

Arthur Glasfeld
Department of Chemistry
Reed College
Portland, OR 97202

Professional Experience

9/13-present Amgen-Perlmutter Professor of Chemistry, Reed College

9/02-8/13 Professor of Chemistry, Reed College

10/10-5/11 Visiting scientist, Department of Biochemistry and Molecular Biology,
Oregon Health and Science University

7/02-7/03 Visiting scientist, Department of Biochemistry and Molecular Biology,
Oregon Health and Science University

9/94-8/02 Associate Professor of Chemistry, Reed College

7/95-7/96 Visiting scientist, Department of Biochemistry and Molecular Biology,
Oregon Health Sciences University

9/89-8/94 Assistant Professor of Chemistry, Reed College

2/88-8/89 Postdoctoral Fellow, Dept. of Chemistry, M.I.T., Cambridge, MA

Education

9/83-1/88 Graduate studies, Dept. of Chemistry, Harvard Univ., Cambridge, MA
(1/86-1/88 visiting scholar at ETH, Zurich, Switzerland)
MA - 9/85, PhD - 6/88

8/79-6/83 Undergraduate studies, Carleton College, Northfield, MN.
BA in chemistry (magna cum laude) - 6/83

Honors and Professional Activities

Panelist NSF-CLP I review board (10/11)
Regular Member, NIH MSFA Study Section (10/07-6/11)
Visiting Member, NIH Study Section (6/2005)
Book reviewer for *Journal of Chemical Education*
Reviewer for *J. Mol. Biol.*, *Mol. Microbiol.*, *Biochem.*
Member of the American Chemical Society
NIH Postdoctoral Fellow (1988-9)
Wood-Whelan International Scholar (1988)
General Electric Foundation Fellowship (1983-4)
James Bryant Conant Fellow (1983)

Grants

Principal Investigator

- 1/07-12/11 National Institutes of Health, AREA grant, \$210,300
“Mechanism and Specificity in Manganese Homeostasis”
- 1/04-12/06 National Institutes of Health, AREA grant, \$174,180
“Studies of Manganese Binding Regulatory Proteins”
- 9/03-8/06 National Science Foundation, MRI grant \$79,500
“MRI/REU: Acquisition of an Isothermal Titration Microcalorimeter”
- 9/02-9/04 Oregon Medical Research Foundation Seed Grant, \$21,174
“Specificity in Metal and DNA Binding by ScaR from *S. gordonii*”
- 1/90-12/91 Research Corporation, \$16,000
"Binding Studies with D-Xylose Isomerase"
- 4/90-4/94 National Institutes of Health, AREA grant, \$82,875
"A Comparative Mechanistic Study of Sugar Isomerases"
- 6/90-8/93 American Chemical Society, PRF, \$18,000
"Binding Studies with D-Xylose Isomerase"
- 7/90-6/92 National Science Foundation, ILI, \$16,149
"Graphics Workstation in the Chemistry Curriculum"

Co-Investigator

- 9/01-8/04 National Science Foundation, MRI grant \$279,641
“MRI/REU: Acquisition of a 400 MHz NMR Spectrometer for Use in Research and Research Training at Reed College”
- 7/93-6/95 National Science Foundation, ILI, \$44,999
"Using Models to Develop 'Chemical Intuition'"
- 7/93-6/95 National Science Foundation, ILI, \$68,345
"X-Ray Diffraction in the Chemistry and Physics Curriculum"

Student Coworkers (Senior thesis students denoted with *)

1989-90	Ann Dahlberg*, Marguerite Ro*, Peter Clarke, Patrick Hayes, Kirk Stevens, Timothy Tanada
1990-91	Vasilios Garyfallou*, Patrick Hayes*, Sara Mostad*, Timothy Tanada*, Hilary Trzynka*, Christopher Funk, Anitra Ingalls
1991-92	Gabriel Brandt*, Anitra Ingalls*, Melissa Melby*, Bianca Sclavi*, Ted Baughman
1992-93	Ted Baughman*, Janet Gunzner*, Katherine Hamer*, Piroska Balogh, Justina Bolz, Yi-Kang Hu, Michi Shinohara
1993-94	Piroska Balogh*, Seth Bush*, Corey Guinee*, Michi Shinohara*
1994-95	Heather Helming*, Julie Hollien*, Kitty Poundstone*, Cory Groom
1996-97	Yiming Huang*, Angela Koehler*, Kirsten Lassila*, Steven Mansoor*, Jon Sack*, Dionicio Siegel*
1997-98	Filemon dela Cruz*, Michael Quon*, Van Tran*, Danielle Vincent*
1998-99	Ian Dews*, Jon Fay*, John Howa*, Gregory Lopez*
1999-2000	Dylan Jacobs*, Clara Peck*, Marshall Miller*, Joshua Schmidt*, Hattie Brown, JJ Miranda, Corey Valdez, Alison Wellman
2000-2001	Emily Dykhuizen*, JJ Miranda*, Brian Searle*
2001-2002	Hattie Brown*, Colin Dyer*, Sarah Kliegman*, Lee Pollack*, Jon Young
2003-2004	Elham Karamooz*, Joe Kliegman, Sarah Griner, Katrina Mitchel*, Kate Stoll*
2004-2005	Cosmo Buffalo*, Amanda Cort*, Mark DeWitt, Sarah Griner*, Lee O'Neill, Zach Pegram*, Kitty Richards*, Joy Wattawa*
2005-2006	Mark DeWitt*, Will Draper*, Joe Kliegman*, Lee O'Neill*
2006-2007	Rhoda Brew-Appiah*, Kristen Grauer-Gray*, Derek Oldridge*, Kayce Spear*, Chelsea Thornburg*
2007-2008	Christine Deyo*, Amanda McGuire*, Vito Spadavecchio*, Erin Weber*

2008-2009	Bonnie Cuthbert, Carolyn Elya*, Kimberly Hartfield*, Rebecca Phillips*, Mingrui Zhang*, Rae Wannier
2009-2010	Constance Bailey*, Megan Baker*, Bonnie Cuthbert*, Alexander Diezmann, Dana Loutey, Rebecca Phillips* (spring/fall thesis)
2011-2012	Megan Duffy*, Emma Farley, Michael Gonzales*, Dana Loutey*, Rhiana Meade*, Emily Robinson*, Rukayat Taiwo*, Paul Whittredge*
2012-2013	Rachel Baden*, Erin Jacot*, Dillon Nye*, Evan Green*
2013-2014	Adrian Dannis*, Emily Drew, Natalie Farnham*, Talya Levitz*, Will McKeen*, Peter McTigue*

Publications

1. S. A. Benner, R. K. Allemann, A. E. Ellington, L. Ge, A. Glasfeld, G. F. Leanz, T. Krauch, L. Macpherson, J. A. Piccirilli and E. Weinhold, "Natural Selection, Protein Engineering and the Last Riboonorganism: Rational Model Building in Biochemistry", *Cold Spring Harbor Sym. Quant. Biol.*, **52**, 53(1987)
2. A. Glasfeld, P. Zbinden, M. Dobler, S. A. Benner, J. D. Dunitz, "X-Ray Crystal Structures of Two Dihydronicotinamides", *J. Am. Chem. Soc.*, **110**, 5512(1988)
3. A. Glasfeld, G. K. Farber, D. Ringe, T. Marcel, D. Drocourt, G. Tiraby, G. A. Petsko, "Characterization of Crystals of Xylose Isomerase from *Streptomyces violaceoniger*", *J. Biol. Chem.*, **263**, 14612(1988)
4. A. Glasfeld and S. A. Benner, "The Stereospecificity of an Iron(II) Dependent Dehydrogenase", *Eur. J. Biochem.*, **180**, 373(1989)
5. G. K. Farber, A. Glasfeld, G. Tiraby, D. Ringe and G. A. Petsko, "Crystallographic Studies of the Mechanism of Xylose Isomerase", *Biochem.*, **28**, 7289(1989)
6. T. C. Alber, R. C. Davenport, G. K. Farber, A. D. Giammona, A. Glasfeld, W. D. Horrocks, M. Kanaoka, E. Lolis and G. A. Petsko, "Crystallography and Site-Directed Mutagenesis of Two Isomerases", *ACS Symp. Ser.*, **392**, 34(1989)
7. S. A. Benner, A. Glasfeld and J. A. Piccirilli, "Stereospecificity in Enzymic Reactions", *Topics in Stereochemistry*, **19**, 127(1989)
8. A. Glasfeld, G. Leanz and S. A. Benner, "The Stereospecificities of Seven Dehydrogenases from *Acholeplasma laidlawii*:: The Simplest Historical Model that Explains Dehydrogenase Stereospecificity", *J. Biol. Chem.*, **265**, 11692 (1990)
9. P. J. Sicard, J. B. Leleu, P. Duflot, D. Drocourt, F. Martin, G. Tiraby, G. Petsko and A. Glasfeld, "Site-Directed Mutagenesis Applied to Glucose Isomerase from

Streptomyces violaceoniger and *Streptomyces olivochromogenes*.", *Ann. N. Y. Acad. Sci.*, **613**, 371-375 (1990)

10. E. G. Weinhold, A. Glasfeld, A. D. Ellington and S. A. Benner, "Structural Determinants of Stereospecificity in Yeast Alcohol Dehydrogenase", *Proc. Nat. Acad. Sci., U. S. A.*, **88**, 8420-8424 (1991).
11. A. Glasfeld, "Computer Graphics in the Biochemistry Classroom", *CUR Newsletter*, **13**(2), 55-58 (1992).
12. S. B. Mostad and A. Glasfeld, "Using High Field NMR to Determine Dehydrogenase Stereospecificity with Respect to NADH," *J. Chem. Ed.*, **70**, 504-506(1993).
13. K. N. Allen, A. Lavie, G. K. Farber, A. Glasfeld, G. A. Petsko and D. Ringe, "Isotopic Exchange plus Substrate and Inhibition Kinetics of D-Xylose Isomerase Do Not Support a Proton-Transfer Mechanism", *Biochemistry*, **33**, 1481-1487(1994).
14. K. N. Allen, A. Lavie, A. Glasfeld, T. N. Tanada, D. P. Gerrity, S. C. Carlson, G. K. Farber, G. A. Petsko and D. Ringe, "Role of the Divalent Metal Ion in Sugar Binding, Ring Opening, and Isomerization by D-Xylose Isomerase: Replacement of a Catalytic Metal by an Amino Acid", *Biochemistry*, **33**, 1488-1494(1994).
15. A. Glasfeld, M. Schumacher, H. Zalkin and R. G. Brennan, "A Positively Charged Residue Bound in the Minor Groove Does Not Alter the Bending of a DNA Duplex," *J. Am. Chem. Soc.* **118**, 13073-13074 (1996).
16. S. B. Mostad, H. L. Helming, C. Groom and A. Glasfeld, "The Stereospecificity of Hydrogen Transfer to NAD(P)⁺ Catalyzed by Lactol Dehydrogenases", *Biochem. Biophys. Res. Comm.*, **233**, 681-686 (1997).
17. M. A. Schumacher, A. Glasfeld, H. Zalkin and R. G. Brennan, "The X-ray Structure of the PurR-Guanine-*purF* Operator Complex Reveals the Contributions of Complementary Electrostatic Surfaces and a Water-mediated Hydrogen Bond to Corepressor Specificity and Binding Affinity", *J. Biol. Chem.*, **272**, 22648-22653 (1997).
18. A. J. Shusterman, P. G. McDougal and A. Glasfeld, "Dry-Column Flash Chromatography", *J. Chem. Ed.*, **74**, 1222-1223 (1997).
19. A. Glasfeld, A. N Koehler, M. A. Schumacher and R. G. Brennan, "The Role of Lysine 55 in Determining the Specificity of the Purine Repressor for its Operators through Minor Groove Interactions", *J. Mol. Biol.*, **291**, 347-361 (1999)
20. A. Glasfeld "Computer Modeling in General Chemistry" in *Interactive Learning*, David G. Brown, Ed., Anker Publishing, Bolton, MA (2000).

21. A. Glasfeld, E. Guedon, J. Helmann and R. G. Brennan "Structure of the manganese-bound manganese transport regulator of *Bacillus subtilis*." *Nat Struct Biol.* **10** 652-7 (2003).
22. J. I. Kliegman, S. L. Griner, J. D. Helmann, R. G. Brennan and A. Glasfeld "The Structural Basis for the Metal Activation of the Manganese Transport Regulator", *Biochemistry* **45**, 3493-3505 (2006)
23. M. A. DeWitt, J. I. Kliegman, J. D. Helmann, R. G. Brennan, D. L. Farrens and A. Glasfeld "The Conformations of the Metal-Free form of the Manganese Transport Regulator of *Bacillus subtilis*" *J. Mol. Biol.* **365**, 1257-1265 (2007).
24. Stoll, K. E., Draper, W. E., Kliegman, J. I., Golynskiy, M. V., Brew-Appiah, R. A. T., Phillips, R. K., Brown, H. K., Breyer, W. A., Jakubovics, N. S., Jenkinson, H. F., Brennan, R. G., Cohen, S. M. & Glasfeld, A. Characterization and Structure of the Manganese-Responsive Transcriptional Regulator ScaR. *Biochemistry* **48**, 10308-10320 (2009).
25. A. M. McGuire, B. J. Cuthbert, Z. Ma, K. D. Grauer-Gray, M. B. Brophy, K. A. Spear, S. Soonsanga, J. I. Kliegman, S. L. Griner, J. D. Helmann and A. Glasfeld "Roles of the A and C Sites in the Manganese Specific Activation of MntR" *Biochemistry* **52**, 701-713 (2013).

Electronic Publication

" A Midas Tutorial", <http://cgl.ucsf.edu/midas-info/tutorial/intro.html> September, 1995.

Presentations

"The Evolution of Dehydrogenase Stereospecificity," delivered at the Oregon Graduate Institute, October 29, 1991

"The Stereospecificity of Xylose Dehydrogenase," delivered at the 47th Meeting of the Northwest Section of the American Chemical Society, University of Montana, June 17, 1992

Ted A. Baughman and Arthur Glasfeld, "Fluorinated Carbohydrates as Mechanistic Probes in Sugar Isomerases," delivered at the 48th Meeting of the Northwest Section of the American Chemical Society, University of Wyoming, June 18, 1993

"Structural and Mechanistic Studies on D-Xylose Isomerase", Lewis and Clark College, March 2, 1994.

"Laboratory Exercises in Computer Modeling," delivered at the 208th National Meeting of the American Chemical Society, Washington, DC, August 22, 1994.

"Computer Modeling Exercises in Biochemistry," delivered at the 209th National Meeting of the American Chemical Society, Anaheim, CA, April 6, 1995.

"Structural and Mechanistic Studies on D-Xylose Isomerase", Portland State University, November 21, 1996.

"The Senior Thesis at Reed College", National Meeting of the American Society of Biochemistry and Molecular Biology, May 17, 1998.

"The Structure and Specificity of MntR, the Manganese Transport Regulator of *Bacillus subtilis*" delivered to Inorganic Chemistry Division, University of Washington, May 12, 2003.

"The Structure and Specificity of MntR, the Manganese Transport Regulator of *Bacillus subtilis*" delivered to the 11th International Conference of Biological Inorganic Chemistry, Cairns, Australia, July 27th, 2003.

"The Structure and Specificity of MntR, the Manganese Transport Regulator of *Bacillus subtilis*" delivered to the Department of Molecular and Environmental Sciences, Oregon Graduate Institute, October 17, 2003.

"The Structure and Specificity of MntR, the Manganese Transport Regulator of *Bacillus subtilis*" delivered to the Department Chemistry, Reed College, December 4, 2003.

"Metal ion selectivity of the manganese transport repressor: Structural and thermodynamic studies" poster presented to National Meeting of the American Chemical Society, March 13, 2005. Student co-authors: Sarah L. Griner and Joseph I. Kliegman

"Activation of the Manganese Transport Regulator" poster presented to the Metals in Biology Gordon Research Conference, January 30, 2006. Student co-authors: Sarah L. Griner, Joseph I. Kliegman and Mark A. DeWitt.

"Metal Binding and Activation of ScaR – A Streptococcal Manganese Regulator" poster presented at the 5th International Symposium on Biometals, July 31, 2006. Student co-authors: Rhoda Brew-Appiah, William E. Draper, Katherine E. Stoll, Joseph I. Kliegman and Hattie Brown.

"Metal Binding and Activation of the Manganese Uptake Regulator MntR" poster presented at the 18th West Coast Protein Crystallography Workshop, March 20-22nd, 2007. Student co-authors: Kristen Grauer-Gray and Kayce Spear.

"Picking Manganese Out of the Crowd" seminar presented to the Chemistry Department, Portland State University, February 13, 2009.

"The Structural Basis for Selectivity in MntR: Picking Manganese Out of the Crowd" seminar presented to Lewis and Clark College, March 3, 2009.

“Origins of Specificity in the Manganese Transport Regulator” poster presented to the 103rd National Meeting of the American Chemical Society, March 23, 2010. Student co-authors: Bonnie Cuthbert and Megan Brophy.

Symposia

Led Project Kaleidoscope workshop, "Computers in the Chemistry Curriculum," November 18, 1993, Reed College.