

Jason C. Baker, Ph.D.

Department of Biology
Missouri Western State University
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Education

Doctor of Philosophy, Biochemistry, January 1999

Department of Biochemistry, Kansas State University, Manhattan, KS

Dissertation title: Expression, Purification, and Characterization of Three Isoforms of Human Pyruvate Dehydrogenase Kinase

Bachelor of Science, Biochemistry, May 1993

Department of Biochemistry, Kansas State University, Manhattan, KS

Professional Experience

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| ◆ Professor of Biology
Missouri Western State University, St. Joseph, MO | Fall 2010-present |
| ◆ Visiting Scientist (summer faculty industry externship)
Becker Underwood, Inc., St. Joseph, MO | June/July
2011 |
| ◆ Associate Professor of Biology
Missouri Western State University, St. Joseph, MO | Fall 2005-2010 |
| ◆ Assistant Professor of Biology
Missouri Western State College, St. Joseph, MO | Fall 2000-
2005 |
| ◆ Guest Lecturer
University of Nebraska College of Dentistry, Lincoln, NE
Biochemistry course: Lecture topics- enzyme kinetics, mechanisms, and control; glycolysis | Fall 1999 |
| ◆ Postdoctoral Research Fellow
University Nebraska Medical Center, Eppley Cancer Institute, Omaha, NE | 1999-2000 |
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Awarded Fellowships and Grants

- Ducey, M. (Co-Principal), Baker, J. (Co-Principal), Yang, G. (Co-Principal), Becker, D. (Co-Principal), Wang, T. (Principal), "Midwest Apex Project," Sponsored by National Science Foundation, Federal, \$599,600.00. (April 1, 2010 - March 31, 2015)
- National Cancer Institute of the National Institutes of Health (R15 CA096723)
Todd T. Eckdahl, Jason C. Baker, Benjamin D. Caldwell, Missouri Western State University
"Antitumor Drugs that Bind the DNA Minor Groove", \$136,000. (2003- 2006)
- Department of Defense Breast Cancer Research Program Postdoctoral Traineeship (proposal # BC990250), \$143,000 "The Role of KSR-Associated Kinases in Breast Cancer Signaling"
Eppley Cancer Institute, University of Nebraska Medical Center (2000)

(3 year grant transferred to new post-doc researcher upon leaving UNMC for position with MWSU)

- National Cancer Institute Training Grant (5 T32 CA09476-11)
Postdoctoral Fellowship, Eppley Cancer Institute, University of Nebraska Medical Center
(1999-2000)

Submitted Grants

- ◆ National Cancer Institute of the National Institutes of Health 2005, 2007
Todd T. Eckdahl, Jason C. Baker, Melissa Daggett, Missouri Western State University
“Antitumor Drugs that Bind the DNA Minor Groove”
- ◆ National Science Foundation, Scholarship in STEM program 2007
Deborah Becker, Jason Baker, Michael Ducey, Jennifer Hageman, Missouri Western State University
“Midwest Information Technology and Science Scholarship Program”
- ◆ National Science Foundation, Scholarship in STEM program 2009
Deborah Becker, Jason Baker, Michael Ducey, Jennifer Hageman, Missouri Western State University
“Midwest Information Technology and Science Scholarship Program”

Professional Memberships

Missouri Academic of Sciences, 2001- present (lifetime member)

American Society for Microbiology, 2001 - present

National Association of Advisors for Health Professions, 2000- present

Genome Consortium for Active Teaching, 2002 – 2005

Association of College and University Biology Educators, 2008 - 2010

Awards

- ◆ Missouri Western Board of Governors Distinguished Professor Award (service) 2009
- ◆ Missouri Western Jesse Lee Myers Excellence in Teaching Award 2005
- ◆ Missouri Western Board of Governors Distinguished Professor Award (teaching) 2005
- ◆ Merck Outstanding Graduate Student Research Award 1998
Department of Biochemistry, Kansas State University
- ◆ Merck Outstanding Graduate Student Teaching Award 1996
Department of Biochemistry, Kansas State University

Peer-Reviewed Publications

Susan Brock, Judith Knadler, Tabitha Ritter and **Jason C. Baker**. Characterization of a Bacteriocin from *Bacillus amyloliquefaciens*. *Int. J. Curr. Microbiol. App. Sci.* 2018, 7(6): 1492-1503

Jason C. Baker, Raffensperger, M., Hardwick, C. What Students Expect From Their Health Professions Advisor. *The Advisor*, 2011, 31(1): 14-20

Judith Knadler, David Ashley, **Jason Baker**. A Selective Survey of Microbial Flora in the Water of Seven Missouri Caves. *Transactions of the Missouri Academy*, 2010, 43: 1-7

Kristen Walton, **Jason Baker**. Group projects as a method of promoting student scientific communication and collaboration in a public health microbiology course. *Bioscene*, 2009, 35(2): 16-22

Jason C. Baker, Paula Overfelt. Health Professions Advisors and AHECs: A Partnership That Benefits All. *The Advisor*. 2007, 27(3): 39-42

Jason C. Baker, Richard E. Crumley, and Todd T. Eckdahl. Random Amplified Polymorphic DNA PCR in the Microbiology Teaching Laboratory: Identification of Bacterial Unknowns. *Biochemistry and Molecular Biology Education*. 2002, 30: 394-397

Roche TE, **Baker JC**, Yan X, Hiromasa Y, Gong X, Peng T, Dong J, Turkan A, Kasten SA. Distinct regulatory properties of pyruvate dehydrogenase kinase and phosphatase isoforms. *Prog Nucleic Acid Res Mol Biol*. 2001;70:33-75. Review.

Liu S, Gong X, Yan X, Peng T, **Baker JC**, Li L, Robben PM, Ravindran S, Andersson LA, Cole AB, Roche TE. Reaction mechanism for mammalian pyruvate dehydrogenase using natural lipoyl domain substrates. *Arch Biochem Biophys*. 2001 Feb 15;386(2):123-35.

Baker JC, Yan X, Peng T, Kasten S, Roche TE. Marked differences between two isoforms of human pyruvate dehydrogenase kinase. *J Biol Chem*. 2000 May 26;275(21):15773-81.

Thomas E. Roche, Shengjiang Liu, Sundari Ravindran, **Jason C. Baker**, Lijuan Wang (1996) Role of the E2 core in the dominant mechanism of regulatory control of mammalian pyruvate dehydrogenase complex. Birkhäuser Verlag Basel/Switzerland, *Alpha-Keto Acid Dehydrogenase Complexes*, M. S. Patel, T. E. Roche, R. A. Harris (eds)

Shengjiang Liu, **Jason C. Baker**, P. C. Andrews, Thomas E. Roche (1995) Recombinant Expression and Evaluation of the Lipoyl Domains of the Dihydrolipoyl Acetyltransferase Component of the Human Pyruvate Dehydrogenase Complex. *Arch. Bioch. Biophys*. **316**, 926-940

Shengjiang Liu, **Jason C. Baker**, Thomas E. Roche (1995) Binding of the Pyruvate Dehydrogenase Kinase to Recombinant Constructs Containing the Inner Lipoyl Domain of the Dihydrolipoyl Acetyltransferase Component. *J. Biol. Chem*. **270**, 793-800

Peer-reviewed Presentations

Baker, J., "Math of Microbiology: an Approach to Increase Math Skills in Undergraduate Science Majors", American Society for Microbiology Conference for Undergraduate Educators, Denver, CO, July, 2017

Baker, J., Association of College and University Biology Educators annual meeting, "Math of Microbiology: an approach to increase math skills in undergraduate science majors", Association of College and University Biology Educators, St. Joseph, MO., October, 2015

Baker, J., Dysart, K., Ramey, M., Missouri Academy of Science annual meeting, "REAL-TIME PCR TO EVALUATE BRADYRHIZOBIUM JAPONICUM LEVELS IN AN ACTIVE SOYBEAN FIELD," Missouri Academy of Science, St. Joseph, MO., April, 2015

Baker, J., Walton, K., "Perspectives in Microbiology: Using Video-Based Assignments to Enhance Students' Historical and Global Understanding of Infectious Diseases", American Society for Microbiology Conference for Undergraduate Educators, San Mateo, CA., June, 2012

Baker, J., Pasch, E., "An Industrial Applied Research Internship: An undergraduate Conducting Research, Generating Data, and Getting a Job," American Society for Microbiology Missouri Valley Branch meeting, Lincoln, NE., April, 2011

Baker, J., Brock, S. R., Brown, T., Knadler, J., Triplet, M., "Characterization of Bacocin, a Novel Bacteriocin," American Society for Microbiology Missouri Valley Branch meeting, Lincoln, NE., April, 2011

Jason C. Baker. "An Effective, Low-Cost Investigative Fungal Laboratory for Allied Health Microbiology Students" presented at American Society for Microbiology Conference for Undergraduate Educators, May 2009, Colorado State University, Fort Collins, CO

Jason C. Baker, Kristen L.W. Walton. "A Successful Lab Project that Increases Bioinformatics Competency and Skills in Undergraduates" presented at Missouri Academy of Science, April 2009, Northwest Missouri State Univ.

Jason C. Baker . "Isolation, Identification, and Mode-of-Action Characterization of Bacocin, A Novel Bacteriocin Discovered at Missouri Western" presented to the Psi Xi Chapter of Tri-Beta Biological Honors Society, Nov. 2008

Jason C. Baker "Functional and Molecular Characterization of a New Bacteriocin" presented at Missouri Academy of Science, April 2007, MWSU

J. Rushin, **J. Baker**, D. Boutwell, C. Chevalier, M. Daggett, T. Eckdahl, S. Seeger, K. Walton "Using two-week learning cycle blocks (LCBs) as a way for non-major general biology students to do science in the lab." National Association of Biology Teachers, 2007

Jason Baker, David Ashley. "One-Day Infectious Disease Workshop" developed for the Northwest Missouri Area Health Education Center, presented January 2007

Baker, J., Caldwell, B., Daggett, M., Eckdahl, T. "Faculty working together to conduct undergraduate research" presented at the Conference on Applied Learning in Higher Education, MWSU, 2006

Jason C. Baker "DYOE (Design Your Own Experiment): A Model for One-Week Independent Laboratory Projects in a Microbiology Course" presented at American Society for Microbiology Conference on Undergraduate Education, New Orleans, LA, May 21-23, 2004

Jason C. Baker "Regulation of Pyruvate Dehydrogenase: A Possible Treatment for Type II Diabetes" presented at Tri-Beta Northcentral-2 District Convention, April 12-13, 2003

Baker, J.C., Eckdahl, T.T., Crumley, R.E. "RAPD PCR in the Microbiology Lab: a Molecular Approach to Identification of Bacterial Unknowns" presented at the Missouri Academy of Sciences, April 2002, Springfield, MO and American Society for Microbiology Education Conference, May 2002, Salt Lake City, UT

Selected Presentations with Students

Kiley Warriner and Jason C. Baker, "Primer Development and Real-Time PCR to Evaluate Inter-Strain Competition of *Bradyrhizobium japonicum* Strains in Balanced Media", PORTAL Showcase, MWSU, 2017

Jeffrey Claycomb, and Jason C. Baker, "Real-Time PCR to Evaluate Inter-Strain Competition of *Bradyrhizobium japonicum* Strains in Liquid Media Culture", PORTAL Showcase, MWSU, 2016

Alejandra Núñez Torres and Jason C. Baker, "Discovery of Antimicrobial Activity from Marine Bacteria", PORTAL Showcase, MWSU, 2015

John Sowards and Jason C. Baker, "Application Studies of Bacocin, a Novel Bacteriocin", PORTAL Showcase, MWSU, 2014

Kayla Dysart and Jason C. Baker, "Real-Time PCR to Monitor Bradyrhizobium japonicum Levels in an Active Soybean field", PORTAL Showcase, MWSU, 2014

Alyssa B. Jarrett, Tabitha L. Snider, and Jason C. Baker, "Isolation and Characterization of Bacocin, a Novel Bacteriocin", PORTAL Showcase, MWSU, 2012

Baker, J., Boan, D., Parrott, H., "Characterization of Bacocin, a Novel Bacteriocin," American Society for Microbiology Missouri Branch Meeting, St. Joseph, MO., March 30, 2012

Brock, S.R., J. Knadler, M. Triplett, T. Brown, and J.C. Baker. "Characterization, Isolation, and Identification of Bacocin, a Novel Bacteriocin" presented at Missouri Academy of Science, April 2009, Northwest Missouri State University (First place award winner for best research presentation)

Kristin Fee, Jason Baker. "Understanding Phenotype Variation and Gene Transfer through Prodigiosin Production in *Serratia marcescens*" presented at URSI symposium, MWSU, December 2008

Susan Brock, Travis Brown, Jason Baker. "Isolation, Identification, and Mode-of-Action Characterization of Bacocin, A Novel Bacteriocin Discovered at Missouri Western" presented at Summer Research Institute symposium, July 2008

Susan Brock, Judith Knadler, Meredith Triplet, Jason Baker. "Functional and molecular characterization of a new bacteriocin" presented at American Society For Biochemistry and Molecular Biology annual meeting, San Diego, April 2008 and Summer Research Institute symposium, MWSU, July 2007

Judith W. Knadler and Jason C. Baker, Ph.D "Characterization of a Newly Discovered Bacteriocin" presented at the URSI symposium, MWSU, Oct. 2006

Knadler, J., Ashley, D., Baker, J. "2006 Status Report on Microbes Identified from Missouri Cave Waters" presented at Missouri Academy of Sciences, Truman State University, April 2006

Willie Gilbert and Jason C. Baker. "The effectiveness of newly developed hand soaps at killing common bacteria" presented at Tri-Beta District Convention, Lyons, KS, April 2006

Benefield, Amanda, Baker, Jason C. "Antimicrobial Effectiveness of Laundry Detergents." presented at Multidisciplinary Research Day, May 2005, Missouri Western State College and Tri-Beta District Convention, Reis Biological Field Station, Steelville, MO, April 2005

Brianna Peterson, Jason C. Baker "DNA Microarray Analysis of Anti-tumor Drugs on Human Breast Cancer" presented at Missouri Academy of Sciences, April 17, 2004, Rockhurst University, Kansas City, MO

Knadler, Judy, David C. Ashley and Jason C. Baker. 2004. "Results from preliminary attempts to monitor microbes in cave water samples" presented at Missouri Academy of Sciences, April 17, 2004, Rockhurst University, Kansas City, MO

Barkman, Katie; Bundy, Kendra (Faculty Collaborators: Baker, J.C.; Ashley, D.C.) "Evaluation of Commercially Available Canine Parasite Diagnosis Products for Use in the Laboratory Component of a Medical Parasitology Course" presented at Multidisciplinary Research Day, December 2003, Missouri Western State College

Brianna Peterson, Jason C. Baker "DNA microarray Analysis of the Effects of Anti-Tumor Drugs on Human Breast Cancer" presented at Undergraduate Research Summer Institute Symposium, October 28, 2003, Missouri Western State College

Laurie Glasgow, Benjamin Caldwell, Jason C. Baker "Investigations of the Effects of NSAIDs on Antibiotic Susceptibility in Staphylococcus aureus" presented at 221st National Meeting of the American Chemical Society, April, 2001, San Diego, CA

Research and Projects in Progress

“Using real-time PCR to evaluate *in vitro* growth competition between *Bradyrhizobium japonicum* strains”

“Evaluation of Marine Microbes for Antimicrobial Activity.” Growth, assay development, antimicrobial activity screening, inhibitory spectrum, stability, and identification of potentially novel antimicrobial compounds.

"Real-time PCR for evaluation of soil Rhizobium levels in an active soybean field"

Real-time PCR offers a quantitative method for quickly evaluating the levels of soybean-nodulating strains of Rhizobium to understand the need for soil supplementation of this bacterium.

Select Professional Service and Activities

- Master of Applied Science – Industrial Life Science program Director, Jan. 2014 - present
- Chair of the MWSU Faculty Senate *ad hoc* Graduate Studies Committee, Sept. 2005 – April 2007
- Professional service as reviewer for “Microbe Library” (2009 and 2012) and Immunology textbook reviewer for W.H. Freeman and Company Publishers (2012)
- Assistant to the department Chairperson for transfer equivalencies, scheduling and academic advising, 2006 – present
- Faculty Shepherd, Agenstein/Remington Building Project. (May 2010 – February 2013)
- MWSU Strategic Planning Opportunity Co-Chair and Steering Committee Member, 2007 – 2009
- Missouri Academy of Science annual meeting local arrangements committee (2006/2007) and American Society for Microbiology Missouri Branch Meeting local arrangements (2012)
- Participated in the Learning Communities Summer Institute 2003, Evergreen State College, Olympia, WA, June 24-29, 2003
- Participated and presented at American Society for Microbiology (ASM) Conference for Undergraduate Educators (2001, 2002, 2004, 2006, 2009, 2012, 2017), the society’s General Meeting (2008) as well as State/Regional meetings (2011 and 2012)
- Participated and presented at Missouri Academy of Sciences annual meetings (2001, 2002, 2004, 2007, 2009, 2015)
- Participated in the Central Association of Advisors for the Health Professions bi-annual meetings (2001, 2003, 2007, 2015) and National meetings in 2010, 2014, 2016, 2018
- Serve as a Health Professions Advisor including chair of the Health Professions Scholarship Committee and chair of the Medical School Admission Agreements Committee, 2000 - present
- Serve as Bench Science Internship Coordinator for Department of Biology, Missouri Western State University, 2001 - present
- Serve as Missouri Western State University Pre-Professional Club faculty advisor (2000-May 2005, August 2006-August 2014, December 2015-present)