

T O M M I W H I T E

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Education

- 2002-2007 Ph.D. Biochemistry, University of Missouri
1997-2000 B.S. Biochemistry with Honors, University of Missouri

Fellowships

- 2007-2012 Cancer Research Training Award – Post-Doctoral Fellow, National Cancer Institute

Research Experience

- 2012-present Assistant Research Professor of Biochemistry, University of Missouri
Pursue ultrastructural imaging and protein structure determination using electron microscopy, with SEM, TEM and cryo-EM methods. Collaborators include Gerald Hazelbauer, Filiz Bunyak, Ed Gogol, Mark Fisher, Bret Ulery, Peter Pfeifer, Suchi Guha, Michele Warmund, Stefan Sarafianos & Jack Tanner.
- 2012-present Associate Director, Electron Microscopy Core Research Facility, University of Missouri
Assist both campus and external clients with determining which microscopy method is best suited for answering their research questions. After client consultation, proper sample preparation services and data collection are completed or clients trained to perform these tasks. Supervise staff of 4 full time and 3 part-time student employees. Proactively educate campus investigators on which methods may be suitable to answer their research questions and encourage their use of the Electron Microscopy Core facility, as well as other research core facilities on campus. Instrumentation includes FEI Quanta 600F ESEM, FEI Tecnai F30 Twin TEM, and FEI Scios Analytical Dualbeam.
- 2007-2012 Post-Doctoral Fellowship, National Cancer Institute – Bethesda, Maryland
Dr. Sriram Subramaniam, Biophysics Section, Lab of Cell Biology
Determining the quaternary structure of simian immunodeficiency virus (SIV) Envelope Glycoproteins using 3 dimensional averaging of cryo-electron tomographic sub-volumes to guide immunogen design for HIV-1/AIDS vaccine development.
- 2002-2007 Ph.D., University of Missouri – Columbia, Missouri
Dr. John Tanner, Departments of Biochemistry & Chemistry
Unraveling mechanisms of proline degradation by proline dehydrogenase and PutA multifunctional proteins by functional characterization utilizing kinetic, biophysical, biochemical studies and by X-ray protein crystallographic structure determination.
- 2001-2002 Research Specialist, University of Missouri – Columbia, Missouri
Dr. Kevin Fritsche, Department of Nutrition
Assessing the effects of fish oil on murine immunity and immune responses to bacterial pathogen, *Listeria monocytogenes*.
- 2000 Contract Employee, Pharmacia Corporation – St. Louis, Missouri
Dr. Amy Halseth, Cardiovascular and Metabolic Diseases Department
In various animal models, characterized effects of compounds shown to enhance reverse cholesterol transport to lower LDL cholesterol levels and increase HDL cholesterol levels.
- 2000 Summer Intern, Pharmacia Corporation – St. Louis, Missouri
Dr. Amy Halseth, Cardiovascular and Metabolic Diseases Department
Developed high-throughput assay from previously reported one in literature to assess phosphorylation of 5' AMP-activated protein kinase due to pharmacological treatment.

- 1999-2000 Life Science Undergraduate Research Opportunity Program (LSUROP) Undergraduate Researcher, University of Missouri – Columbia, Missouri
Dr. Joseph Polacco, Department of Biochemistry
Investigated mechanisms of nitrogen transport using *Escherichia coli* bacteria by making mutations of different transporters.
- 1998 Summer Intern, Monsanto – St. Louis Missouri
Susan Colburn, Analytical Sciences Division
Using transmission electron microscopy, determined where biodegradable plastic product of genetic modification was stored in various plant tissues.

Publications

<http://www.ncbi.nlm.nih.gov/myncbi/browse/collection/41554170/?sort=date&direction=descending>

W.D. Gilstrap, W. Luo, T.A. White, J.R.Ferguson “Production, location and technology of painted pottery from the Yagshou Culture in central China” *manuscript in preparation*

D. Stalla, F. Seydel, A. Gillespie, M. Sweany, T. Lam, T.A.White, M. Lee, P. Pfeifer “Spectroscopic Investigations of the Structure of Graphitic Carbon Nitrides for H₂ Storage” *manuscript in preparation*

N. Akkaladevi, F. Bunyak Ersoy, M. Lin, , T.A. White, G. Hazelbauer “Conformational States of the *E.coli* Aspartate Chemoreceptor” *Manuscript in Preparation*

S Khanra, T. Ciprano, T.F. Lam, T.A. White, E.E. Fileti, W.A. Alves, S. Guha. “Self Assemble Peptide:Polyfluorene Nanocomposites for Biodegradable Organic Electronics” *Advanced Materials Interfaces* (2015) 2(14)

G.A. Frank, A. Bartesaghi, O. Kuybeda, M.J. Borgnia, T.A. White, G. Sapiro, S. Subramaniam. “Computational separation of conformational heterogeneity using cryo-electron tomography and 3D sub-volume averaging” *Journal of Structural Biology* (2012) 128(2):165-76

T.A. White, A. Bartesaghi, M.J. Borgnia, M.J.V. de la Cruz, J.W. Bess, R. Nandwani, J.L.S. Milne, and S. Subramaniam. “Three-dimensional structures of soluble CD4-bound states of trimeric SIV envelope glycoproteins determined using cryo-electron tomography” *Journal of Virology* (2011) 85(23):12114-23

J.R. Meyerson, T.A. White, D.M. Schauder, B. Kim, J. Kim, J. Sununu, L. Yang, R. Nandwani, A. Bartesaghi, M.J. Borgnia, S. Subramaniam. “Molecular structures of HIV-1 envelope glycoproteins: A team effort” *Journal of Visualized Experiments* (2011) 58:2770

T.A. White, A. Bartesaghi, M.J. Borgnia, J.R. Meyerson, M.J.V. de la Cruz, J.W. Bess, R. Nandwani, J.A. Hoxie, J.D. Lifson, J.L.S. Milne, and S. Subramaniam. “Molecular architectures of trimeric HIV-1 and SIV envelope glycoproteins on intact viruses: Strain-dependent variation in quaternary structure” *PLoS Pathogens* (2010) 6(12):e1001249

D. Srivastava, J.P. Schuermann, T.A. White, N. Krishnan, G. Hura, A. Tan, M. Henzl, D. Becker, J. Tanner. “Crystal structure of the bifunctional proline utilization A flavoenzyme from *Bradyrhizobium japonicum*” *Proceedings of the National Academy of Sciences* (2010) 107(7):2878-83.

J.P. Schuermann, T.A. White, D. Srivastava, D.B. Karr, J.J. Tanner. “Three crystal forms of the bifunctional enzyme proline utilization A (PutA) from *Bradyrhizobium japonicum*” *Acta Crystallographica* (2008) F64, 949-953

T.A. White, W.H. Johnson, C. Whitman, and J.J. Tanner. “Mechanism-Based Inactivation of *Thermus thermophilus* Proline Dehydrogenase” *Biochemistry* (2008) 47(20),5573-80

T.A. White, N. Krishnan, D.F. Becker and J.J. Tanner. “Structure and Kinetics of monofunctional proline dehydrogenase from *Thermus thermophilus*” *Journal of Biological Chemistry* (2007) 282(19), 14316-27

C.A. Bottoms, T.A. White, and J.J. Tanner “Exploring structurally conserved solvent sites in protein families” *Proteins: Structure, Function and Bioinformatics* (2006) 64(2), 404-421

T.A. White & J.J. Tanner “Cloning, purification and crystallization of *Thermus thermophilus* proline dehydrogenase” *Acta Crystallographica* (2005) F61, 737-739

M. Zhang, T.A. White, J.P. Schuermann, B.A. Baban, D.F. Becker and J.J. Tanner. "Structures of the *Escherichia coli* PutA Proline Dehydrogenase Domain in Complex with Competitive Inhibitors" *Biochemistry* (2004) 43, 12539-12548

A.E. Halseth, N.J. Ensor, T.A. White, S.A. Ross, and E.J. Gulve "Acute and chronic treatment of *ob/ob* & *db/db* mice with AICAR decreases blood glucose concentrations" *Biochemical and Biophysical Research Communications* (2002) 294, 798-805

Grants

Cryo-EM Supplement for NIGMS Award 5R01GM065546-10 "Structural Studies of the Multifunctional PutA Protein"
J.J. Tanner, T.A. White, W. Jiang
\$200,000 – Under review
Award Period: 2016-2018

"OnTimeURB: Secure Framework for Remote Instrumentation Allocation, Control & Data-Intensive Science Applications" – Cybersecurity Innovation for Cyberinfrastructure, National Science Foundation
P. Calyam, T. Joshi, D. Xu, T.A. White, I. Jahnke
\$747,658 – Under review
Award Period: 2017-2019

"Data and Disease Driven Biomedical Informatics Training at University of Missouri" – National Library of Medicine Institutional Training for Research Training in Biomedical Informatics and Data Science
C.R. Shyu, K. Palaniappan, D. Shin, T.A. White
\$1,000,000 – Under Review
Award Period: July 1, 2017 – June 30th, 2022

"Midwest Consortium for High Resolution Cryoelectron Microscopy" - *NIH Regional Consortia U24*
W. Jiang, RJ Kuhn, J. Lanman, M. Rossmann, E. Bullitt, K. Parent, S. Hafenstein, W. Dai, T. Dokland, M. Stowell, T. Liang, M. Rademacher, T.A. White, S. Monerrat, T. Ruiz
\$3,518,760 – Under review
Award Period: December 2016 – November 30, 2021

"*Neolithic Technological Traditions of Central China*" – *University of Missouri Research Council*
Tommi A. White & William Gilstrap
Goal: Characterize ancient Chinese (Yang Shao Culture) painted pottery to determine places of manufacture, reconstructing production technology, identifying regional distribution and consumption.
\$10,000 - Funded
Award Period: February 2016-September 2015

"SmartµScope: A Microscopy Image Analysis App for Mobile Platforms" *MU Information Technology Interdisciplinary Innovations Fund*
F. Bunyak Ersoy, T.A. White, M. Sun, M. Warmund, K. Palaniappan
\$18,972 - Funded
Award Period: January 2015-January 2016

Honors and Awards

2012	Fellows Award in Research Excellence
2007	Donald K. Anderson Graduate Research Assistant Award
2006-2007	Preparing Future Faculty Fellow
2006	Graduate Student Association Superior Graduate Achievement Award
2006	Graduate Professional Council Travel Grant Award
2006	Graduate Student Association Travel Grant Award
2005	American Crystallographic Association Travel Grant Award

Professional Societies

2012-present Central States Microscopy and Microanalysis Society
2012-present Microbeam Analysis Society
2010-present Microscopy Society of America
2007-present Chesapeake Society for Microscopy
2007-present Association for Women in Science
2005-present American Chemical Society
2004-present Griffiths Leadership Society for Women
2004-present American Crystallographic Association

Activities

2017-2020 Biological Tutorials Organizer - Microscopy and Microanalysis Meeting
Summer 2016 75th Anniversary Committee on Future Directions of the Microscopy Society of America
2016-present Founding member – Midwest Regional Core Facilities Characterization Lab Managers
2012-present Webmaster & Secretary, Central States Microscopy and Microanalysis Society
2012-2014 President, Central States Microscopy and Microanalysis Society
2010-2011 President, Chesapeake Society for Microscopy
2009-2014 Reviewer – Acta Crystallographica F
Spring 2007 Initiated and developed University of Missouri Alumni Association's "Spirit of Martha" Award which spawned the Awards and Recognition Committee for the Griffiths Leadership Society for Women

Teaching Experience

2014-present Biochemistry 9001 "Protein Structure Determination with Electron Microscopy" – Course Instructor
2012-present Physics 4190 "Physics and Chemistry of Materials" – Lab Instructor
2012-present Veterinary Pathobiology "Cellular Light and Electron Microscopy" – Lab Instructor
2012-present Physics 7230 "Electron Microscopy and Microanalysis" – Course Instructor
Winter 2010 Foundation for Advanced Education in the Sciences – Lead Instructor "Imaging at the Nanoscale" Bethesda, MD
March 2007 Truman State University Biochemistry – Guest Lecturer, Kirksville, MO
Winter 2004 University of Missouri Biochemistry I – Teaching Assistant, Columbia, MO
Winter 2000 University of Missouri Biotechnology in Society – Peer Assistant, Columbia, MO

Electron Microscopy Data Bank Depositions

EMD-5272 - Molecular Structure of Unliganded Native SIVmneE11S gp120 trimer: Spike region

EMD-5273 - Molecular Structure of Unliganded Native SIVmac239 gp120 trimer: Spike region

EMD-5274 – Molecular Structure of Unliganded Native CP-MAC gp120 trimer: Spike region

Protein Data Bank Depositions

2EKG Structure of *Thermus thermophilus* Proline Dehydrogenase inactivated by *N*-propargylglycine

2G37 Structure of *Thermus thermophilus* L-proline dehydrogenase

1TIW *Escherichia coli* PutA PRODH domain complexed with L-THFA

1TJ0 *Escherichia coli* PutA PRODH domain co-crystallized with L-lactate

1TJ1 *Escherichia coli* PutA PRODH domain complexed with L-lactate

1TJ2 *Escherichia coli* PutA PRODH domain complexed with L-acetate

3HAZ *Bradyrhizobium japonicum* Bifunctional Proline Utilization A (PutA) protein

Electron Microscopy Data Bank Depositions

5272 SIVmneE11S envelope glycoprotein 3D average obtained by cryo-electron tomography

5273 SIVmac239 envelope glycoprotein 3D average obtained by cryo-electron tomography

5274 SIV CP-MAC envelope glycoprotein 3D average obtained by cryo-electron tomography

Invited Oral Presentations

March 2015 “SmartScope Mobile Microscope Image Analysis App for Smart Devices” Central States Microscopy and Microanalysis Society – University of Missouri, Columbia, MO

November 2014 “Direct Electron Detector Regional Consortium” Central States Microscopy and Microanalysis Society – Missouri Science and Technology, Rolla, MO

February 2014 “High Resolution 3D Electron Microscopy” Stowers Institute for Medical Research, Kansas City, MO

November 2013 “3D Electron Microscopy” Presentation & Organizer, Central States Microscopy and Microanalysis Society, Washington University, St. Louis, MO

October 2012 “Protein Structure Determination with Cryo-Electron Tomography and Sub-volume Classification & Averaging” Central States Microscopy and Microanalysis Society, Missouri Science and Technology, Rolla MO

June 2011 “Quaternary structure of HIV/SIV Envelope glycoproteins determined by cryo-electron microscopy” University of Indiana, Bloomington, IN

December 2010 “Molecular architectures of trimeric HIV-1 and SIV envelope glycoproteins on intact viruses: Strain-dependent variation in quaternary structure” Rocky Mountain Labs, NIAID/NIH, Research Technologies Branch Seminar Series, Hamilton, MT

April 2007 “Mechanism-based Inactivation of Flavoenzymes” University of Central Missouri Biology & Earth Science Seminar Series, Warrensburg, MO

July 2006 “First Structure of a Monofunctional Proline Dehydrogenase Involved in Reactive Oxygen Species Generation” American Crystallographic Association National Meeting, Honolulu, HI

September 2005 "Who was Barbara McClintock?" Griffiths Leadership Society for Women, Columbia, MO

Meetings and Poster Presentations

- November 2016 "Zwitterionic-Containing Triblock Peptide Amphiphiles Self-Assemble into Unique Higher-Order Micellar Structures" Poster Presentation, Co-Author, American Institute of Chemical Engineers Annual Meeting, San Francisco, CA
- February 2016 Micro Electron Diffraction Workshop, Janelia Farms, Ashburn Virginia
- February 2016 Participant, Focused Ion Beam User Group Meeting, Johns Hopkins, Applied Physics Lab, Laurel, MD
- August 2015 Participant, Microscopy and Microanalysis 2015, Portland, Oregon
- April 2015 "Electron Microscopy for Life Sciences" & "Electron Microscopy Material Science" Poster Presentations, Life Sciences Week, University of Missouri, Columbia, MO
- April 2014 Participant, Electron Crystallography School, Darmstadt, Germany
- May 2014 "Looking back to move forward" Organizer, Central States Microscopy and Microanalysis Society, MRI Global, Kansas City, MO
- September 2013 "High Resolution TEM" Poster Presentation, Research Core Facility Day, University of Missouri, Columbia, MO
- August 2013 Participant, Microscopy and Microanalysis 2013, Indianapolis IN
- April 2013 "Applications of High Resolution TEM to Life Sciences" Poster Presentation, Life Sciences Week, University of Missouri, Columbia, MO
- March 2013 "Hyperspectral Imaging" Organizer, MAS Past President John Henry Scott, Central States Microscopy and Microanalysis Society, University of Missouri, Columbia, MO
- October 2012 Organizer, Research Core Facility Day, University of Missouri, Columbia, MO
- October 2012 "3D, Seeing Inside the Box" Organizer, MSA Tour Speaker Kent McDonald, Central States Microscopy and Microanalysis Society, Missouri Science and Technology, Rolla MO
- August 2012 Participant, Microscopy and Microanalysis 2102, Phoenix AZ
- April 2012 "High Resolution Electron Microscopy" Poster Presentation, Veterans Affairs Research Poster Day, VA Hospital, Columbia, MO
- April 2012 "High Resolution Electron Microscopy" Poster Presentation, Life Sciences Week, University of Missouri, Columbia, MO
- March 2012 Participant, "Transmission Electron Microscopy" Hooke College, Westmont, IL
- February 2012 Participant, Focused Ion Beam User Group Meeting, Carnegie Institute of Science, Washington D.C.
- October 2011 Participant, Research Core Facilities Day, University of Missouri, Columbia, MO
- October 2011 "Structural Mechanism of CD4-independent HIV infection" Poster Presentation, NIH Research Festival, Bethesda, MD
- August 2011 Participant, Microscopy and Microanalysis Meeting, Nashville, TN
- March 2011 Participant AIDS-related Structural Biology Meeting, National Institute of General Medical Sciences, Bethesda, MD

- February 2011 "Molecular Architectures of SIV Envelope Glycoprotein Trimers" Poster Presentation and Organizer, Chesapeake Society for Microscopy, George Washington University, Washington D.C.
- August 2010 "Molecular Architectures of SIV Envelope Glycoprotein Trimers" Poster Presentation, Microscopy and Microanalysis Meeting, Portland, OR
- October 2009 "Molecular Architectures of HIV-1 and SIV Envelope Glycoprotein Trimers" Poster Presentation, NIH Research Festival, Bethesda, MD
- December 2008 Participant, NCMI Workshop on Single Particle Reconstruction Map Interpretation and Visualization – Baylor College of Medicine, Houston TX
- March 2008 Participant, Keystone Symposium, HIV Pathogenesis and Vaccine Design, Banff, Canada
- September 2007 Participant, Nanoprobes Gold Labeling Workshop, Brookhaven, New York
- April 2006 "Characterization and Structure Determination of *Thermus thermophilus* Proline Dehydrogenase" – Poster Presentation University of Missouri's Life Sciences Week, Columbia, MO
- October 2005 Participant, Center for Emerging Technologies Midwest Trends in Biosciences, St. Louis, MO
- October 2005 Midwest Enzyme Chemistry Conference, Chicago, IL – Poster Presentation
"Characterization and Structure Determination of *Thermus thermophilus* Proline Dehydrogenase"
- October 2005 Participant, Midwest Regional Centers of Excellence, St. Louis, MO
- May 2005 "Characterization and Preliminary Crystallographic Determination of *Thermus thermophilus* Proline Dehydrogenase" Poster Presentation, American Crystallographic Association National Meeting, Orlando, FL
- April 2005 "Consequences of the Schizophrenia-associated L441P Missense Mutation of Proline Dehydrogenase Kinetics and Stability" Poster Presentation, University of Missouri's Life Sciences Week, Columbia, MO
- October 2004 "Consequences of the Schizophrenia-associated L441P Missense Mutation of Proline Dehydrogenase Kinetics and Stability" Poster Presentation, Proline Symposium, Frederick, MD