Elizabeth E. Trimmer

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EDUCATION

GRANTS AND FELLOWSHIPS

2019-2020	Grinnell College Research Grant ($14,200)
2018-2019	Grinnell College Research Grant ($17,000)
2017-2018	Grinnell College Research Grant ($12,350)
2016-2017	Grinnell College Research Grant ($10800)
2014-2015	Grinnell College Sabbatical Leave (year at full pay)
2014-2015	Grinnell College Research Grant ($3,200)
2013-2014	Grinnell College Research Grant ($14,200)
2012-2013	Grinnell College Research Grant ($11,300)
2011-2012	Grinnell College Research Grant ($10,900)
2009-2010	Grinnell College Research Grant ($16,900)
2007-2008	Grinnell College Study Leave in combination with Sabbatical Leave (year at full pay)
2006-2007	Grinnell College Research Grant ($1500)
2003-2005	American Chemical Society Petroleum Research Fund, Type G Grant ($35,000)

Sept. 2009	Tenure Review for Gustavus Adolphus College
October 2008	Manuscript Review for the Journal of Chemical Education
May 2007	Tenure Review for Pomona College

INSTITUTIONAL SERVICE

2020-present	Chemistry Department Chair
2018-2020	College Curriculum Committee (member)
2016-present	Institutional Biosafety Committee (member)
2015-2017	College Personnel Committee (member)
2015	HHMI Grant Planning Committee (submitted pre-proposal December 2015, not funded)
2012-present	Ad hocNoyce Science Center Power Outage Committee
2005-11, 13-14	Institutional Animal Care and Use Committee (chair)
2010-2011	HHMI Grant Planning Committee (submitted October 2011, funded)
2011-2013	Institutional Animal Care and Use Committee (member)
2010-2012	Grinnell Science Division (chair), Grinnell Executive Council (member)
2010-2013	Interdisciplinary Studies Advisory Board (member)
2009-2010	Grinnell Science Project (co-director)
2008-2010	Health Professions Advisory Committee (co-chair)
2000-present	Biological Chemistry Committee (member)
2008-2011	HHMI Grant Planning Committee for support of interdisciplinary work (submitted October 2008, funded)
2006-2007	Biological Chemistry Committee (chair)
2001-03, 08-09	Teacher Education Committee
2002-2007	Health Professions Advisory Committee (member)
2006-2007	Science Teaching and Learning Discussion Group (leader)
2006-2007	Chemistry Department Seminar Coordinator
2004-2007	Noyce Science Center Building Planning Committee
2002-2007	Faculty director of Grinnell College American Chemical Society student group
2004-2007	HHMI Grant Planning Committee for support of biological chemistry major (submitted October 2004, funded)
2004-2006	Off-Campus Study Committee

COURSES TAUGHT

General Chemistry (2000-2003; 2008-2011, 2013, 2019)
Analytical and Inorganic Chemistry (2003, 2016, 2018)
Organic Chemistry I (2001, 2003-2006, 2008-2010, 2012-2019)
Organic Chemistry II (2006)
Introduction to Biological Chemistry (2002-2003, 2005-2010, 2012-2014, 2015, 2017-2020)
Enzyme Mechanisms/Bioorganic Chemistry (2001, 2002, 2004, 2006, 2008, 2011, 2013, 2016, 2018, 2020)
Chemistry of Artists' Materials (2012, 2014, 2017)
Restoration of the Sistine Chapel Ceiling – Chemistry and Controversy (tutorial, 2005)
Papermaking – a Chemistry Approach (tutorial, 2010)
Detecting Art Forgeries by Visual and Scientific Analyses (tutorial, 2018)

PUBLICATIONS (Undergraduate co-authors in italics.)

Zuo, C., Jolly, A.L., Satzer, D.I., Nikolova, A.P., Cao, S., Sanchez, S., Ballou, D.P. and Trimmer, E.E. March 15, 2018. A Role for Glutamine 183 in the Folate Oxidative Half-Reaction of E. coli Methylenetetrahydrofolate reductase. Arch. Biochem. Biophys., 642, 63-74.

Trimmer, E.E., Wanninayake, U.S., and Fitzpatrick, P.F. March 29, 2017. Mechanistic Studies of an Amine Oxidase Derived from D-Amino Acid Oxidase. Biochemistry, 56, 2024-2030.

Trimmer, E. E. April 2013. Methylenetetrahydrofolate Reductase: Biochemical Characterization and Medical Significance, a Review in Current Pharmaceutical Design (M. Medina, M. Martinez-Julvez, P. Ferreira eds.), 19, 2574-2593.

Lee, M.N., Takawira, D., Nikolova, A.P., Ballou, D.P., Furtado, V.C, Phung, N.L., Still, B.R., Thorstad, M.K., Tanner, J.J., and Trimmer, E.E. August 18, 2009. A Functional Role for the Conformationally Mobile Amino Acid Phenylalanine 223 in the Reaction of Methylenetetrahydrofolate Reductase from Escherichia coli Biochemistry, 48, 7673-7685.

Mohrig, J. R., Carlson, H.K., Coughlin, J.M, Hofmeister, G.E., McMartin, L.A., Rowley, E.G., Trimmer, E.E., Wild, A.J., and Schultz, S.C. February 2, 2007. Novel Syn Intramolecular Pathway in Base-Catalyzed 1,2-Elimination Reactions of E-Acetoxy Esters. J. Org. Chem., 72(3), 793-798.

Trimmer, E.E., Ballou, D.P., Galloway, L.J., Scannell, S.A., Brinker, D.R., and Casas, K.R. May 10, 2005. Aspartate 120 of Escherichia coli Methylenetetrahydrofolate Reductase: Evidence for Major Roles in Folate Binding and in Catalysis, Minor Role in Flavin Reactivity. Biochemistry, 44, 6809-6822.

Ballou, D.P., Yamada, K., Pejchal, R., Ludwig, M.L., Matthews, R.G., Trimmer, E.E. 2002. Studies of

Trimmer, E.E., Zamble, D.B., Lippard, S.J., and J.M. Essigmann. January 6,1998. Human testis-determining factor SRY binds to the major DNA adduct of cisplatin and a putative target sequence with comparable affinities. Biochemistry, 37, 352-362.

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M. abolic Pathways (W1.erville Valley, NH), July 16-21, 2017.

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hydrofol1.00reductase” byrTT4 1 66 TDn7.

"Stopped-flow and Kinetic Isotope Studies of the Oxidative Half-Reaction Catalyzed by Flavin Enzyme Methylenetetrahydrofolate Reductase from

"Probing the Roles of Phe 223 and Gln 183 in Methylenetetrahydrofolate Reductase from *Escherichia coli*" by E. E. Trimmer, A. L. Jolly, D. Takawira, A. P. Nikolova, M. N. Lee, and S. Cao, poster presentation by E. E. Trimmer at the 2006 Gordon Research Conference on Enzyme, Coenzymes, and Metabolic Pathways, (Biddeford, ME), July 17-21, 2006.

"Discovery-based Exercises in Infrared Spectroscopy" by J. G. Lindberg, H. Trujillo, E. E. Trimmer, and T.A. Mobley, poster presentation by J. G. Lindberg in the Division of Chemical Education at the 2006 American Chemical Society National Meeting, (Atlanta, GA), March 26-30, 2006.

"Aspartate 120 of *Escherichia coli* Methylenetetrahydrofolate Reductase: Evidence for Major Roles in Folate Binding and in Catalysis, Minor Role in Flavin Reactivity" by E.E. Trimmer, D.P. Ballou, L.J. Galloway, S.A. Scannell, D.R. Brinker and K.R. Casas, poster presentation by E. E. Trimmer at the 2005 Gordon Research Conference on Enzyme, Coenzymes, and Metabolic Pathways, (Biddeford, ME), July 17-22, 2005.

"Aspartate 120 of *Escherichia coli* Methylenetetrahydrofolate Reductase: Evidence for Roles in Folate Binding and in Catalysis" by E.E. Trimmer, L.J. Galloway, S.A. Scannell, K.R. Casas, D.R. Brinker, D.P. Ballou, R. Pejchal, and M.L. Ludwig, poster presented by E. Trimmer at FASEB Summer Research Conference on Folic Acid, Vitamin B_{12} and One-Carbon Metabolism (Snowmass, CO), August 1, 2004.

"Folate Binding and Catalysis in Methylenetetrahydrofolate Reductase from *Escherichia coli*: Insights into Roles for Aspartate 120 from Site-directed Mutants", E. E. Trimmer, K.R. Casas, S.A. Scannell, L.J. Galloway, D.R. Brinker, E.W. Burke, R.Y.H. Mohamed, poster presented by E. Trimmer at the 2003 Gordon Research Conference on Enzyme, Coenzymes, and Metabolic Pathways, (Meriden, NH), July 13-18, 2003.

"Folate Binding and Catalysis in Methylenetetrahydrofolate Reductase from *Escherichia coli*: Insights into Roles for Aspartate 120 from Asp120Asn and Asp120Ser Mutants", E.E. Trimmer, K.R. Casas, D.R. Brinker, R. Pejchal, and M.L. Ludwig, poster presented by E. Trimmer at FASEB Summer Research Conference on Folic Acid, Vitamin B_{12} and One-Carbon Metabolism (Snowmass, CO), August 5, 2002.

"An Unprecedented Acidic Residue (Aspartate 120) at the N1-C2=O Flavin Locus in Methylene-tetrahydrofolate Reductase from *Escherichia coli*: Redox and Kinetic Studies of Wild-type and Asp120Asn MTHFR", E.E. Trimmer, E.W. Burke, R.Y.H. Mohamed, R. Pejchal, D.P. Ballou, M.L. Ludwig, and R.G. Matthews, poster presentation by E. Trimmer at the 14th International Congress on Flavins and Flavoproteins (Cambridge, U.K.), July 15, 2002.

"Characterization of two *E. coli* methylenetetrahydrofolate reductase (MTHFR) mutants, Asp120Asn and Glu28Gln", E.E. Trimmer, D.P. Ballou, M.L. Ludwig, and R.G. Matthews, poster presented by E. Trimmer at FASEB Summer Research Conference on Folic Acid, Vitamin B_{12} and One-Carbon Metabolism (Snowmass, CO), August 5, 2000.

"Characterization of two *E. coli* methylenetetrahydrofolate reductase (MTHFR) mutants, Asp120Asn and Glu28Gln", E.E. Trimmer, B.D. Guenther, M.L. Ludwig, and R.G. Matthews, poster presented by E. Trimmer at 13th International Congress on Flavins and Flavoproteins (Konstanz, Germany), August 29, 1999.

PRESENTATIONS BY UNDERGRADUATE COLLABORATORS

"Kinetic Characterization of Mutant Methylenetetrahydrofolate Reductase Enzymes Leu277Ala and Leu277Ile", by J. Hua, T. Tran, J. Chien, and E.E. Trimmer, poster presented by J. Hua at the Midwest Enzyme Chemistry Conference, (Chicago, IL), October 26, 2019, October 24, 2020 (virtual).

"Kinetic Characterization of Mutant Methylenetetrahydrofolate Reductase Enzyme Phe184Ala", by Z. Liu, J. Chien, and E.E. Trimmer, poster presented by Z. Liu at the Midwest Enzyme Chemistry Conference, (Chicago, IL), October 26, 2019, October 24, 2020 (virtual).

“The Role of Ser26 in the Catalysis of E. coli MTHFR", by Y. Pan, M. Tetrick, R. Li, J.U. Seng, and E.E. Trimmer, poster presented by ,

Elizabeth E. Trimmer, 11/2020

“Construction of Gln183Ala and Gln183Glu Mutants of Methylenetetrahydrofolate Reductase (MTHFR) and Kinetic Characterization of Phe223Ala MTHFR", A. Nikolovaand E. E. Trimmer, poster presented by A. Nikolova

Jeremy Sanchez (’14). Kinetic Characterization of Methylenetetrahydrofolate Reductase (MTHFR) Gln183Ala and Gln183Glu Mutants, Summer 2012, Spring 2013, Spring 2014.

Nicolas Bonamici (’14). pH-dependent Studies of Asp120Ala *E. coli* Methylenetetrahydrofolate Reductase, Summer, Fall 2012

Jingjing Wang (’13). pH-dependent Studies of *E. coli* Methylenetetrahydrofolate Reductase, Summer, Fall 2011, Spring 2012, Spring 2013.

Metzere Bierlein De la Rosa (’13). Investigation of *E. coli* Methylenetetrahydrofolate Reductase Enzyme/Folate Complexes by Absorbance and Fluorescence Spectroscopy, Summer, Fall 2011.

Yanwen Xu (’11). Nonenzymatic Model Studies for the Oxidative Half-Reaction of MTHFR that Adopt Organic Catalysts and Trapping, Spring 2010.

Ivy Hsieh (’10). Proton Uptake Studies of the Methylenetetrahydrofolate Reductase (MTHFR) Folate Half-Reaction, Summer, Fall 2009.

Tianqi Zhang (’11). Kinetic and Thermodynamic Model Studies of 5, 10-methylenetetrahydrofolate Nonenzymatic Conversions, Summer, Fall 2009; Spring 2010.

David Satzer (’11). Kinetic Characterization of Methylenetetrahydrofolate Reductase (MTHFR) Mutant Enzymes Gln183Ala and Gln183Glu, Summer 2009.

Moon (Ryan) N. Lee (’07). Characterization of Methylenetetrahydrofolate Reductase (MTHFR) Mutant Enzyme Phe223Leu, Summer 2006, Fall 2006, Spring 2007.

Sirui Cao (’08). Characterization of Methylenetetrahydrofolate Reductase (MTHFR) Mutant Enzyme Gln183Ala, Spring 2006, Summer 2006, Fall 2006, Spring 2007.

Andriana Nikolova ('07). Construction of *E. coli* MTHFR mutants Gln183Ala, Glu, Phe223Ala, Leu. Spring, Fall 2005; Spring, Fall 2006, Spring 2007.

Desire Takawira ('06). Construction and Characterization of Methylenetetrahydrofolate Reductase (MTHFR) Mutant Enzymes Phe223Leu and Phe223Ala, Summer, Fall 2005.

Amber Jolly ('06). Characterization of Methylenetetrahydrofolate Reductase (MTHFR) Mutant Enzyme Gln183Glu, Summer 2005, Fall 2005, Spring 2006.

M. Catherine O’Conor ('04). pH dependence of *E. coli* MTHFR. Summer, Fall 2003.

Lara J. Galloway ('05). Investigation of the protonation state of the flavin hydroquinone in wild-type and Asp120Asn MTHFR. Spring, Summer, Fall 2003.

Sara A. Scannell ('05). Kinetic Characterization of MTHFR Mutant Enzymes. Spring, Summer 2003.

Katie R. Casas ('04). Kinetic characterization of Asp120Ser MTHFR mutant enzyme. Summer, Fall 2002.

Rania Heather Mohamed ('03). Anaerobic studies of the flavin enzyme MTHFR. Spring, Summer 2002.

Danielle R. Brinker ('02). Construction of *E. coli* MTHFR mutant Asp120Ser. Summer, Fall 2001.

Emily W. Burke ('02). Investigation of ionization state of flavin in MTHFR. Spring 2001, Summer 2001, Fall 2001, Spring 2002.