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PERSONAL DATA:

Born:	June 13, 1958. Toledo, Ohio
Marital Status:	Married; four children
Home Address:	701 Summerset Drive, Oxford, MS 38655
Home Phone:	(662) 513-0375

EDUCATION/TRAINING

Michigan State University, Lyman Briggs College
B. S. with Honors in Biochemistry 1980
Honors Thesis: Cofactor Binding Kinetics and Crystallization of Tryptophanase (with C. Suelter and A. Tulinsky).

University of Wisconsin, Madison
Ph.D. in Cellular and Molecular Biology 1985
Thesis: Origins of Protein-DNA Binding Specificity: Observations on the *lac* Repressor-Operator Interaction (with M. T. Record Jr.).

Massachusetts Institute of Technology, Department of Biology
Postdoctoral Fellowship (with R. T. Sauer). 1986-1990

ACADEMIC POSITIONS

Assistant Professor of Biological Sciences, University of Notre Dame 1990-1998
Assistant Professor of Chemistry, University of Mississippi 1998-2003
Associate Professor of Chemistry and Biochemistry, University of Mississippi 2003 -

HONORS, AWARDS AND ACTIVITIES

NIH Predoctoral Trainee 1980-1983
Finalist, Wisconsin Sigma Xi Award for Outstanding Research Leading to the Ph.D. 1985
American Cancer Society Postdoctoral Fellow 1986-1989
Co-Organizer, 16th Annual Gibbs Conference on Biothermodynamics 2002
Member NSF Molecular Biochemistry Panel 2004 -

RESEARCH INTERESTS

DNA binding protein structure and function; Macromolecular recognition; Combinatorial mutagenesis; Protein engineering and expression; The coupling of protein folding and assembly to DNA recognition; Biophysical modeling of living systems.

PUBLICATIONS

1. Record, M. T. Jr, Anderson, C. F., Mills, P., Mossing M. & Roe, J. H. (1985) Ions As Regulators of Protein-Nucleic Acid Interactions *in vitro* and *in vivo*.. Advances in Biophysics 20, 109-135.

2. Mossing, M. C. & Record, M. T., Jr. (1985) Thermodynamic Origins of Specificity in the *lac* Repressor-Operator Interaction: Adaptability in the Recognition of Mutant Operator Sites. Journal of Molecular Biology 186, 295-305.

3. Mossing, M. C. & Record, M. T., Jr. (1986) Upstream Operators Enhance Repression of the *lac* Promoter. Science 233, 889-892.

4. Record, M. T., Jr. & Mossing, M. C. (1987) Physical Chemical Origins of Stability, Specificity and Control of Protein-DNA Interactions. In RNA Polymerase and the Regulation of Transcription. Proceedings of the 16th Steenbock Symposium. Elsevier, NY: Reznikoff, W. S., et al. (Eds.), 61-83.

5. Richey, B., Cayley, D. S., Mossing, M. C., Kolka, C., Anderson, C. F., Farrar, T. C. & Record, M. T., Jr. (1987) Variability of the Intracellular Environment of *Escherichia coli.* Journal of Biological Chemistry 262, 7157-7164.

6. Bellomy, G. R., Mossing, M. C. & Record, M. T., Jr. (1988) Physical Properties of DNA *in vivo* as Probed by the Length Dependence of the *lac* Operator Looping Process. Biochemistry 27, 3900-3906.

7. Mossing, M. C. & Sauer, R. T. (1990) Stable Monomeric Variants of *lambda* Cro Obtained by Insertion of a Designed Beta Hairpin Sequence. Science 250, 1712-1715.

8. Reidhaar-Olson, J. F., Bowie, J. U., Breyer, R.M., Hu, J. C., Knight, K. L., Lim, W. A., Mossing, M. C., Parsell, D. A., Shoemaker, K. R. & Sauer, R. T. (1991) Random Mutagenesis of Protein Sequences Using Oligonucleotide Cassettes. Methods in Enzymology 208, 564-585.

9. Mossing, M. C., Bowie, J. U. & Sauer, R. T. (1991) A Streptomycin Resistance Selection for DNA Binding Activity. Methods in Enzymology 208, 604-619.

10. Madej, T. & Mossing, M. C. (1993) Hamiltonians for Protein Tertiary Structure Prediction Based on 3-Dimensional Environment Principles. Journal of Molecular Biology, 233(3), 480-487.

11. Albright, R. A., Mossing, M. C. & Matthews, B. W. (1996) High Resolution Structure of an Engineered Cro Monomer Shows Changes in Conformation Relative to the Native Dimer. Biochemistry 35, 734-742.

12. Mollah A. K., Aleman, M. A., Albright, R.A., & Mossing, M. C. (1996) Core Packing Defects in an Engineered Cro Monomer Corrected by Combinatorial Mutagenesis. Biochemistry 35, 743-748.

13. Hazbun, T. R., Lebreton Stahura, F. & Mossing, M. C. (1997) Sequence Specific Recognition by the DNA Binding Domain of the Sine Oculis Protein. Biochemistry 36, 3680-3686.

14. Jana, R., Hazbun, T. R., Mollah, A. K., & Mossing, M. C. (1997). A Folded Monomeric Intermediate in the Formation of *lambda* Cro Dimer-DNA Complexes. Journal of Molecular Biology 273(2), 404-416.

15. Mossing, M. C. (1998). Solution Structure and Dynamics of a Designed Monomeric Variant of the *lambda* Cro Repressor. Protein Science 7(4) 983-993.

16. Jana, R., Hazbun, T. R., Fields, J. D. & Mossing, M. C. (1998) Single-chain lambda Cro repressors confirm high intrinsic dimer-DNA affinity. Biochemistry 37 6446-6455.

17. Albright, R. A., Mossing, M. C. & Matthews, B.W. (1998) Crystal Structure of an Engineered Cro Monomer Bound Nonspecifically to DNA: Possible Implications for Nonspecific Binding by the Wild-type Protein. Protein Science 7(7) 1485-1494.

18. Rupert P.B., Mollah A.K., Mossing M.C.& Matthews B.W. (2000) The structural basis for enhanced stability and reduced DNA binding seen in engineered second-generation Cro monomers and dimers. Journal of Molecular Biology 296(4):1079-1090.

19. Nilsson, M. T., Mossing, M. C. & Widersten, M. (2000) Functional expression and DNA binding affinity selection of single-chain Cro by monovalent phage display. Protein Engineering 13(7):519-526.

20. Satumba, W.J., & Mossing, M. C. (2002). Folding and assembly kinetics of lambda Cro repressor dimers is kinetically limited by proline isomerization. Biochemistry 41 14216-14224.

21. Mollah, A.K.M.M. Stennis R. L. and Mossing M. C. (2003). Stability of monomeric Cro variants: Iso-energetic transformation of a type I' to a type II' β hairpin by single amino acid replacements**.** Protein Science 12 1126-1130.

22. Maity, H., Eftink, M. R. & Mossing, M. C. (2005) Equilibrium unfolding of dimeric and engineered monomeric forms of lambda Cro (F58W) repressor and the effect of added salts: Evidence for the formation of folded monomer induced by sodium perchlorate. Archives of Biochemistry and Biophysics 434 93-107.

23. Jia, H., Satumba, W.J., Bidwell, G.L. 3rd & Mossing, M. C. (2005). Slow Assembly and Disassembly of lambda Cro Repressor Dimers. Journal of Molecular Biology. 350 919-929.

MANUSCRIPTS SUBMITTED OR IN PREPARATION

24. Maity, H., Satumba, WJ. and Mossing M.C. (in preparation) Relationship between linker length and thermodynamic stability in single-chain dimers of the lambda Cro repressor.

25. Al-Duraibi, I. James, M. T. and Mossing, M.C. (in preparation) Catalysis of Cro refolding by the *E. coli* peptidyl-prolyl isomerases SlyD and Trigger Factor.

GRANTS AND SPONSORED PROGRAMS

Structure and Function of Variant *lambda* Cro Proteins. 1R29GM46513-01
Role: Principal Investigator.
Sponsor: National Institutes of Health.
Dates: May 1992- April 1998.
Award Amount: $514,000

Structure and Function of Oncogene-Related Homeodomains.
Role: Postdoctoral Mentor.
Sponsor: Walther Cancer Institute.
Dates: June 1995 - June 1997.
Award Amount: $76,000.

A high-speed, high-capacity centrifuge for biochemical teaching and research
Role: Principal Investigator
Sponsor: Associates Grant Program, University of Mississippi
Dates: December, 1998
Award Amount: $13,746

Linkage of protein folding and assembly to DNA recognition. NSF# 9874613
Role: Principal Investigator
Sponsor: National Science Foundation
Dates: May 1999- April 2003.
Award Amount: $370,000

Protein engineering studies to explore the topology of a gene regulatory complex
Role: Principal Investigator
Sponsor: Faculty Research Program, University of Mississippi
Dates: Summer, 1999
Award Amount: $3,500

Acquisition of Differential Scanning and Isothermal Titration Calorimeters
Role: Co - Principal Investigator,
Sponsor: National Science Foundation
Dates: November 1, 1999.
Award Amount: $71,826

Mississippi EPSCoR Research Infrastructure Improvement Program
Role: Subcontractor. Protein structure group.
Sponsor: National Science Foundation
Dates: May 15 , 2002 – Sept. 14 , 2003
Award Amount: $18,000

Linkage of protein folding and assembly to DNA recognition. NSF# MCB-0317026
Role: Principal Investigator
Sponsor: National Science Foundation
Dates: 09/01/2003 – 08/31/2006
Award Amount: $349,803

PROFESSIONAL SOCIETIES

The Gibbs Society for Biothermodynamics, American Chemical Society, Biophysical Society, The Protein Society, AAAS.

PEER REVIEW

Ad hoc research grant reviewer: Human Frontiers Science Program;
Veterans Administration Internal Research Program, National Science Foundation
Ad hoc manuscript reviewer: Journal of Molecular Biology
Biochemistry; Protein Science, Journal of Biological Chemistry;
Proceedings of the National Academy of Sciences, USA, Biophysical Journal
Member NSF Advisory Panel for Molecular Biochemistry 2004 - 2006

GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS TRAINED

A. K. M Moniruzziman (Shopon) Mollah, **Ph. D.** University of Notre Dame. March 1996.
Dissertation title: Stability and Engineering of *lambda* Cro Repressor Variants.

Tony R. Hazbun, **Ph. D.** University of Notre Dame. August 1997.
Dissertation title: Protein-Protein and Protein-DNA Interactions in Gene Regulation.

Rinku Jana, **Ph. D.** University of Notre Dame. July 1998.
Dissertation title: Dimerization and Folding are Coupled to DNA Binding by the lambda Cro Repressor: Uncoupling the Linked Equilibria Through Structure Based Design.

Florence Lebreton Stahura, Walther Cancer Institute **Postdoctoral** Fellow, 1995-1997.
Fellowship title: Structure and Function of Oncogene-Related Homeodomains.

John Satumba, **Ph.D.** University of Mississippi. June 2003.
Dissertation title : Folding And Assembly Studies Of The Bacteriophage Lambda Cro Repressor Protein And Selected Variants.

Rhonda Stennis, **M.S.** University of Mississippi. July 2003.
Thesis title: Thermodynamic Stability of Cro Monomers and Dimers.

Mita Maity, **M.S.** University of Mississippi. April 2004.
Thesis title: The Folding / Unfolding pathway of Cytochrome *c*. Research completed in the laboratory of Dr. Walter Englander at the University of Pennsylvania.

Ibrahim Alduraibi, Ph.D. candidate, admitted to the program in full standing January 2000.
Thesis project: Catalysis of Cro refolding by E. coli peptidyl-prolyl cis-trans isomerases.

Haifeng Jia, Ph.D. candidate, admitted to the Ph.D. program August 2000.
Thesis project: Equilibrium dimerization and subunit exchange kinetics by fluorescence resonance energy transfer.

Lei Wang, Ph.D. student, admitted to the Ph.D. program December 2004.
Thesis project: DNA binding by Cro Variants: Kinetic and equilibrium studies.

Yin Gu, Ph.D. student, admitted to the Ph.D. program August 2004.
Thesis project: Molecular studies of Cro folding, assembly and repression *in vivo*