

Thomas J. Magliery, Ph.D.

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& Department of Biochemistry
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Positions

The Ohio State University, Columbus, Ohio

Member, Chemistry-Biology Interface Training Program (2006-present)

Member, Biophysics Graduate Program (2005-present)

Member, Ohio State Biochemistry Program (2005-present)

Assistant Professor of Biochemistry (25% appointment, 2005-present)

Assistant Professor of Chemistry (75% appointment, 2005-present)

Education and Training

Yale University, New Haven, Connecticut (2001-2005) NIH Postdoctoral Fellow, Department of Molecular Biophysics & Biochemistry, Lynne Regan Group. Research topics: Combinatorial approach to structure and stability of the four-helix bundle protein Rop. Statistical approach to design of TPR motifs. Statistical approach to binding site dissection. GFP-reassembly for detection of protein-protein interactions.

The Scripps Research Institute, La Jolla, California (1999-2001) Department of Chemistry, Peter G. Schultz Group.

Ph.D., Chemistry, University of California, Berkeley (2001) NSF Pre-Doctoral Fellow, Department of Chemistry, Peter G. Schultz Group. Thesis: "Engineering the *E. coli* translational apparatus: new genetic signals for site-specific insertion of unnatural amino acids and methodology for in vivo site-selective incorporation of unnatural amino acids."

A.B., Chemistry, Kenyon College, Gambier, Ohio (1996) Highest Honors in Chemistry. Distinction on the Senior Exercise in Chemistry. *Summa cum laude*. Phi Beta Kappa. Rosemary A. Marusak Group. Honors Thesis: "Synthesis of diimide derivatives of EDTA and investigation of their iron-mediated role in cleaving biological macromolecules."

Honors and Awards

- Nominee, College of Arts & Sciences Outstanding Teaching Award, 2006

Education and Training

- Poster Award, 15th Annual Protein Society Symposium, San Diego, CA, Aug. 5-9, 2000
- Carl Djerassi Award in Chemistry, Kenyon College, 1996
- Sigma Xi, Associate Member, Denison/Kenyon Chapter, 1996
- Phi Beta Kappa, Beta of Ohio Chapter, Kenyon College, 1995
- Robert J. Tomsich Excellence in Science Award, Kenyon College, 1994
- Kenyon College Merit List, 1993-1996 (4 years)
- Semifinalist, Westinghouse Science Search, 1992 (Work with M.E. Hodes, Medical Genetics, IUPUI)

Funding and Support

Pending

7/14/2007-7/13/2012. National Science Foundation. "CAREER: Genomic protein design: Characterization of a consensus triosephosphate isomerase and chimeric consensus TIM variants." Principal Investigator. \$935,255 total costs.

9/1/2006-8/31/2011. National Institutes of Health U54. "Engineering and Expression of Organophosphate Hydrolases as Protein Therapeutics: Engineering for Drug-Like Properties, Expression In Microalage, and Protein Glycosylation." Co-PI (Richard Sayre, PI). \$3,168,304 total costs.

9/15/2006-9/14/2011. National Institutes of Health U54. "Mechanistic, Kinetic, Spectroscopic and Computational Evaluations of OP Hydrolysis Activity of Enzymes." Co-PI (Christopher Hadad, PI). \$2,849,601 total costs.

Education and Training

- American Cancer Society Postdoctoral Fellowship, 2002 (declined)
- National Institutes of Health, NRSA F32 Postdoctoral Fellowship (NIGMS), 2002-2005
- National Science Foundation Pre-Doctoral Fellowship, 1997-2000
- Kenyon College Summer Science Fellowship, 1995
- Barry M. Goldwater Scholarship, 1995
- National Science Foundation, Research Experience for Undergraduates Summer Fellowship, 1994
- Kenyon Honor/Science Scholarship, 1992-1996 (4 years)
- National Merit Scholarship, 1992
- Robert C. Byrd Scholarship (Indiana), 1992

Publications and Research

Peer Reviewed

15. Magliery, T.J. & Regan, L. (2005) "An experimental approach to the 'inverse' folding problem: combinatorial exploration of the core of a four-helix bundle protein," manuscript in preparation.
14. Magliery, T.J. & Regan, L. (2005) "Sequence variation in ligand binding sites in proteins," *BMC Bioinformatics* **6**: 240.
13. Magliery, T.J. (2005) "Unnatural protein engineering: producing proteins with unnatural amino acids" (review), *Med. Chem. Rev. Online* **2**: 303-323.
12. Magliery, T.J.; Wilson, C.G.M.; Pan, W.; Mishler, D.; Ghosh, I.; Hamilton, A.D. & Regan, L. (2005) "Detecting protein-protein interactions with a green fluorescent protein fragment reassembly trap: scope and mechanism," *J. Am. Chem. Soc.* **127**: 146-157.
11. Magliery, T.J. & Regan, L. (2004) "Beyond consensus: statistical free energies reveal hidden interactions in the design of a TPR motif," *J. Mol. Biol.* **343**: 731-745.
10. Magliery, T.J. & Regan, L. (2004) "Combinatorial approaches to protein structure and stability" (review), *Eur. J. Biochem.* **271**: 1595-1608.
9. Magliery, T.J. & Regan, L. (2004) "A cell-based screen for function of the four-helix bundle protein Rop: a new tool for combinatorial experiments in biophysics," *Protein Eng. Des. Select.* **17**: 77-83.
8. Anthony-Cahill, S.J. & Magliery, T.J. (2002) "Expanding the natural repertoire of protein structure and function" (review), *Curr. Pharm. Biotech.* **3**: 299-315.
7. Anderson, J.C.; Magliery, T.J. & Schultz, P.G. (2002) "Exploring the limits of codon and anticodon size," *Chem. Biol.* **9**: 237-244. [See commentary: Landweber, L. (2002) "Custom codons come in threes, fours and fives," *Chem. Biol.* **9**: 143.]
6. Magliery, T.J.; Anderson, J.C. & Schultz, P.G. (2001) "Expanding the genetic code: selection of efficient suppressors of four-base codons and identification of 'shifty' 4-base codons with a library approach in *Escherichia coli*," *J. Mol. Biol.* **307**: 755-769.

5. Pastrnak, M.; Magliery, T.J. & Schultz, P.G. (2000) "A new orthogonal suppressor tRNA/aminoacyl-tRNA synthetase pair for evolving an organism with an expanded genetic code," *Helv. Chim. Acta* **83**: 2277-2286.
4. Wang L.; Magliery, T.J.; Liu, D.R. & Schultz, P.G. (2000) "A new functional suppressor tRNA/aminoacyl-tRNA synthetase pair for the *in vivo* incorporation of unnatural amino acids into proteins," *J. Am. Chem. Soc.* **122**: 5010-5011.
3. Liu, D.R.; Magliery, T.J.; Pastrnak, M. & Schultz, P.G. (1997) "Engineering a tRNA and aminoacyl-tRNA synthetase for the site-specific incorporation of unnatural amino acids into proteins *in vivo*," *Proc. Natl. Acad. Sci. U.S.A.* **94**: 10092-10097. [See commentary: Schimmel, P. & Söll, D. (1997) "When protein engineering confronts the tRNA world," *Proc. Natl. Acad. Sci. U.S.A.* **94**: 10007-10009.]
2. Liu, D.R.; Magliery, T.J. & Schultz, P.G. (1997) "Characterization of an 'orthogonal' suppressor tRNA derived from *E. coli* tRNA₂^{Gln}," *Chem. Biol.* **4**: 685-691.
1. Magliery, T.J.; Vitellaro, L.K.; Diop, N.K. & Marusak, R.A. (1997) "Fe-EDTA-*bis*amide and Fe-ADR-925, the iron-bound hydrolysis product of the cardioprotective agent dexrazoxane, cleave DNA via the hydroxyl radical," *Metal Based Drugs*, **4**: 199-205.

Invited or Contributed

6. Chin, J.W. & Magliery, T.J. (2005) "Protein expression by expansion of the genetic code." In *Encyclopedia of Molecular Cell Biology and Molecular Medicine*, 2nd ed., Vol. 11, ed. Meyers, R.A. Wiley-VCH: Weinheim, Germany, pp. 45-68.
5. Magliery, T.J. & Regan, L. (2005) "Reassembled GFP: detecting protein-protein interactions and protein expression patterns." In *Green Fluorescent Protein: Properties, Applications, and Protocols*, 2nd ed., eds. Chalfie, M.; Kain, S. John Wiley & Sons: Hoboken, NJ, pp. 391-405.
4. Wilson, C.G.M.; Magliery, T.J. & Regan, L. (2004) "Detecting protein-protein interactions with GFP fragment reassembly," *Nat. Methods*, **1**: 255-262.
3. Magliery, T.J. & Regan, L. (2004) "Library approaches to biophysical problems" (editorial overview), *Eur. J. Biochem.* **271**: 1593-1594.
2. Magliery, T.J. & Liu, D.R. (2004) "Expanding the genetic code *in vitro* and *in vivo*." In *The Genetic Code and the Origin of Life*, ed. Ribas de Pouplana, L. Landes Bioscience: Georgetown, TX, pp. 221-249.
1. Magliery, T.J.; Pastrnak, M.; Anderson, J.C.; Santoro, S.W.; Meggers, E.; Herberich, B.; Wang, L. & Schultz, P.G. (2003) "Incorporation of unnatural amino acids into proteins." In *Translation Mechanisms*, eds. Lapointe, J.; Brakier-Gingras, L. Landes Bioscience: Georgetown, TX, pp. 95-114.

Patents

2. Schultz, P.; Wang, L.; Anderson, J.C.; Chin, J.; Liu, D.R.; Magliery, T.J.; Meggers, E.L.; Mehl, R.A.; Pastrnak, M.; Santoro, S.W.; Zhang, Z. "Methods and composition for the production of orthogonal tRNA-aminoacyl tRNA synthetase pairs," Patent No. 7,083,970, August 1, 2006.
1. Schultz, P.; Wang, L.; Anderson, J.C.; Chin, J.; Liu, D.R.; Magliery, T.J.; Meggers, E.L.; Mehl, R.A.; Pastrnak, M.; Santoro, S.W.; Zhang, Z. "In vivo incorporation of unnatural amino acids," Patent No. 7,045,337, May 16, 2006.

Presentations

Invited Presentations: Academic

1. Kenyon College, Department of Chemistry, Gambier, OH, April 13, 2006. Host: John Hofferberth.

Invited Presentations: Government and Industry

1. National Cancer Institute, Frederick, Maryland, July 27, 2006. Host: Ruth Nussinov.

Invited Presentations: Conferences

2. Ohio Collaborative Conference on Bioinformatics, Ohio University, Athens, OH, June 28-30, 2006. Session: Protein Structure and Prediction. Organizer: Gerald M. Alter.
1. Metalloprotein and Protein Design Conference, Chicago, IL, July 28-30, 2005. Organizers: Sonya J. Franklin, Brian R. Gibney and David E. Benson.

Contributed Presentations and Abstracts

Posters presented at the Gordon Research Conference on Bioorganic Chemistry, 2002, 2003, and 2004.

Poster presented at the Gordon Research Conference on Proteins, 2003.

Posters presented at The Protein Society Annual Symposia, 2000, 2003, and 2004.

Invited Presentations: Education and Training

17. University of Michigan Medical School, Biological Chemistry, Ann Arbor, MI, February 24, 2005. Host: William L. Smith (faculty recruitment).
16. University of Massachusetts Medical School, Biochemistry & Molecular Pharmacology, Worcester, MA, February 2, 2005. Host: Reid Gilmore (faculty recruitment).
15. Carnegie Mellon University, Chemistry, Pittsburgh, PA, January 13, 2005. Host: Bruce Armitage (faculty recruitment).
14. University of Rochester, Chemistry, Rochester, NY, January 6, 2005. Host: Man Kit Ng (faculty recruitment).
13. Ohio State University, Biochemistry and Chemistry, Columbus, OH, December 13, 2004. Hosts: George Wang and Rob Coleman (faculty recruitment).
12. Indiana University, Chemistry, Bloomington, IN, December 7, 2004. Host: Richard DiMarchi (faculty recruitment).
11. University of Pittsburgh, Chemistry, Pittsburgh, PA, December 1, 2004. Host: Craig Wilcox (faculty recruitment).
10. University of Pittsburgh, Bioengineering, Pittsburgh, PA, November 29, 2004. Host: Sanjeev Shroff (faculty recruitment).
9. Pennsylvania State University, Chemistry, University Park, PA, November 19, 2004. Host: Phil Bevilacqua (faculty recruitment).
8. Texas A&M University, Chemistry, College Station, TX, November 15, 2004. Host: Coran Watanabe (faculty recruitment).
7. Wayne State University, Chemistry, Detroit, MI, November 11, 2004. Host: Mary Kay Pflum (faculty recruitment).
6. Oregon Health & Science University, Physiology & Pharmacology, Portland, OR, October 20, 2004. Host: David Dawson (faculty recruitment).
5. Yale University, Center for Genomics and Proteomics, New Haven, CT, February 24, 2004. Host: Nancy Kerk.
4. Université Laval, Research Center on Protein Function, Structure and Engineering (CREFSIP), Québec City, Canada, November 20, 2003. Host: Jacques Lapointe.
3. Yale University, Center for Structural Biology Seminar Series, Molecular Biophysics & Biochemistry, New Haven, CT, November 13, 2003.

2. Yale University, Molecular Biophysics & Biochemistry Departmental Retreat, Woods Hole, MA, September 28, 2002. With Lynne Regan.
1. Kenyon College, Department of Chemistry, Gambier, Ohio, October 26, 2000. Host: Rosemary Marusak.

Professional Activities

Committees and Service

Department of Chemistry

- First-Year Advisor, Biological Division (2006-2007).
- First-Year Oral Exam Committee (Summer 2006).
- Graduate Admissions Committee (Fall 2005-present).
- Departmental Seminar Committee (Fall 2005-present). Invite and host (or arrange hosts for) major seminar speakers.
- Organizer, Biological Division Journal Club (Fall 2005-present). Coordinate journal presentations and research-in-progress talks from Biological Division graduate students. Invite speakers from throughout the University and other Ohio universities.

Biophysics Graduate Program

- Annual Symposium Poster Judge (2006).

Ohio State Biochemistry Program

- Curriculum Committee (Summer 2006-present).

Meetings and Organizations

Member, Board of Directors, Ohio State Chapter of Sigma Xi (2005-present).

Professional Societies

- The Biophysical Society (2005-present)
- The Protein Society (2001-present)
- American Association for the Advancement of Science (1996-present)
- American Chemical Society (1996-present)
- Sigma Xi (Associate Member, 1996-2005; Full Member, 2005-present)

Referee

- *ChemBioChem*
- *FEBS Journal*, formerly *European Journal of Biochemistry*
- *International Journal of Biological Macromolecules*
- *Journal of the American Chemical Society*
- *Structure*

Professional Development

- Introduction to Statistics/Life Sciences (audit), Yale University, Prof. Jonathan Reuning-Scherer, 2004
- Biomolecular NMR Spectroscopy, Varian Training Course, Columbia, MD, 2003
- Bioinorganic Chemistry (audit), Yale University, Chemistry, Prof. Ann Valentine, 2002
- NAS Symposium, "A Library Approach to Chemistry and Biology," Newport Beach, CA, 1997
- ACS Short Course, "Synthetic Organic Chemistry: Modern Methods and Strategies," Chicago, IL, 1995

Teaching Activities

Courses

Biochemistry 721.03, Physical Biochemistry III (Spring 2007). 50% (co-instructor Mark Foster).

Chemistry 251, Organic Chemistry I (Winter 2007).

Chemistry 990, Combinatorial Approaches in Chemistry and Biology (Winter 2006). Advanced treatment of library methods as applied to small molecules, peptides and other oligomers, proteins, nucleic acids and materials, drawn from the primary literature. 12 students and 3 auditors.

Chemistry 251N, Organic Chemistry I (Fall 2005). The first quarter of organic chemistry, covering basic principles such as bonding, conformational analysis and stereochemistry; substitution and elimination reactions; organometallic reagents; and reactions of alkanes, alkenes and alkynes. Night section; 70 students enrolled.

Guest Lecturer

- Biochemistry 770, Protein Engineering, Richard Swenson. “*In vivo* site-specific unnatural amino acid mutagenesis.” 11/8/05.

Education and Training

University of California, Berkeley (Spring 1999) Head Teaching Assistant, Chemistry 3A (Organic Chemistry), K. Peter C. Vollhardt and Arlyn Myers. 600+ students.

University of California, Berkeley (Fall 1996 and Spring 1998) Graduate Student Instructor, Chemistry 3A (Organic Chemistry), Jean Frechet (1998), Carolyn R. Bertozzi (1996) and K. Peter C. Vollhardt (1996). About 30 students per semester.

Kenyon College, Gambier, Ohio (Fall 1993 to Spring 1996) Teaching Assistant, Organic Chemistry, Patrick O'Bannon. About 50 students per class.

Research Group (*denotes current members)

Graduate Students

*Brinda Ramasubramanian (M.Sc., Regional Engineering College, Trichy, India), Department of Chemistry, Biological Division, 1/3/06-present. Started in my group as a 1st year student.

*Mohosin Sarkar (B.Sc., University of Dhaka, Bangladesh; M.S., Kent State University), Department of Chemistry, Biological Division, 1/3/06-present. Transferred to my group as a 2nd year student from Sean Taylor.

*Christina Keventzidis (B.S., St. Lawrence University; B.S., St. John Fisher College), Department of Chemistry, Biological Division, 11/28/05-present. Transferred to my group as a 2nd year student from Sean Taylor.

*Jason Lavinder (B.S., Wright State University), Ohio State Biochemistry Program, CBIP Fellow, 11/28/05-present. Transferred to my group as a 3rd year student from Sean Taylor.

Postdoctoral Researchers

*Lihua Nie (B.S., Jiangxi Normal University, China; M.S., Beijing Normal University, China; Ph.D., Chinese Academy of Science; Humboldt Fellow, Max Planck Institute of Chemical Ecology, Germany), 2/15/06-present.

Undergraduates

Miriam Thomas (chemistry major), starting 9/18/06.

*Sanjay Hari (biochemistry major), 6/19/06-present.

*Matthew Heberling (biochemistry major), 6/12/06-present.

Trixy Syu (biochemistry major), 1/3/06-8/18/06. Graduated May 2006. Postbac research program at Academia Sinica, Taiwan.

Chang Byeon (chemistry major), 10/15/05-6/19/06. Research with Angela Gronenborn, UPMC.

Research Assistants

*Brandon Sullivan (B.S., The Ohio State University), 9/15/05-9/30/06.

Rotation Students

Scott Peachman, Chemistry, August-September 2006

Wenjing Pan, Ohio State Biochemistry Program, Spring 2006 (2nd half)

John Shimko, Ohio State Biochemistry Program, Spring 2006 (2nd half)

Robert Byrne, Ohio State Biochemistry Program, Spring 2006 (1st half)

T.J. Gordon, Ohio State Biochemistry Program, Winter 2006 (2nd half).

Thesis and Exam Committees

Doctoral Thesis (Member)

Chen Ren (Chemistry 8/4/06)

Doctoral General Exam (Chair)

Jason Lavinder (OSBP 4/19/06)

Doctoral General Exam (Member)

Ming Zhu (Chemistry TBA), David Turner (Chemistry 6/5/06)

Masters Thesis (Member)

Jen Chieh Wu (Chemistry 8/3/06), Dongha Baek (Chemistry 8/2/06)