, 1810-1819. (*PMC*)
131. Driggers CM, Hartman SJ & Karplus PA (2015) "Structures of Arg- and Gln-type bacterial Cysteine Dioxygenase Homologs" *Protein Sci* **24**, 154-161 (*PMC*)
132. Parsonage D, Nelson KJ, Ferrer-Sueta G, Alley S, Karplus PA & Poole LB (2015) "Dissecting Peroxiredoxin Catalysis: Separating Binding, Peroxidation, and Resolution for a Bacterial AhpC", *Biochemistry* **54**, 1567-1575.
133. Zafred D, Steiner B, Teufelberger AR, Hromic A, Karplus PA, Schofield CJ, Wallner S & Macheroux P (2015) "Rationally engineered flavin-dependent oxidase reveals steric control of dioxygen reduction" *FEBS J* **282**, 3060-3074.
134. Maenpuen S, Watthaisong P, Supon P, Sucharitakul J Parsonage D, Karplus PA, Claiborne A, & Chaiyen P (2015) "Kinetic Mechanism of L-α-Glycerophosphate Oxidase from Mycoplasma pneumonia." *FEBS J*, **282**, 3043-3059.
135. *Elkhal CK, *Kean KM, Parsonage D, Maenpuen S, Chaiyen P, Claiborne A & Karplus PA (2015) "Structure and proposed mechanism of α-glycerophosphate oxidase from *Mycoplasma pneumonia*" *FEBS J*, **282**, 3030-3042.
136. Osborn AR, Almabruk KH, Holzwarth G, Asamizu S, LaDu J, Kean KM, Karplus PA, Tanguay RL, Bakalinsky AT & Mahmud T (2015) "*De novo* synthesis of a sunscreen compound in vertebrates" *eLIFE* May 12;4. doi: 10.7554/eLife.05919 (*PMCxxxxxxx*)
137. Li W, Kinch LN, Karplus PA & Grishin NV (2015) "ChSeq: a database of chameleon sequences" *Protein Sci* **24**, 1075-1086.
138. Clarke SA, Tronrud DE & Karplus PA (2015) "Residue-level global and local ensemble-ensemble comparisons of protein domains" *Protein Sci* **24**, 1528-1542.
139. Brereton, A & Karplus PA (2015) "Native proteins trap high energy transit conformations" *Sci Adv* Oct 16;1(9):e1501188.
140. Moriarty N, Tronrud DE, Adams PD & Karplus PA (2016) "A new default restraint library for the protein backbone in Phenix: a conformation-dependent geometry goes mainstream" *Acta Cryst* **D72**, 176-179.
141. Clark SA, Nyarko A, Löhr F, Karplus PA & Barbar E (2016) "Structural basis of LC8 motif recognition: insights from the LC8-Chica complex" *Biochemistry* **55**, 199-209.
142. Brereton, A & Karplus PA (2016) "On the reliability of peptide non-planarity seen in ultra-high resolution crystal structures" *Protein Sci* **25**, 926-932.
143. Buchko GW, Perkins A, Parsonage D, Poole LB & Karplus PA (2016) "Backbone chemical shift assignments for *Xanthomonas campestris* peroxiredoxin Q in the reduced and oxidized states: a dramatic change in backbone dynamics" *Biomol NMR Assign* **10**, 57-61.
144. Hollingsworth SA, Lewis MC, Karplus PA (2016) "Beyond basins: φ,ψ preferences of a residue depend heavily on the φ,ψ values of its neighbors" *Protein Sci* **25**, 1757-1762.
145. Perkins A, Parsonage D, Nelson KJ, Ogba M, Ha-Yeon Chong P, Poole LB & Karplus PA (2016) "Peroxiredoxin Catalysis at Atomic Resolution" *Structure* **24**, 1668-1678.
146. Driggers CM, Kean KM, Hirschberger LL, Cooley RB, Stipanuk MH & Karplus PA (2016) "Structure-based insights into the role of the Cys-Tyr crosslink and inhibitor-recognition by Mammalian Cysteine Dioxygenase" *J Mol Biol* **428**, 3999-4012.
147. Sharaf NG, Brereton A, Byeon I-JL, Karplus PA & Gronenborn AM (2016) "NMR structure of the HIV-1 reverse transcriptase thumb subdomain" *J Biomol NMR*, **66**, 273-280.
148. Popchock AR, Tseng K-F, Wang P, Karplus PA, Xiang X & Qiu W (2017) "The mitotic

kinesin-14 KlpA contains a context-dependent directionality switch" *Nature Comm* **8**:13999. doi: 10.1038/ncomms13999.

149. Nelson KJ, Perkins A, Van Swearingen AED, Hartman S, Brereton A, Parsonage D, Salsbury FR, Karplus PA & Poole LB (2017) "Experimentally Dissecting the Origins of Peroxiredoxin Catalysis" *Antiox Redox Signal* Apr 4. doi: 10.1089/ars.2016.6922. [Epub ahead of print]
150. Osborn A, Kean KM, Alseud K, Almabruk K, Asamizu S, Lee J, Karplus PA & Mahmud T (2017) "Evolution and Distribution of C7-Cyclitol Synthases in Prokaryotes and Eukaryotes" *ACS Chemical Biology* **12**, 979-988
151. Kean KM, Carpenter RA, Zanetti G, Pandini V, Hall A, Faber R, Aliverti A & Karplus PA (2017) "High resolution studies of hydride transfer in the ferredoxin:$NADP^+$ reductase superfamily" *FEBS J* **284**, 3302-3319. doi: 10.1111/febs.14190.
152. Brereton A & Karplus PA (2018) "Ensemblator v3: Robust Atom-level Comparative Analyses and Classification of Protein Structure Ensembles" *Protein Sci* **27**, 41-50. doi: 10.1002/pro.3249.
153. Kean KM, Porter J, Mehl RA & Karplus PA (2018) "Structural Insights into a Thermostable Variant of Human Carbonic Anhydrase II" *Protein Sci* **27**, 573-577**.** doi: 10.1002/pro.3347.
154. Evangelidis T, Nerli S, Nováček J, Brereton AE, Karplus PA, Dotas RR, Venditti V, Sgourakis NG, Trispsianes K (2018) " Automated NMR resonance assignments and structure determination using a minimal set of 4D spectra" *Nature Comm* **9**, 384. doi: 10.1038/s41467-017-02592-z
155. Portillo-Ledesma S, Randall LM, Parsonage D, Dalla Rizza J, Karplus PA, Poole LB, Denicola A & Ferrer-Sueta G (2018) "Differential Kinetics of Two-Cysteine Peroxiredoxin Disulfide Formation Reveal a Novel Model for Peroxide Sensing" *Biochemistry*, **57**, 3416-3424. doi: 10.1021/acs.biochem.8b00188.
156. Kean KM & Karplus PA (2019) "Structure and role for active site lid of lactate monooxygenase from *Mycobacterium smegmatis*" *Protein Sci* **28**, 135-149. doi: 10.1002/pro.3506
157. Aloi S, Davies CG, Karplus PA, Wilbanks SM, Jameson GNL (2019) "Substrate Specificity in Thiol Dioxygenases" *Biochemistry* **58**, 2398-2407. doi: 10.1021/acs.biochem. 9b00079.
158. Bednar RM, Golbek TW, Kean KM, Brown WJ, Jana S, Baio JE, Karplus PA, Mehl RA (2019) Immobilization of Proteins with Controlled Load and Orientation. *ACS Appl Mater Interfaces* 11:36391-36398. doi: 10.1021/acsami.9b12746.
159. Beyer J, Hosseinzadeh P, Gottfried-Lee I, Van Fossen E, Zhu P, Karplus PA, Mehl RA, Cooley RB (2020) "Overcoming near-cognate suppression in a Release Factor 1-deficient host with an improved nitro-tyrosine tRNA synthetase" *J Mol Biol* **432**, 4690-4704. doi: 10.1016/j.jmb.2020.06.014.
160. Tronrud DE & Karplus PA (2020) "A Complete Fourier Synthesis-based Backbone Conformation-Dependent Library for Proteins" *Acta Cryst D*, submitted 23.June.20

Invited Reviews

1. Schulz GE & Karplus PA (1988) "High resolution structure and catalytic action of human glutathione reductase" *Biochem Soc. Trans.* **16**, 81-84. (PMID: 3371538)
2. Karplus PA & Schulz GE (1992) "The refined three-dimensional structure of glutathione reductase" In *Chemistry and Biochemistry of Flavoenzymes* Vol. 3 (F. Muller, ed.) CRC Press, Boca Raton Florida, pp. 213-228.
3. Kaushansky K & Karplus PA (1993) "Hematopoietic Growth Factors: Understanding Functional Diversity in Structural Terms" *Blood*, **82**, 3229-3240. (PMID: 8241495)

4. Karplus PA & Bruns CM (1994) "Structure Function Relations for Ferredoxin Reductase" *J Bioenerg. Biomemb.* **26**, 89-99. (PMID: 8027025)
5. Karplus PA & Faerman C (1994) "Ordered water in macromolecular structure" *Curr Opin Struct Biol* **4**, 770-776.
6. Karplus PA, Fox KM & Massey V (1995) "Structure-function relations for old yellow enzyme" FASEB J **9**, 1518-1526. (PMID: 8529830)
7. Aliverti A, Pandini VE, Sternieri FA, Corrado ME, Karplus PA & Zanetti G (1995) "Spinach ferredoxin-NADP+ reductase: structure-function relationship as studied by site-directed mutagenesis" in *Photosynthesis: from light to biosphere* vol II (ed., P Mathis) pp. 653-656.
8. Karplus PA, Pearson MA & Hausinger RP (1997) "70 years of crystalline urease: what have we learned?" *Acc Chem Res* **30**, 330-337.
9. Himmel ME, Karplus PA, Sakon J, Adney WS, Baker JO & Thomas SR (1997) "Polysaccharide hydrolase folds: diversity of structure and convergence of function" *Appl Biochem Biotechnol* **63**, 315-325. (PMID: 18576090)
10. Taha SMT, Brayman TG, Karplus PA & Hausinger RP (1997) " Urease nickel metallocenter: structure and assembly" in *Transition Metals in Microbial Metabolism* (G Winkelmann, CJ Carrano eds.) Harwood Academic Publishers, Amsterdam 391-413.
11. Hausinger RP & Karplus PA (2001) "Urease" in *Handbook of Metalloproteins* (Messerschmidt A, Huber R, Poulos TL, Wieghard K, eds.) John Wiley & Sons, Chichester; pp. 867-879.
12. Karplus PA & Faber, H.R. (2004) "Structural aspects of plant ferredoxin:NADP+ oxidoreductases" *Photosynth Res* **81**, 303-315.
13. Karplus PA & Hall A (2007) "Structural Survey of the Peroxiredoxins" *Subcell. Biochem* **44**, 41-60. [or in *Peroxiredoxin Systems: Structures and Functions* (L. Flohe & J R. Harris, eds.) Springer, pp. 41-60.
14. Hall A, Karplus PA, & Poole LB (2009) "Typical 2-Cys peroxiredoxins: Structures, mechanisms and functions." *FEBS Jl* **276**, 2469-2477 (*PMC2747500*)
15. Parsonage, D., Reeves, S.A., Karplus PA & Poole LB (2010) "Engineering of fluorescent reporters into redox domains to monitor electron transfers" *Meth Enzymol*, **474**, 1-21.
16. Hollingsworth SA & Karplus PA (2010) "A fresh look at the Ramachandran plot and the occurrence of standard structures in proteins" *Biomol Concepts*, **1**, 271-283 (*PMC3061398*)
17. Stipanuk MH, Dominy JE Jr, Simmons CR & Karplus PA (2011) "Thiol Dioxygenases: Unique Families of Cupin Proteins" *Amino Acids* **41**, 91-102.
18. Klomsiri C, Karplus PA & Poole LB (2011) "Cysteine-based redox switches in enzymes" *Antiox Redox Signal*, **14**, 1065-71. (*PMC3064533*)
19. Hall AR, Nelson KJ, Poole LB & Karplus PA (2011) "Structure-based insights into the catalytic power and conformational dexterity of peroxiredoxins." *Antiox Redox Signal* **15**, 795-815. (*PMC3125576*)
20. Gretes M, Poole LB & Karplus PA (2012) "Peroxiredoxins in parasites" *Antiox Redox Signal* **17**, 608-633. (*PMC3373223*).
21. Poole LB, Nelson KJ & Karplus PA (2013) "Sulfenic Acids and Peroxiredoxins in Oxidant Defense and Signaling" in Oxidative Stress and Redox Regulations (U. Jacob, D. Reichmann, Eds.) Springer, NY, pp. 85-118.
22. Nelson KJ, Parsonage DP, Karplus PA & Poole LB (2013) "Evaluating peroxiredoxin sensitivity towards inactivation by peroxide substrates" *Meth. Enzymol* **527**, 21-40.
23. Perkins A, Poole LB & Karplus PA (2014) "The tuning of peroxiredoxin catalysis for various physiological roles" *Biochemistry* **53**, 7693-7705.
24. Karplus PA (2015) "A primer on peroxiredoxin biochemistry" *Free Radic. Biol Med.* **80**, 183-190. (Pubmed in progress NIHMS 636685)

25. Perkins A, Nelson KJ, Parsonage D, Poole LB & Karplus PA (2015) “Peroxiredoxins: Guardians Against Oxidative Stress and Modulators of Peroxide Signaling” *Trends Biochem Sci* **40**, 435-445.
26. Driggers CM, Stipanuk MH & Karplus PA (2015) “Mammalian Cysteine Dioxygenase” *Encyclopedia of Inorganic Biochemistry;* http://onlinelibrary.wiley.com/doi/10.1002/9781119951438.eibc2326
27. Karplus PA & Diederichs K (2015) “Assessing and Maximizing Data Quality in Macromolecular Crystallography” *Curr Op Struct Biol* **34**, 60-68. (*PMC4684713*)
28. Poole LB & Karplus PA (2017) “Catalysis by peroxiredoxins at high temporal and structural resolution” in: *Hydrogen Peroxide Metabolism in Health and Disease* (Eds: MCM Vissers, MB Hampton, TJ Kettle) Publisher: CRC Press, Taylor and Francis Group (Florida), pp 127-147. doi: 10.1201/9781315154831-8
29. *Osborn AR, *Kean KM, Karplus PA & Mahmud T. (2017) **“**The Sedoheptulose 7-phosphate Cyclases and Their Emerging Roles in Biology and Ecology” *Nat Prod Reports* **34**, 945-956.

Meeting proceedings, commissioned highlights, and assorted other publications

1. Karplus PA & Herriott JR (1982) The structure of ferredoxin:NADP oxidoreductase. A progress report. In *Flavins and Flavoproteins* (V. Massey and CH Williams, eds.) Elsevier North Holland, New York, pp 28-31.
2. Karplus PA, Herriott JR and Walsh KA (1984) The amino acid sequence and partial tertiary structure of ferredoxin:NADP oxidoreductase from spinach. In *Flavins and Flavoproteins* (RC Bray, PC Engel & SG Mayhew, eds.) Walter de Gruyter, Berlin p. 173.
3. Karplus PA & Schulz GE (1987) The active center of glutathione reductase at 1.54 Å resolution. In *Flavins and Flavoproteins* (Edmondson DE and McCormick, D.B., eds), pp 45-54, Walter de Gruyter and Co., Berlin.
4. Bruns CM & Karplus PA (1991) Evaluation of Secondary Structure Predictions for Enzymes Related to Ferredoxin Reductase. In *Flavins and Flavoproteins* (B. Curti, S. Ronchi, G. Zanetti, eds.) Walter de Gruyter, Berlin, pp. 487-491.
5. Fox KM, Jacques SM & Karplus PA (1991) Crystallization and Characterization of Old Yellow Enzyme, In *Flavins and Flavoproteins* (B Curti, S Ronchi, G Zanetti, eds.) Walter de Gruyter, Berlin, pp. 353-356.
6. Karplus PA (1991) Structure/Function of Spinach Ferredoxin:$NADP^+$ Oxidoreductase. In *Flavins and Flavoproteins*. (B. Curti, S. Ronchi, G. Zanetti, eds.) Walter de Gruyter, Berlin, pp. 449-456.
7. Karplus PA (1992) "Drugs of the Future" Cornell Focus **1**, 20-23.
8. Bruns CM & Karplus PA (1994) "Refined Crystal Structures of Native, Complexed and Reduced Forms of Spinach Ferredoxin Reductase" in *Flavins and Flavoproteins* (Yagi, K., ed) Walter de Gruyter, Berlin, pp. 443-446.
9. Fox KM & Karplus PA (1994) "Stirring New Interest in an Old Enzyme: Crystal Structure of Old Yellow Enzyme" in *Flavins and Flavoproteins* (Yagi K, ed) Walter de Gruyter, Berlin, pp. 381-390.
10. Bruns CM & Karplus PA (1995) "The multi-drop approach: more efficient screening of crystallization conditions" *J Appl Cryst* **28**, 242-243.
11. Zanetti G, Aliverti A, Ravasi D, Curti B, Deng Z & Karplus PA (1996) "On the role of Glu-312 of spinach ferredoxin-NADP+ reductase" in *Flavins and Flavoproteins 1996* (ed.Stevenson) University of Calgary Press, pp. 509-512.
12. Wilson DB, Irwin D, Sakon J & Karplus PA (1998) "*Thermomonospora fusca* cellulase E4: a processive endocellulase" meeting proceedings

13. Hausinger RP & Karplus PA (1999) "Use of urea-based fertilizers to stimulate plant growth" USDA NRI Research Highlights issue (D. McAllister, ed.)
14. Karplus PA (1999) "Structural flavinology on the brink" in *Flavins and Flavoproteins* (S Ghisla, P Kroneck, P Macheroux, H Sund, eds.) Rudolf Weber, Berlin, pp. 233-238.
15. Aliverti A, Ferioli C, Spinola M, Raimondi D, Zanetti G, Finnerty C, Faber R & Karplus PA (1999) "Structural and functional properties of corn root ferredoxin:$NADP^+$ reductase " in *Flavins and Flavoproteins* (S Ghisla, P Kroneck, P Macheroux, H Sund, eds.) Rudolf Weber, Berlin, pp. 265-268.
16. Piubelli L, Aliverti A, Zanetti G, Arakaki A, Carrillo N, Ceccarelli E & Karplus PA (1999) "Role of C-terminal Tyrosine of plant ferredoxin:$NADP^+$ reductase in $NADP^+$ binding affinity and pyridine nucleotide specificity" in *Flavins and Flavoproteins* (S Ghisla, P Kroneck, P Macheroux, H Sund, eds.) Rudolf Weber, Berlin, pp. 269-272.
17. Poole LB, Roberts BR, Wood ZA, Jönsson TJ, Reynolds CM & Karplus PA (2005) "The AhpC-reducing, thioredoxin-like N-terminal domain of AhpF" in *Flavins and Flavoproteins* (T Nishino, R Miura, M Tanokura, K Fukui eds.) pp. 353-357, ArchiTect Inc. Tokyo, Japan.
18. Karplus PA (2006) "Learn About the Buffer" *BAMBED* **34**, 285.
19. Karplus PA (2006) "Enzymes Speed Reactions" *BAMBED* **34**, 286.
20. Karplus PA (2006) "Chymotrypsin" *BAMBED* **34**, 287.
21. Driggers C, Ellis HR & Karplus PA (2011) Crystal Structure of *Escherichia coli* NADPH FMN reductase SsuE with and without bound FMN, in *Flavins and Flavoproteins* (S. Miller, C. Thorpe, eds.)
22. Poole LB & Karplus PA (2012) "Peroxiredoxins as molecular triage agents, sacrificing themselves to enhance cell survival during a peroxide attack" *Molec. Cell* **45**, 275-278
23. Diederichs K & Karplus PA (2013) "Data processing: how good are my data really?" in "Advancing Methods for Biomolecular Crystallography" (R Read, A Urzhumstev, V Lunin, Eds) Springer, Dordrecht, NL, pp. 59-68.

Patents

Faerman C, Karplus PA & Vargas L (1998) "Use of human transferrin in controlling insulin resistance" Patent number 5849293

Teaching

Protein Structure and Function (BioBM 631) - Full responsibility for curriculum development and teaching of 3 unit (ca. 40 lectures) graduate level course. Average enrollment is 60 students including 4 undergraduates plus 15 auditors from 13 different departments. To encourage the assimilation of principles rather than facts alone, the exams for this course are open-book take-home questions which present realistic (or real!) problems that might be encountered in research. 1989 - 1994.

Methods and Logic in Biochemistry (BioBM 834) - With Tim Huffaker developed and organized discussion course for first year Biochemistry graduate students (10-15 students). The course is to critically discuss original research papers to teach subtleties of planning experiments and critically evaluating data. 1990 - 1993; One session F96.

Advanced Biochemical Methods (BioBM 831) - Developed a laboratory protocol for protein crystallography. 1991.

Protein Crystallization Mini Course (BioBM 732) - Developed and presented 6 hours of lecture on methods of protein crystallization and the fidelity of crystallographic protein structure analysis. 1991.

Freshmen enrichment program (BioBM 101-104) - Designed and led an exploratory 2-hour introduction to protein crystallography and modelling. This was part of a campus wide effort to allow Freshmen an inside view into various fields to aid them in their career choices. 1991 - 93

Macromolecular Crystallography (BioBM 738) - New course developed and team taught, together with Steve Ealick and Jon Clardy. 3 unit lecture course covering the fundamentals of crystallography and methods for determining 3-dimensional structures of macromolecules. Spring 93, 95, 97.
Guest Lectures Given in the Following Courses: General Biochemistry (Bio Sci 330) 88-89 Orientation Lectures in Biochemistry (BioSci 132) 89 - 90; Enzymes, Coenzymes and Metabolic Regulation (BioSci 635) 1990.
Autotutorial Introductory Biochemistry (BioBM 330) - Sp97.
BB 350 at Oregon State University - General Biochemistry for non-majors. Taught the first half of the course (4 lectures/week for 5 weeks). F95, F98, F99, Sp19, Sp20
BB100 - "Molecules of Life" very basic biochemical concepts for Freshman (W99, W03, W04).
BB507/607 – Fall term (2 years)
BB483/583 - Third term Biophysics. Practical structure determination, molecular mechanics, molecular dynamics, protein stability and folding, ligand affinity, catalytic power, drug design. Sp99 - Sp07,Sp12, Sp20
BB481/581 - First term Biophysics. Overview of molecular biophysics: molecular mechanics, molecular dynamics, protein stability and folding, ligand affinity, catalytic power, drug design. F07 – F14.
BB490/590 – First term Biochemistry for majors. F19,20
BB494 – Biochem GCE lab course. W20
MCB669 – guest lecture on "Protein structure prediction" (W four years)
BB651 - Advanced course on protein evolution. Lectures on principles and discussion of recent literature. W00, F03, F06, S09, S13
BB450 – General Biochemistry. W05-W07, F12
BB111 – F08,9,10,11,19,20 lecture on "What is Biophysics"
MCB511 – F05,09,10 one lecture on my research
HC408 - Honors intro to thesis – faculty panel Sp10
BB699 – grant proposal writing – developed and taught F18
HC408 - Honors intro to thesis: Stage II – F19, W20, Sp20, F20

PhD Students (*co-major advisor; date of entry into lab rather than the program is given)

Kristin Fox	1989-12/93	structural studies of old yellow enzyme
Mike Spezio*	1989-12/93	structural studies of a thermophilic cellulase
Chris Bruns	1990-03/95	ferredoxin reductase/protein structure comparisons
Evelyn Jabri	1990-05/95	structure of urease
Corey Strickland	1992-09/95	drug design for trypanothione reductase
Linda Brinen*	1991-06/93	chorismate mutase
Yunje Cho*	1991-08/93	xylose isomerase mutants
Rich Whitaker*	1993-12/94	xylose isomerase mutants
Zhan Deng	1994-04/98	ferredoxin reductase:NADP complex; old yellow enzyme
Matt Pearson	1995-08/99	urease mutants; moesin N/C-complex
Savvas Savvides	1995-04/00	Flt3-ligand and modified glutathione reductases
Zac Wood	1997-10/01	AhpC and AhpF
Sesha Duvvuri	1999-2002	old yellow enzyme mutants and NADPH complex
Ganapathy Sarma	2001-10/05	*P. falciparum* GR & AOP, *P. tritici-repentis* ToxA
Blaine Roberts*	2003-05/07	AhpF-NTD, Zn-free SOD
Donnie Berkholz	2005-08/09	empirical analyses of high-resolution protein structures
Best Talk at WCPCW March 2009		
Andrea Hall	2006-05/10	peroxiredoxin dynamics and catalytic mechanism
Bayley Award 2009-10		
Justin Hall	2006-2007	*Ptr*ToxA (transferred to Elisar Barbar to work on dynein)
Rick Cooley*	2007-09/11	butane monooxygenase; pi-helices; symerythrin

Yerex Award 2010-11; Best Talk at WCPCW March 2011; OSU CGS/ProQuest Distinguished Dissertation 2013; (NIH postdoc fellowship)

Camden Driggers	2009-08/14	cysteine dioxygenase and SsuE
Sara Codding	2011-2012	merlin structure-function; sugar phosphate cyclases
Arden Perkins	2012-2015	peroxiredoxins

OSU "3-minute Thesis" 3rd Place 2012; OSU CGS/ProQuest Distinguished Dissertation 2015; Best talk at WCPCW March 2017; (NIH postdoc fellowship)

Kelsey Kean	2013-2018	sugar phosphate cyclases, FNR, LMO, Prx2, GCE

Yerex Award 2016-17; Best Poster Award Genetic Code Expansion Conference 2016;

Andrew Brereton	2014-2017	protein geometry and protein comparison studies

Top Lightning Talk CGRB spring conf 2015; Best Poster *Proteins* GRC 2015; Bayley Award 2016-17; 1st place 2016 OSU 3-Minute Thesis

Post Doctoral Fellows

Kay Diederichs	1990-1991	Crystallographic studies of the cytokine GM-CSF
Denise Rozwarski	1992-1995	Crystallographic studies on the cytokine GM-CSF
Joshua Sakon	1993-1997	Crystallographic studies of cellulases
Casey Finnerty	1996-1998	Expression, characterization of scolexin; Moesin:EBP50
Rick Faber	1999-2007	High-resolution flavoenzyme structures
Dale Tronrud	2009-current	Protein geometry studies
Russell Carpenter	2009-2011	Merlin biochemistry and structure
Mike Gretes	2011-2013	Peroxiredoxins in parasites ; NIH fellowship

Undergraduate (*did honors thesis)
Mark Daniels, Greg Whitman (Class of 1990)
Masahisa Handa, Kyu Rhee, Daniel Gschwend* (Class of 1991)
Leslie Bayer (Class of 1992)
Louis Hom*, Robert Puchalski (Class of 1993)
Alan Grossfield (Class of 1994)
Savvas Savvides* (Class of 1995)
Mike Wisc (Class of 1996)
Peter Woolf (Class of 1997)
Mark Breidenbach*, Julie Gray (Class of 1998)
Anna Diller (vor-diplom U. Konstanz, Germany) 1999-2000
Stuart Streeter (Class of 2002)
Derek Youngblood (Class of 2005)
Peter Gross, Elizabeth Camp
David Stanley (Class of 2006)
Will Martin (Class of 2007)
Kara Miles-Rockenfeld (Class of 2009) – Honors thesis
Scott Hollingsworth (Class of 2010) – HHMI 2008, 09
Best talk HHMI 2009
Matt Lewis (Class of 2011)
Ian Winter (Class of 2012)
Callia Palioca (Class of 2013) – HHMI 2010; Honors thesis
Best Poster prize Honors College May 2013
Andrea Higdon (Class of 2014; Cornell U.) – summers 2011,12
NSF Fellowship in grad school
Justin Biel (Class of 2013) – HHMI 2012
Best Talk HHMI 2012; Best Talk WCPCW 2013; Best Poster CUE 2013; 2013 OSU Undergrad Researcher of the Year; NSF Fellowship in grad school
Steven Hartman (Class of 2014)
Mahon Khoshzaban (Class of 2015) - Honors thesis
Taylor Roemelt (Class of 2016) – Honors thesis
Zach Goode (Class of 2017)

Jenna Beyer (Class of 2020) OHSU Qual Biosci Biomed Eng internship summer 2017 NSF GFRP 2019; PhD program at U Penn

Invited Meeting Presentations (41)

"9th International Symposium on Flavins and Flavoproteins", Atlanta, GA, June 7-13, 1987. "The refined structure of Glutathione Reductase at 1.54 Å".

"10th International Symposium on Flavins and Flavoproteins", Como, Italy, July 15-20, 1990. "The Structure of Ferredoxin:NADP Oxidoreductase".

Gordon Conference on "Physicochemical Aspects of Photosynthesis", Andover, NH, July 29-August 2, 1991. "X-ray Structure of Ferredoxin:NADP Reductase at High Resolution".

PENCE Workshop "GMCSF" Vancouver, BC , January 31, 1993

"11th International Symposium on Flavins and Flavoproteins", Nagoya, Japan, July 15-20, 1993. "Stirring New Interest in an Old Enzyme: The Structure of Old Yellow Enzyme".

NIH Wound Healing and Tissue Repair Workshop " GMCSF" November 1-2, 1993

FASEB Meeting: American Association of Immunologists" Stuctural comparisons among helical cytokines" Anaheim, CA. April 24-29, 1994

CHESS symposium "High Resolution Studies using CCD Detector Data for trypanothione reductase and a cellulase" May 2-3, 1994

Metals in Biology Gordon Conference "The crystal structure of urease" Jan 22-26, 1995

ACS Annual Meeting "The crystal structure of urease" Anaheim, CA April 2-6, 1995

Proteins Gordon Conference "Reliability, reproducibility and relevance of crystallographically observed protein hydration" June 18-23, 1995

VAAM annual meeting "The structure and mechanism of urease" Bayreuth, Germany, Mar 24-27, 1996

ACS Meeting "70 Years of crystalline urease: what have we learned" Pfizer award address; Orlando, FL Aug 26-28, 1996

1997 Proteins Gordon Conference, June 15-21, Holderness, NH; Co-chair

55th Annual Pittsburg Diffraction Conference "Urease and the origins of catalytic power" Athens, GA Nov 6-8, 1997

"Biochemistry at 100° C: How are enzymes and their substrates stabilized? " Banbury Center, Cold Spring Harbor Laboratory, Dec 6-9, 1998. Session Chair

"13th International Symposium on Flavins and Flavoproteins", Konstanz, Germany, Aug 30-Sept 3, 1999. "Structural Flavoenzymology on the Brink"

"Structural Biology: 50 years after the α-helix" Milton Harris minisymposium, May 18, 2001 Oregon State University, OR "Getting High on Protein Structure"

2001 "Cellulases and Cellulosomes" Gordon Conference, Jul 29-Aug 3, Proctor Academy, NH; Session discussion Leader "Structural Aspects of Cellulases and Cellulosomes"

"14th International Symposium on Flavins and Flavoproteins", Cambridge, England, Jul 14 - 18, 2002. Session Chair

2003 "Cellulases and Cellulosomes" Gordon Conference, Jul 27-Aug 1, Proctor Academy, NH; Session discussion Leader "Keynote Speakers"

2004 Society for Free Radical Biology and Medicine Annual Meeting, "Peroxiredoxin structure and floodgate control of peroxide signaling in eukaryotes" St. Thomas, Nov 17-21, 2004

"15th International Symposium on Flavins and Flavoproteins", Japan, Apr 2005. Chair of Kunio Yagi & Vincent Massey in Memoriam session

2007 West Coast Protein Crystallography Workshop 18, March 11-14, Asilomar, CA; Co-organizer with Dick Brennan

"16th International Symposium on Flavins and Flavoproteins", Jaca, Spain, June 2008. Session Chair

"American Crystallographic Assoc. Annual Meeting", Toronto, Canada, July 2009. “Glutathione reductase: probing catalysis at atomic resolution”

“CGRB Fall Conference” Corvallis, OR, Sept 2010. “A beneficial bulge: π-helices and the evolution of proteins”

"17th International Symposium on Flavins and Flavoproteins", Berkeley, CA, July 2011. Session Chair

“Thiol-Based Redox Regulation and Signaling" Gordon Conference, Jul 29-Aug 3, 2012 Bates College, Maine; "All in the family: nature's dominant peroxidases show many variations on a common catalytic engine"

2013 West Coast Protein Crystallography Workshop, Mar 17-20, Monterey, CA. “Better refined models derive from including high-resolution data beyond conventional limits” Best talk award

“Queenstown Molecular Biology Redox Meeting”, Aug. 25-6, 2013, Queenstown, NZ - Plenary lecture “Finding the right balance: how exquisite interrelationships of conformation and chemistry govern peroxiredoxin catalysis”

"Redox Biology of Thiols in Signaling Pathways" Workshop at the 2013 Society for Free Radical Biology and Medicine Annual Meeting, Nov. 20, 2013; San Antonio, Texas

“UTMB Structural Biology Symposium” May 17, 2014, Galveston, TX. “Getting better protein models from a given diffraction data set: moving beyond conventional practices”

2014 Northwest Crystallography Workshop, June 20-22, Corvallis, OR. Conference Organizer

18th International Symposium on Flavins and Flavoproteins, Thailand, July 2014. Session Chair

Redox Chemistry and Thiol Biology Workshop “Using structural information to gain insights into mechanisms of enzyme catalysis” March 4-6, 2015 Montevideo, Uruguay

Redox Chemistry and Thiol Biology Symposium “Cysteine dioxygenase: High resolution structures … but still seeking resolution of the mechanism” March 7-8, 2015 Punta del Este, Uruguay

“Oxygen Club of California 2016 World Congress on Redox Medicine and Nutrition”, U.C. Davis, May 4-6, 2016. “Finding the right balance: how exquisite interrelationships of conformation and chemistry govern peroxiredoxin catalysis”

“NOX Family NADPH Oxidases" Gordon Conference, Jun 5-10, 2016 Waterville Valley Resort, New Hampshire; " Ferredoxin NADP+ Reductase as a Model System for Flavoprotein-Mediated Electron Transfer”

West Coast Protein Crystallography Workshop, Mar 19-22, 2017; Asilomar, CA; Session Chair.

Montana Academy of Sciences, Annual Meeting, Apr 7, 2017; Butte, MT. Keynote Speaker.

Seminars (79)

CNRS, Strasbourg, France, "Relationship of Protein Flexibility and Antigenicity: Implications and Applications". October 31, 1986.

Cornell University, "The Refined Structure of Glutathione Reductase at 1.54 Å Resolution". April 14, 1987.

Scripps Institute, "The Refined Structure of Glutathione Reductase at 1.54 Å Resolution". April 21, 1987.

Upjohn Institute, "The Refined Structure of Glutathione Reductase at 1.54 Å Resolution". May 18, 1987.

University of Michigan, "The Refined Structure of Glutathione Reductase at 1.54 Å Resolution". May 19, 1987.

University of Heidelberg, W. Germany, "Glutathione Reductase at 1.5 Å Resolution: Insights into Structure and Function". May 21, 1987.

University of Regensburg, W. Germany, "Glutathione Reductase at High Resolution: Insights into Structure and Catalysis". February 23, 1988.

SUNY Syracuse, "X-ray Crystallographic Structure Determination of Ferredoxin Reductase From Spinach". January 28, 1991.
University of Wisconsin, Madison, "High Resolution Crystallographic Analysis of Spinach Ferredoxin:NADP Reductase: Insights into Structure and Catalysis". March 11, 1991.
AMGEN, Thousand Oaks, CA, "Crystal Structure of GM-CSF and a Putative Receptor Recognition Site". October 15, 1991.
Rockefeller University, NY, "Structure, Function and Evolution of Ferredoxin:NADP Reductase". December 3, 1991.
University of Toronto, Canada, "Structure/Function Studies of a Colony-Stimulating Factor and the FK-506 Binding Protein". January 7, 1992.
Cornell University, "Granulocyte-Macrophage Colony Stimulating Factor: Fold, Family and Function". January 29, 1992.
DNAX PAlo Alto, CA, "Granulocyte-Macrophage Colony Stimulating Factor: Fold, Family and Function". April 23, 1992.
Scripps Research Inst., CA, "Granulocyte-Macrophage Colony Stimulating Factor: Fold, Family and Function". May 26, 1992.
Michigan State University "Refined Structure of Spinach Ferredoxin Reductase: Determinants of Ligand Specificity and Catalysis" January 18, 1993
Dupont-Merck "GM-CSF" December 2-3, 1993
Ithaca College "Structure-based Drug Design: Targeting parasitic diseases" January 27, 1994
Rutgers University "Toward Structure-based Drug Design: Targeting parasitic diseases" May 11, 1994
Albert Einstein Medical College "Toward Structure-based Drug Design: Targeting parasitic diseases" Oct. 25, 1994
Cornell University "The structure of urease: the first crystalline enzyme unmasked" Jan 1995.
Oregon State University "The structure of urease: the first crystalline enzyme unmasked" May 19, 1995.
Oregon Graduate Institute "The structure and mechanism of urease" Feb 2, 1996
University of Freiburg, "Conformational energetics and conformation dependent peptide geometries: Ramachandran revisited" Mar. 26, 1996
University of Freiburg, "The structure of a cellulase:substrate complex gives insight into mechanism and evolution of glycosyl hydrolases" Mar. 27, 1996
University of Heidelberg "Conformational energetics and conformation dependent peptide geometries: Ramachandran revisited" Mar. 29, 1996
NIH "Conformational energetics and conformation dependent peptide geometries: Ramachandran revisited" Apr. 25, 1996
University of Washington, The structure of a cellulase:substrate complex gives insight into mechanism and evolution of glycosyl hydrolases" May 23, 1996
University of Arkansas "Conformational energetics and conformation dependent peptide geometries: Ramachandran revisited" July 16, 1996
Cornell University "Conformational energetics and conformation dependent peptide geometries: Ramachandran revisited" Sept. 18, 1996
Pfizer "The structure and mechanism of urease" Jan 1997
U. Toronto "The structure and mechanism of urease" Jan 29, 1997
U. Montana, Bozeman "Urease and the origins of catalytic power" Oct 6, 1997.
Oregon State University "Urease and the origins of catalytic power" Feb, 1998
Purdue University "On the mechanism of urease and the origins of catalytic power" Sept 14, 1998
Oregon State University Physics Dept. " Conformational energetics and conformation dependent peptide geometries: Ramachandran revisited" May 1, 2000
Copenhagen University "On the mechanism of urease and the origins of catalytic power" Feb 21, 2001
Novozymes " Ramachandran revisited: Conformational energetics and conformation dependent peptide geometries" Feb 21, 2001

Cal Poly, SLO " Kisses and Doughnuts: structural studies on alkyl hydroperoxide reductase" Apr 19, 2002

Oregon State University Chemistry Dept. "Structural studies of a prokaryotic enzyme lead to a floodgate model for the regulation of peroxide signaling in eukaryotes" Feb 3, 2003

Medical College of Wisconsin, Biochemistry Dept. "Peroxiredoxin structure and floodgate control of peroxide signaling in eukaryotes" Jan 28, 2004

U.C. Berkeley, Chemistry Dept. "Peroxiredoxin structure and floodgate control of peroxide signaling in eukaryotes" Mar. 1, 2004

Wake Forest University, Biochemistry Dept. "Peroxiredoxin structure and floodgate control of peroxide signaling in eukaryotes" May 24, 2004

Cal Poly, SLO "Peroxiredoxin structure and floodgate control of peroxide signaling in eukaryotes" 2004 (date uncertain)

Michigan State University, Biochemistry Dept. "Peroxiredoxin structure and floodgate control of peroxide signaling in eukaryotes" Oct 24, 2005

U. Michigan, Ann Arbor, Biochemistry Dept. "Peroxiredoxin evolution and the control of eukaryotic peroxide signaling" Oct 25, 2005

Cal Poly, SLO, Chemistry Dept. "Learning the methods of a deadly assassin: structure-function studies of a fungal protein toxic to wheat" Nov 10, 2005

Oregon State University, Sigma Xi Award Lecture "Protein Structure, Hydrogen Peroxide Signaling and Cancer: Understanding the role of one enzyme family" Jan 27, 2006

Oregon State University, Christian Graduate Fellowship "What is Intelligent Design: A critic's perspective" Apr 20, 2006

Wake Forest University, Physics Dept. "Ramachandran revisited: Conformational energetics and conformation dependent peptide geometries" Sept 14, 2006

Duke University, Biochemistry Dept. "Peroxiredoxin evolution and the control of eukaryotic peroxide signaling" Sept 15, 2006

Cal Poly, SLO, Chemistry Dept. "Getting membranes all ruffled up: conformational regulation of ERM-merlin proteins" Nov 16, 2006

University of Washington, Biochemistry Dept. "Peroxiredoxin evolution and the control of eukaryotic peroxide signaling" Dec 7, 2006

University of Vermont, Biochemistry Dept. "Peroxiredoxin evolution and the control of eukaryotic peroxide signaling" Mar 23, 2007

Cornell University, MacCHESS. "Getting membranes all ruffled up: conformational regulation of ERM-merlin proteins" Mar 27, 2007

Cal Poly, SLO, Chemistry Dept. "Beyond Linus Pauling: the conformation dependence of ideal peptide geometry and why it matters" Jan 2008

University of Ghent, Belgium "Peroxiredoxin evolution and the control of eukaryotic peroxide signaling" Aug 28?, 2008

Oregon State University, Physics Dept. "Beyond Linus Pauling: the conformation dependence of ideal peptide geometry and why it matters" March, 2 2009

University of Minnesota, Biochemistry Dept. " Beyond Linus Pauling: the conformation dependence of ideal peptide geometry and why it matters" Mar 25, 2009

Vanderbilt University, Biochemistry Dept. "Peroxiredoxin evolution and the control of eukaryotic peroxide signaling" Mar 27, 2009

Cal Poly, SLO, Veritas Forum. "On the evolution of human beings" Jan 13, 2010

Cal Poly, SLO, Chemistry Dept. "π-helices and the evolution of protein structure: a little known player makes it BIG" Jan 14, 2010

University of Colorado, Ft. Collins, Biochemistry Dept. "From peroxide signaling to π-helices: the power of an evolutionary perspective on protein structure" Mar 8, 2010

University of Ghent, Belgium "π-Helices, a living fossil protein, and insight into the origins of protein folds" May 4, 2011

University of Konstanz, Germany "A New View of π-Helices: Valuable Guides to the

Evolutionary History and Functionality of One in Six Proteins" May 10, 2011
University of Freiburg, Germany "The catalytic power and tuning for peroxide signaling of nature's dominant peroxidases" May 13, 2011
University of Konstanz, Germany "Getting membranes all ruffled up: conformational regulation of ERM-merlin proteins" May 23, 2011
University of Giessen, Germany "π-Helices, a living fossil protein, and insight into the origins of protein folds" May 25, 2011
City of Hope, Duarte, CA "The catalytic power and tuning for peroxide signaling of nature's dominant peroxidases" Jan 27, 2012
Cornell University, Ithaca, NY; BMBG Dept. "From peroxide signaling to π-helices: the power of an evolutionary perspective on protein structure" Sept 7, 2012
Oregon State University, Corvallis, OR; Pharmacy Dept. "From peroxide signaling to π-helices: the power of an evolutionary perspective on protein structure" Jan 17, 2013
University of Texas, Southwestern, Dallas, TX; Molecular Biophysics Discussion group. "From peroxide signaling to π-helices: the power of an evolutionary perspective on protein structure" Jan 24, 2013
Oregon State University, Corvallis, OR; Gilfillan Award Lecture. "Investigative Reporting on Proteins: Getting the scoop on natures tiniest machines" April 30, 2013
The Rockefeller University, New York, NY; Evnin Chemical Biology Seminar Series. "Getting better protein models from a given diffraction data set: moving beyond conventional practices" Dec. 19, 2013
Oregon State University, Corvallis, OR; Environmental and Molecular Toxicology Dept. "Getting membranes all ruffled up: conformational regulation of ERM-merlin proteins" Feb. 21, 2014
University of British Colombia, Okanagan. "π-helices, a living fossil metalloprotein, and the origins of ferritin-like proteins" Feb. 28, 2014
University of Delaware, Newark, DE; Pharmacy Dept. "From peroxide signaling to π-helices: the power of an evolutionary perspective on protein structure" Feb 9, 2015
Oregon State University, Corvallis, OR; Distinguished Professor lecture. "Teaching, Teamwork, Aha! Moments and Peering into the World of Proteins" May 21, 2015
Oxford University, Division of Structural Biology "Getting better protein models from a given diffraction data set: moving beyond conventional practices" Oct. 15, 2015
Montana Tech, Café Scientifique Public Lecture "Investigative Reporting on Proteins: Getting the scoop on nature's tiniest machines" Apr. 6, 2017
University of Texas, San Antonio "Aha! moments in structural biology: from peroxide signaling and pi-helices to mapping a conformational transition and finding value in commonly discarded X-ray diffraction data" Feb. 2, 2018

Current Research Support

NIH GM119227-01 "Mechanisms and Regulation of Peroxiredoxins". PI: LB Poole. OSU subcontract total costs: $513,466 for 4/5/16-3/31/21; $119,897 total for first year; 1.0 months effort.

Pending Research Support

NIH GRANT13002577 "The GCE4All Center: Unleashing the Potential of Genetic Code Expansion for Biomedical Research". PI: RA Mehl. $6.5 M for 12/1/20-11/310/25; 0.5 months effort. Role is as Center Associate Director for Communication. Impact Score=50

Past Research Support

Cornell Biotechnology Program, SCH-2 "Protein Folding and Assembly: Studies on the Mechanism, Function, Design and Inhibition of Enzymes". Sub-project direct costs: $72,000 for 7/1/89 - 6/30/92.

Cornell Biotechnology Program, KAR1 "X-ray Structure Determination of Ferredoxin: $NADP^+$ Reductase "Direct costs $50,000 for 7/1/89 - 6/30/92

National Science Foundation, DIR8820910, "X-ray source and Detector for Protein Crystallography." Direct costs: $178,000 for 5/1/89 - 4/30/91.

Cornell Biotechnology Program, CER-2 "Structural Studies on Transducin, the G-protein Responsible for Vision". Direct Costs $37,150 for 7/1/91 - 6/30/93; $13,150 for 7/1/92 - 6/30/93. Effort 5%.

USDA; "Mechanistic and Structural Characterization of a Bacterial Urease". Direct Costs for Cornell component: $56,952 for 9/1/93 - 8/31/95. Effort 10%. Co-PI. PI- Robert Hausinger, Michigan State University.

NIH, GM-43566-01A1 "Structure Determination of the Lymphokine GM-CSF". Direct costs: $232,002 for 9/1/91 - 8/31/94; $89,435 for 9/1/93 - 8/31/94. 20% Effort.

NSF, MCB9112699 "Structures of Ferredoxin Reductase and Old Yellow Enzyme". Direct costs: $197,672 for 7/1/92 - 6/30/95; $61,310 for 7/1/93 - 6/30/94. Effort 20%.

NIH-GM48874; "Studies in New Methods of Drug Design"
Direct costs: $724,707 for 9/1/92 - 8/31/97; Effort 21%. Co-PI with B. Ganem.
Part of Program Project grant "Crystallographic and Modeling Methods in Drug Design" with S. Ealick, D. Shalloway and B. Ganem.

National Renewable Energy Lab XAH-5-15113; "High resolution xray structure for the A. cellulyticus E1 endoglucanase catalytic domain" Direct costs: $103,572 for 3/16/95 - 12/31/97. Effort 10%.

USDA 9537500-1823; "Mechanistic and Structural Characterization Cellulases".
Direct Costs: $120,000 for 8/1/95 - 7/31/98. Effort 10%. Co-PI w/ David Wilson.

USDA 9503443 ; "Mechanistic and Structural Characterization of a Bacterial Urease".
Direct Costs for Cornell component: $90,620 for 9/1/95 - 12/31/98. Effort 10%.
Co-PI. PI- Robert Hausinger, Michigan State University.

NSF, DUE-9485324 "Computer graphics in introductory biochemistry". Direct costs: $60,577 for 5/1/95 - 4/30/99. Effort 3%.

NSF MCB9630474 "Crystallographic and other Physical Studies of Flavoenzymes" Direct costs: $178,846 for 8/15/96-1/31/99. Effort 12%.

NSF-MCB-9982727 "Crystallographic and other Physical Studies of Flavoenzymes" Total costs: $80,000 for 2/1/99-1/31/00. Effort 15%. Transfer and extension of MCB9630474)

USDA 9803562 ; "Mechanistic and Structural Characterization of a Bacterial Urease".
Total costs for OSU component: $50,400 for 9/1/98 - 11/30/00. $25,200 for current year. Effort 10%. Co-PI. PI- Robert Hausinger, Michigan State University.

NIH, GM-50389 supplement "Mechanistic Studies of Alkyl Hydroperoxide Reductase". Total costs for OSU subcontract: $124,649 for 11/1/98-6/30/02; $70,496 for current year; 10% Effort.

NW Health Foundation, NHF-2001-152 - "Structural Foundations of the dNTP Synthase Complex" Total costs: $49,601 for 8/1/01 - 7/31/02; 5% effort.

NSF-MCB-9982727 "Crystallographic and other Physical Studies of Flavoenzymes" Total costs: $570,000 for 2/1/00-1/31/06. Effort 15%.

NIH, GM-50389 "Mechanistic Studies of Alkyl Hydroperoxide Reductase". Total costs for OSU subcontract: $196,323 for 4/1/02-12/31/05; 10% Effort.

NIH, GM-36652 "Microfilament Organization and Regulation". I am a collaborator with some salary support; 4/1/03 - 3/31/07; 10% Effort.

NSF MCB-0488665 "Biochemical studies of a novel fungal protein toxic to plants" PI: Lynda Ciuffetti. Total costs ca. 490,430 for 8/1/04 - 7/31/07. 9% effort.

NIH GM-50389"Mechanistic Studies of Alkyl Hydroperoxide Reductase". PI: LB Poole. OSU subcontract total costs: $475,669 for 3/1/06-2/28/10; 1.2 months effort.

DOD NFRP W81XWH-08-1-0052 “Structure-function studies of human merlin.” OSU subcontract total costs: $404,352 (direct 277,536) for 3/1/08-2/28/12; First year costs $129,533 (direct $88,600). 1.2 months (10%) effort.

NIH NS058628 “Superoxide Dismutase, Peroxynitrite and ALS” PI: J S. Beckman, Oregon State University. Total direct costs: $872,00 for 6/1/08-5/31/12; $218,000 direct costs/year. 0.5 months (4%) effort.

NIH, GM083136 "Empirical conformation dependent covalent geometry variation in proteins". Total costs: $925,502 for 8/1/08-9/15/12; $150,00 direct costs/year. 1.5 months (12.5%) effort.

NIH-DK056649, "Nutritional Regulation of Cysteine Dioxygenase". OSU subcontract total costs: $492,599 for 4/1/09-3/31/14; First year direct $66,000. 1.0 month (8%) effort.

NIH-GM084276-01, "Dynein light chain as a dimerization hub for natively disordered proteins ". Total costs: $1.2 M direct costs for 9/1/09-8/31/14; First year direct costs $200,000. 0.5 months (4%) effort.

NIH GM-50389-17 "Mechanistic Studies of Alkyl Hydroperoxide Reductase and related redox systems". PI: LB Poole. OSU subcontract total costs: $464,181 for 5/1/10-4/30/15; $110,600 total for first year; 0.5 months effort.

NIH, GM083136 "Empirical conformation dependent covalent geometry variation in proteins". Total costs: $925,502 for 8/1/12-7/31/17; $150,00 direct costs/year. 1.5 months (12.5%) effort.

M.J. Mudock Charitable Trust “Acquisition of Multi-Source Single-Crystal Diffractometer User Facility for Chemical, Material and Biological Sciences”. PIs M Nyman, PA Karplus. Total costs $225,000 plus $225,000 OSU matching funds.

Service and memberships

To Department, College, and University

Biophysics Seminar Chairman, Spring 1991 (Cornell), 2000-2002 (OSU)
Section of Biochemistry, Molecular and Cell Biology Admissions Committee 1990-1992
Organizer for BMCB retreat 1992-1993
Director of Graduate Studies BMCB (Cornell) 1996-1998; BB (OSU) 1999-2007
College of Science Long Range Planning Committee, 1999
College of Science Biology Working Group, 2001-2
BB Executive Committee, 2001- 2006; 2011-2015
BB Faculty Search Committee Chair, 2002-3 (hired Elisar Barbar)
EHSC Biomolecular and Environmental Chemistry Research Core Leader, 2004-2012
Provost’s Initiative Computational and Genome Biology Search Committee, 2005
College of Science Community and Diversity Committee, 2006-7
BB Department Chair, June 2007- Dec 2010
College of Science P&T Committee, Winter 2008, 2010, 2014-15
College of Science Steering Committee for reorganization, Fall 2009
Provosts committee on Central Human Resources, Fall 2009
OSU Faculty Senate, 2010, 2012-2017
ASBC HR director search committee, Fall 2010
BB P&T committee (Chair), Fall 2011–2014
BB undergraduate advisor, Fall 2011–present
OSU Faculty Senate Executive Committee, 2013-2014
College of Science Strategic Planning Working Group, Winter-Spring 2014
COS Associate Dean Search Committee – Fall 2015
COS Chemistry Department Head Search Committee Chair– Winter 2017
OSU Juntos Family Day lab tour leader – Spring 2017
COS Mathematics Department Head Search Committee Chair– Spring 2018
Special Provost task force for planning and development – January 2019
COS Integrative Biology Department Head Search Committee Chair– Winter-Spring 2020
OSU Task Force on Research Continuity and Resilience – Spring 2020

To Profession

Co-chair of 1997 Proteins Gordon Conference, June 15-21, 1997; Holderness, NH

Scientific Advisory Committee, Int'l Flavins and Flavoproteins Symposia 2002 – 2014
Linus Pauling Institute Scientific Advisory Committee, 2004-2014
Co-organizer of 2007 West Coast Crystallography Workshop, Asilomar, CA
Co-organizer of 2014 Northwest Crystallography Workshop, Corvallis, OR
Center for Membrane Proteins in Infectious Diseases External Advisory Board, 2011-2015
Medical Research Foundation of Oregon Council 2016 – 2019
Advanced Light Source Structural Biology Proposal Reviewer 2016-present
Editorial Advisory Board of Protein Science (2018-present)
Reviewer for many journals (10-15 papers per year)
Ad hoc Reviewer for the following granting agencies:
NSF; NIH (BBCB Study Section Feb 1993; MSFC study section Oct 2005; ZRG1 BCMB-P panels Apr2011, Oct2011; Jun2013; Feb2015); Dept Energy; Dept Agriculture; Veterans Administration; Cornell Theory Center; Petroleum Research Fund

To Public

2003,5,6,7 guest lecture to Crescent Valley HS AP Biology
Apr 2009 Socratic Club Debate "Is Christian Faith Compatible with Evolution"
May 2013 Socratic Club Debate "Is Christianity Anti-Science"
Feb 2014-20 guest lecture in Santiam Christian HS honors Biology

Affiliations/Memberships

Oregon State University Biochemistry & Biophysics Graduate Program 1998 - present
Oregon State University Nutrition Graduate Program 2010 – present
AAAS (member #20266937)
Protein Society (member # 50474)