John W. Keller August 2016

CURRICULUM VITAE

Education:

Post-Doctoral, 1976-79. University of Wisconsin-Madison, Department of Chemistry, with Marion H. O'Leary. Enzymology of dialklylglycine decarboxylase.

Ph.D. in Chemistry, 1976. University of Wisconsin-Madison. Thesis mentor: Charles Heidelberger of the McArdle Laboratory for Cancer Research. Thesis: "Solvolytic Reactions of Polycyclic Arene Oxides".

B.S. in Chemistry, 1968. The Ohio State University. Research mentor: Paul G. Gassman. Senior thesis: "Synthesis of Tricyclo[3.2.1.$0^{1,5}$]octane".

Professional Experience:

2012- Professor of Chemistry Emeritus
2008-2010 Univ of Alaska Fairbanks, Dept of Chemistry & Biochemistry, Chair
1991-2011, University of Alaska Fairbanks, Department of Chemistry, Professor
1986-91, University of Alaska Fairbanks, Department of Chemistry, Associate Professor
1979-86, University of Alaska Fairbanks, Department of Chemistry, Assistant Professor

Honors & Memberships:

CNSM Chemistry Teacher of the Year 2008
UAF Honors Program, Excellence in Teaching recognition 2005-2008
American Association for the Advancement of Science
American Chemical Society
Phi Beta Kappa, Ohio State University

Professional Service:

American Chemical Society, Northwest Regional Meeting 2016. Organized and Chaired the Computational Chemistry Symposium.
American Chemical Society, Northwest Regional Meeting 2016. Workshop presentation: Web Based Molecular Modeling.
Panel Member, NSF Program in Course, Curriculum, and Laboratory Improvement 2001-2008
Panel Member, NSF Program in Molecular Biosciences 1995-1997
American Chemical Society Councilor for Alaska 1992-1994
Ad hoc reviewer for journals *Journal of the American Chemical Society, Biochemistry, Analytical Biochemistry, Dirasat, Journal of Chromatography,Journal of Chemical Education, The Chemical*

Educator, and *Origins of Life*
Mail reviewer for the National Science Foundation Division of Molecular Biosciences
Organized and Chaired "Biochemistry and Molecular Biology in the Circumpolar Region", Arctic Division of AAAS (1990).
Organized and Chaired "Frontiers in Molecular Biology" Symposium at the 1987 meeting of the Arctic Division of AAAS.
Chaired session on "Conformation of Chitin and Chitosan" at the Second International Conference on Chitin and Chitosan, Sapporo, Japan, July 1982.

University Service:

Chair, Department of Chemistry and Biochemistry, University of Alaska Fairbanks, 2008-2010
Chair, Biology Graduate Programs Review Committee, May 2004
Chair and member, Chemistry Dept Tenure and Promotion Peer Review Committee, 1991-2011
Member and one-time Chair, Campus-wide Tenure and Promotion Committee, 1993-1997, 2001-2003, 2005-2007
Chair, Environmental/Analytical Chemistry Search Committee, 2001-2002
Member, Inorganic Chemistry Search Committee, 2000-2001
Member, Campus-Wide Post-Tenure Review Committee, 1998-1999.
Received a "Resolution of Appreciation" from the UAF Faculty Senate for effective work as the Chair of the UAF Campus-Wide Tenure and Promotion Committee. May 1997.
Member, College of Natural Science Sabbatical Leave Committee 1992-1995
Member, Intellectual Property Committee, 1992-1995
Chair, Biochemistry Search Committee, 1991-92
Chair, Molecular Biology Search Committee, 1990-91
Coordinator, Program in Biochemistry and Molecular Biology, 1990-91
New Faculty Orientation and Classroom Assessment Presentations, Faculty Development Office, 1991
UAF Representative to Workshop in Classroom Assessment, Univ California, Berkeley 1991
Engineers-In-Training Lecturer 1991-96
Faculty Grants Committee, Member, 1989-91
Author of the University of Alaska Fairbanks program proposal for an M.S./Ph.D. in Biochemistry and Molecular Biology 1991
Invited speaker in Fairbanks and Anchorage high school AP science classes
Biochemistry Search Committee, Member and Chair, 1986-8
Faculty Member, Graduate Program in Biochemistry & Molecular Biology, 1985-present.
Fairbanks Assembly, CNS Representative, Alternate, 1985-87.
Chancellor's Committee on Biochem and Molecular Biology, 1984-85.
UAF Behavioral Science Conference competition, Referee, 1981-83.
Conducted "Advanced Placement Day" Demonstrations and Tours.
"Serine Proteases" A series of lectures to WAMI Biochemistry class, 1981.
Organized informal campus-wide biochemistry seminars, 1980-89.

Courses Taught at the University of Alaska Fairbanks (1979-2003) (90 total) :

Title	*Catalogue Number*	*Semesters*
General Chemistry	105	18
General Chemistry	106	4
Beginnings in Biochemistry	121	3
Organic Chemistry	321	27
Organic Chemistry	322	24
Organic Chemistry Laboratory	324	27
Advanced Organic Chemistry	421	2
General Biochemistry	451	2
Chemistry Seminar	492 & 692	2
Chemistry Research	498 & 698	2
Biochemistry Laboratory	694	1
Physical Organic Chemistry	621	3
Enzymology and Bioorg Chem	621	8
Protein Structure and Function	654	5
Molecular Modeling	494/694/623	2

Graduate Students (Graduated):

Jeffrey Bickmeier MS 2004 *"Chemical Synthesis and Soil Metabolism of dialkylamino acids"*

Julie La Rocca-Brigham MS 2003 *"Mass Spectral Identification of Trifluoroalanine-Modified Dialkylglycine Decarboxylase"*

Honghong Sun Ph.D. 2000 "*Cloning and Characterization of a Hyperthermophilic LysR Protein*"

See-Tarn Woon Ph.D. 1998 *"Role of Hydrogen Bonds in Enzymatic Decarboxylation"*

Tim Brayman M.S. 1993, *Construction and Characterization of an Active Site Mutant of Pseudomonas cepacia Dialkylglycine Decarboxylase*

Cliff Rutt M.A. 1988

Tim Thomas M.A. 1987

Karl Baurick M.S. 1987 *Cloning and Expression of Pseudomonas cepacia Dialkylglycine Decarboxylase in E. coli*

JoNell Hamilton M.S. 1985, *Enzymatic Resolution of Trifluoromethyl Amino Acids*

Other Graduate Committees

Zachary Pickett	Chemistry (current)
Ashley Anderson	Chemistry 2010
Dave Fish	Civil Engineering 2008
Suraj Cheiran	Biochemistry 2008
Elizabeth Gustafson	Ph.D. Marine Biology 2007

Other Graduate Committees (continued)

Xiaoming Zhao	Biochemistry 2006
Andy Krohn	Biochemistry 2004
Wei Zhengyu	Biochemistry 1998
Jiang Zhu	Chemistry, 1996
Milan Findura	Mathematics (Interdisciplinary)
Richard Smith	Biochemistry, 1996
Sandip Vyas	Biochemistry, 1995
Jesse Owens (UAA)	Neurophysiology (Interdisciplinary) Ph.D., 1988
Charles Knight	Agronomy Ph.D., 1988

Other Instructional Accomplishments:

Created a new graduate/undergraduate course “Molecular Modeling” Spring 2004/2010
Compiled and Published "First Semester Organic Chemistry: Practice Exams With Keys" and "Second Semester Organic Chemistry: Practice Exams with Keys", many updated editions.
Developed new graduate courses in physical organic chemistry and enzymology
Developed a biochemistry laboratory course (Chemistry 694) that included ten original experiments.
Developed new chemistry laboratory experiments concerned with chemical kinetics, amino acid analysis, scientific writing for chemists, and a demonstration of computerized chemical data base searching.
Wrote and published instructional booklet, "Student’s Guide to Illustrating Organic Molecules", 1980.

Research Program:

Our research has explored topics in various chemistry disciplines from organic chemistry through molecular biology, and currently has strayed in computational chemistry. This approach perhaps was inherited from JK’s Ph.D. mentor, Charles Heidelberger, who obtained a Ph.D. in organic chemistry under Louis Fieser at Harvard. Following his appointment at McArdle Laboratory, he applied the tools of organic and biochemistry to investigate chemical carcinogenesis at the molecular and cellular levels. Scientists from all these disciplines worked on simultaneous projects in Heidelberger’s group at the U. Wisconsin-Madison.

The overall aim of the program at the University of Alaska Fairbanks was to apply an organic chemistry approach to the understanding of enzyme catalyzed reactions and to the molecular aspects of genetic control in prokaryotes. Much of the work in our lab was carried out in the context of the chemistry and biochemistry 2,2-dialkylglycine amino acids, a rather unusual and little-investigated family of amino acids. *Burkholderia* (*Pseudomonas) cepacia* 2,2-dialkylglycine decarboxylase (DGD) was studied using kinetic methods, structure determination (in collaboration with Profs. Michael Toney and Hans Jansonius), and genetic engineering techniques. Working with students Lilly Allen-Daley and Hong-Hong Sun we studied the structure and function of a LysR-type DNA binding protein, the DgdR repressor, which was cloned and expressed in *E. coli* in our lab. DNA binding by DgdR protein is regulated by certain dialkylglycine amino acids. We also synthesized and resolved the stereoisomers of several 2,2-dialkylglycine and fluorinated 2,2-dialkylglycine amino acids in order to further characterize the structure and function of these proteins.

Perry Frey and W.W. Cleland and others have emphasized the idea that low-barrier hydrogen bonds might play an important role in enzyme catalysis. The dialkylglycine decarboxylase does have a possible interation like this in the interaction of the substrate carboxylate with Q52. Work by See-Tarn Woon and Michael Toney and his students showed that Q52 is important for the decarboxylation half-reaction of the DGD reaction. To put our understanding of hydrogen bonds on a firmer footing, we have begun to use high level computational tools available at the Arctic Region Supercomputing Center to study various hydrogen-bonded systems containing carboxylic acids.

Undergraduate and High School Research Students & Projects, 2006-1980 (support: *NSF-REU, +NSF) Co-authors of papers or abstracts are underlined.

Sifat Chowdhury	West Valley High School student. Hydrogen bonding in formic acid-SO2 complexes
Bronwyn Harrod	UAF chemistry major freshman: Hydrogen bonding in formic acid-SO2 complexes
Carey Fristoe	High school student. Investigation of Lewis Acid Catalyzed Diels-Alder Reactions
Sarah Brown	West Valley High School student. Identification of soil bacteria by 16S rRNA gene sequencing
Megan Conley	Amplification and cloning of *Mycobacterium smegmatis dgd* genes
Julieanne Walton-Rantz	West Valley High School student. PCR Cloning of *Leuconostoc mesenteroides dgd* genes.
Scott Hummel	West Valley High School student. Amplification and sequencing of Agrobacterium tumifaciens *dgd* genes. For High School Science Symposium.
Adrienne Orr	Synthesis of Deuterated α-Trifluoromethylalanine and Its Use As a Mass Label in the Inhibition of Dialkylglycine Decarboxylase
Kari Hagen	Cloning and expression of a *Bacillus subtilis* LysR-type protein
Tammy Qualley	Cloning and expression of the *Archeoglobus fulgidii* LysR-type protein
Cassie Klapstein	Lathrop High School student. Synthesis of a new Aib analogue: α-Propargylalanine. For Alaska High School Science Symposium.
Brian Klapstein	Lathrop High School student. An Oxazalinone-Derived "Blue Enolate" for Amino Acid Synthesis. For High School Science Symposium
Derek Sands*	Search for thermostable *dgd* genes
Kristian Jaeger	Dynamic Equilibria in DgdR-DNA Binding
Alexey Leonov	Production and Characterization of Mutant Dialkylglycine Decarboxylase
Edward Moore	Synthesis of 4,4,4-trifluoro-2-amino-2-methylbutanoic acid
Kathryn Landes	DgdR-DNA Unkinking by Various Dialkylglycines
Laurel Crosby	An Active Site Gln-to-Glu Mutant of Dialkylglycine Decarboxylase
Marcia O'Brien*	Partial Purification of Over-Expressed DgdR Repressor
Renee Doney*	Characterization of DgdR Operator Mutants
Elizabeth Allen-Daley+	Characterization of the DgdR repressor
Xeuquing Wang+	DgdR Repressor Studies
Shawn Vogen*	Dialkylglycine Decarboxylase Purification
Susan Bray*	Redesigning *dgdR* Gene
Matthew Wise+	Overproduction of Dialkylglycine Decarboxylase
Rebecca A. Reynolds+	Construction of a Recombinant Plasmid Using PCR

Felix Vajdos*	Active Site Labeling of Dialkylglycine Decarboxylase
Raj Parehk*	Purification of Dialkylglycine Decarboxylase
Tim Nickles^{+}	Progress in PCR-Mediated Mutagenesis of dgdA gene
Sherri Trask	2-Methylalanine Biosynthesis in *Trichoderma viride*
Ken Dick	Synthesis and Properties of 2-Pentafluoroethylalanine
San Ping^{+}	Subcloning Analysis of 4.0-kb fragment of *P. cepacia* DNA
Lars Ebbesson*	Synthesis of R- and S-Isovaline
Nancy Sonafrank^{+}	Stereospecific Induction of Decarboxylase Gene Expression
Susan Harder	Evaluation of an Automated FIA Enzyme Analyzer
Mark Gosink	An IBM-BASIC Graphing Program
Eric Loomis	Gel Chromatography of Chitin Oligomers
Tim Gould	ASYST Language Laboratory Interface Program
Carl Benson	A Second Generation Flow Injection Enzyme Analyzer
Mary Lou Langham	A New Assay for *P. cepacia* Dialkylamino Acid Transaminase
Michael McCarthy	Kinetics of DAT Exchange Transamination
Kelly Drew	An Undergraduate Experiment in Gel Chromatography
James Moran	Purification of *P. cepacia* Dialkylamino Acid Transaminase
Mario Roederer	Synthesis of 1-Aminocyclobutane Carboxylic Acid Hydantoin
Robert Arnold	Partial Synthesis of 1-Aminocyclobutane Carboxylic Acid
Barbara Hoopes	Optimization of *P. cepacia* Growth conditions

Refereed Publications :

J. W. Keller, Sulfur Dioxide−Pyridine Dimer. FTIR and Theoretical Evidence for a Low-Symmetry Structure", *Journal of Physical Chemistry A,* **119**, 10390-10398 (2015). doi:10.1021/acs.jpca.5b06122.

J. W. Keller and Cindy E. Fabbri, "Headspace GC–MS Analysis of Halogenated Volatile Organic Compounds in Aqueous Samples: An Experiment for General Chemistry Laboratory", *Journal of Chemical Education,* **89**, 803-806 (2012). doi:10.1021/ed100901v

J. W. Keller, B. L. Harrod, and S. A. Chowdhury, "Theoretical Study of Formic Acid-Sulfur Dioxide Dimers", *Journal of Physical Chemistry A*, **114**, 13182-13188 (2010). doi:10.1021/jp1076214

J. W. Keller, "Using Curved Arrows for Retrosynthetic Analysis", *The Chemical Educator,* **15**, 331-333 (2010).

J. W. Keller, "Lewis Acid Catalyzed Diels-Alder Reaction of Carvone with Isoprene. Using Two-Dimensional NMR and Molecular Modeling to Solve a Stereo- and Regiochemical Puzzle", *The Chemical Educator,* **11**, 262-266 (2006).

K. D. Schnackerz, J. W. Keller, R. S Phillips, and M. D. Toney, "Ionization state of pyridoxal 5'-phosphate in D-serine dehydratase, dialkylglycine decarboxylase and tyrosine phenol-lyase and the influence of monovalent cations as inferred by ^{31}P NMR spectroscopy." *Biochimica et Biophysica Acta,* **1764**, 230-238 (2006).

E. J. Fogle, See-Tarn Woon, J. W. Keller, and M. D. Toney, "Role of Q52 in Catalysis of Decarboxylation and Transamination in Dialkylglycine Decarboxylase", *Biochemistry*, **44**, 16392-16404 (2005).

J. W. Keller, “The Formic Acid-Trifluoroacetic Acid Bimolecule. Gas-Phase Infrared Spectrum and Computational Studies”, *Journal of Physical Chemistry A*, 108, 4610-4618 (2004).

V. N. Malashkevich, P. Strop, J. W. Keller, J. N. Jansonius, and M. D. Toney, “Crystal Structures of Dialkylglycine Decarboxylase Inhibitor Complexes”, *Journal of Molecular Biology*, 294, 193-200 (1999).

M. D. Toney, E. Hohenester, J. W. Keller, J. N. Jansonius, “Structural and Mechanistic Analysis of Two Refined Crystal Structures of the Pyridoxal Phosphate-Dependent Enzyme Dialkylglycine Decarboxylase”, *Journal of Molecular Biology*, 245, 151-179 (1995).

E. Hohenester, J. W. Keller, and J. N. Jansonius, “An Alkali Metal Ion Size-Dependent Switch in the Active Site of Dialkylglycine Decarboxylase”, *Biochemistry* **33**, 13561-13570 (1994).

"*Pseudomonas cepacia* 2,2-Dialkylglycine Decarboxylase. High-Level Expression in Escherichia coli and Sequence Alignment with Ornithine Aminotransferases", J. W. Keller, R. A. Reynolds, M. K. Wise, and R. A. Parekh in *Enzymes Dependent on Pyridoxal Phosphate and Other Carbonyl Cofactors* (T. Fukui, H. Kagamyama, K. Soda, and H. Wada, eds), pp 95-97, Pergamon Press, Oxford (1991).

M. D. Toney, J. W. Keller, R. A. Paupit, J. Jaeger, M. K. Wise, U. Sauder, and J. N. Jansonius, "Crystallization and Preliminary X-ray Diffraction Studies of Dialkylglycine Decarboxylase. A Decarboxylating Transaminase", *Journal of Molecular Biology* **222**, 873-875, (1991).

J.W. Keller, M.K. Wise, and R.A. Reynolds, "Versatile Partial Purification of Glucose-6-Phosphate Dehydrogenase By Ion Exchange Chromatography," *Journal of Chemical Education* **68**, 265-266 (1990).

T.P. Clausen, J.W. Keller, and P.R. Reichardt, "Aglycone fragmentation accompanies β-glucosidase catalyzed hydrolysis of salicortin, a naturally-occurring phenol glycoside," *Tetrahedron Letters*, **31**, 4537-4538 (1990).

J.W. Keller, K.B. Baurick, G.C. Rutt, M.V. O'Malley, N.B. Sonafranck, R.A. Reynolds, L.O.E. Ebbesson, and F.F. Vajdos, "*Pseudomonas cepacia* 2,2-Dialkylglycine Decarboxylase. Cloning and Sequencing of Structural and Repressor Genes," *Journal of Biological Chemistry*, **265**, 5531-5539 (1990).

J.W. Keller and K. Niwa, "Milligram-scale separation of optical isomers of 2-pentafluoroethylalanine and 2-trifluoromethylalanine by medium performance reversed phase chromatography," *Journal of Chromatography*, **469**, 434-439 (1989).

J.W. Keller, T.S. Gould and K. Aubert, "The ASYST Language for the IBM-PC: Data Acquisition Features and an Application to Flow Injection Analysis," *Journal of Chemical Education*, **63**(8), 709-11 (1986).

J.W. Keller and K. O. Dick, "Resolution of underivatized polyfluoro-2,2-dialkylglycine enantiomers by reversed-phase chromatography," *Journal of Chromatography*, **367**, 187-90 (1986).

J.W. Keller and B. J. Hamilton, "Enzymatic Resolution of 2-Trifluoromethyl Alanine," *Tetrahedron Letters*, **27**(11), 1249-50 (1986).

J.W. Keller and C.S. Day, "Structure and Absolute Configuration of N-chloroacetyl-R(+)-3,3,3-trifluoro-2-aminoisobutyric acid, $C_6H_7O_3ClF_3N$." *Acta Crystallographica*, Section C, 1224-1226 (1984).

J.W. Keller, "Enzyme Assay by Repetitive Flow Injection Analysis. Application to the Assay of Hog Kidney Aminoacylase." *Analytical Letters, Part B, Clinical and Biochemical Analysis*, **17**(B7), 589-598 (1984).

J. Magnuson, J.W. Keller, A.L. Beckel, and G.W. Gallepp, "Breathing Gas Mixtures Different from Air: An Adaptation for Survival Under the Ice of a Facultative Air-Breathing Fish," *Science*, **220**, 312-314 (1983).

J. W. Keller and M. H. O'Leary, "3,3,3-Trifluoro-2-aminoisobutyrate: A Mechanism-Based Inhibitor of *Pseudomonas cepacia* Dialkylamino Acid Transaminase," *Biochemical and Biophysical Research Communications*, **98**(4), 1104-1110 (1979).

J. W. Keller, C. Heidelberger, F. R. Beland, and R. G. Harvey, "Hydrolysis of Syn- and Anti-Benzo[a]pyrene Diol Epoxides: Stereochemistry, Kinetics, and the Effect of an Intramolecular Hydrogen Bond on the Rate of Syn-Diol Epoxide Solvolysis," *Journal of the American Chemical Society*, **98**, 8276-77 (1976).

J. W. Keller and C, Heidelberger, "Polycyclic K-Region Arene Oxides: Products and Kinetics of Solvolysis," *Journal of the American Chemical Society*, **98**, 2328-36 (1976).

J. W. Keller, N. G. Kundu, and C. Heidelberger, "An Unusual Arene Oxide Reaction: Solvent Capture During Acid Catalyzed Solvolysis of 7,12-Dimethylbenz[a]anthracene 5,6-oxide," *Journal of Organic Chemistry*, **41**, 3485-86 (1976).

P.G. Gassman, A. Topp and J.W. Keller, "Tricyclo[3.2.l.$0^{1,5}$]octane--A Highly Strained 'Propellerane'", *Tetrahedron Letters*, 1093-95 (1969).

Patents:

J. W. Keller, "A Repressor Gene for Regulating Expression of Polypeptides and its Use in the Preparation of 2,2-Dialkylglycine Decarboxylase of *Pseudomonas cepacia*," 5,210,025. May 11, 1993.

J. W. Keller, " Repressor Protein and Operon for Regulating Expression of Polypeptides and its Use In the Preparation of 2,2-Dialkylglycine Decarboxylase of *Pseudomonas cepacia*. 5,356,796. Oct. 18, 1994.

Publication Not Refereed:

"Student's Guide to Illustrating Organic Molecules" A 50-page booklet published with a UAF Mellon grant which introduces novel instructional concepts such as natal conformations and connectivity maps to beginning organic chemistry students.

Abstracts, Posters, and Presentations:

Keller, John W. “Web-Based Molecular Modeling”, workshop at NORM2016, 71st Northwest Regional Meeting of the American Chemical Society, Anchorage, AK June 22-25, 2016.

Keller, John W. “SO_2-pyridine complex is unsymmetrical: Computational and spectroscopic probes of SO2-H_{ortho} interaction”, 245th ACS National Meeting & Exposition, New Orleans, LA, United States, 2013, COMP-.

Keller, John W. “Can a ring substituent sterically block a rotating ligand? Rotational dynamics and geometries of sulfur dioxide-substituted pyridine complexes”, 246th ACS National Meeting & Exposition, Indianapolis, IN, United States, September 8-12, 2013, PHYS-15487.

Keller, John W. and Green, Thomas J., “Molecular dynamics studies of anionic, chemically modified cyclodextrins,” 68th Northwest Regional Meeting of the American Chemical Society, Corvallis, OR, July 21 24 (2013).

Keller, John W. “Assessing the impact of a new general chemistry GC-MS laboratory experiment using a SALG online questionnaire and a supplemented California Chemistry Diagnostic Test”, 242nd ACS National Meeting & Exposition, Denver, CO, United States, August 28-September 1, 2011, CHED-77.

Harrod, B. L.; Chowdhury, S.; Keller, John W,. “Theoretical studies on SO_2-carboxylic acid dimers: Exploring substituent and solvation effects” 239th ACS National Meeting, San Francisco, CA, United States, March 21-25 (2010).

Carey R. Fristoe and John W. Keller “Syn-Exo Selective Lewis Acid Catalyzed Diels-Alder Reaction of Carvone with Cyclopentadiene” 64th Northwest Regional Meeting of the American Chemical Society, Tacoma, WA, June 28-July 1 (2009)

John W. Keller, Sifat Chowdhury, and Bronwyn L. Harrod, “SO_2-Formic Acid Dimers. Computational Study of Hydrogen Bond and Donor-Acceptor Interactions” 64th Northwest Regional Meeting of the American Chemical Society, Tacoma, WA, June 28-July 1 (2009)

B. L. Harrod and J. W. Keller “Computational and Spectroscopic Studies of SO2-Formic Acid Complexes”, 7th Mercury Conference on Undergraduate Computational Chemistry, Clinton, NY July 2007.

J. Bickmeier, T. S. Thompson, and J. W. Keller “Alaskan Soil Bacteria Utilizing Alpha-Aminoisobutyric Acid (2-Methylalanine) as a Sole Nitrogen Source: Identification by 16S rRNA Gene Sequencing” Annual meeting of the American Society for Microbiology, Salt Lake City, May 2002.

K. D. Schnackerz and J.W. Keller “Monovalent cation dependence of dialkylglycine decarboxylase and d-serine dehydratase as inferred by ^{31}P NMR spectroscopy.” Eleventh Enzyme Mechanisms Conference, 1999.

Honghong Sun and John W. Keller, “Molecular Cloning, Expression and Characterization of a LysR-type Protein From *Methanococcus jannaschii*” 1999 Annual Meeting of American Society for Biochemistry and Molecular Biology, San Francisco.

RobertW. Taylor, Isaiah Martinez, and John W. Keller, “Genetic Engineering as a Cooperative High School-University Research Project”, 1998 AAAS Annual meeting, Fairbanks, AK.

E. S. Allen-Daley, P.-Y. Chi, and J. W. Keller, "*In Vitro* and *In Vivo* Analysis of the *Burkholderia cepacia* Regulator DgdR. Interaction with the *DgdA* Promoter. 1998 Annual Meeting of American Society for Biochemistry and Molecular Biology, Washington D.C.

S.-T. Woon and J. W. Keller, "Wild-Type and Mutant 2,2-Dialkylglycine Decarboxylases. Role of Active Site Gln52 Investigated by Site Directed Mutagenesis. 1998 Annual Meeting of American Society for Biochemistry and Molecular Biology, Washington D.C.

John W. Keller, T.G. Brayman, and S.-T. Woon, "Genetic Engineering of *Pseudomonas cepacia* Dialkylglycine Decarboxylase." *BioFactors* **5**, 270-271 (1997).

"DgdR Repressor from *Pseudomonas cepacia*. Purification, Properties, and Modification of a putative Autoregulating Operator." E. Allen-Daley, M. L. O'Brien, R. L. Doney, and J. W. Keller, *FASEB J.* **8(**7), A1277 (1994).

"*Pseudomonas cepacia* 2,2-Dialkylglycine Decarboxylase. Active Site Mutations to Investigate Roles of Proton Transfer and Hydrogen Bonding.", J. W. Keller, T. Brayman, and L. Crosby. *FASEB J.* **8**(7), A1280 (1994).

"*Pseudomonas cepacia* DgdR, a New DNA Binding Protein in the LysR Family, Revised Sequence, Expression in *E. coli*, and Gel Shift Assay." J. W. Keller, E. Allen-Daley, and X. Wang, **6**(1), A356, *FASEB Journal* (1992).

"*Pseudomonas Cepacia* 2,2-Dialkylglycine Decarboxylase. Active site peptide sequence and homology with ornithine aminotransferase," J.W. Keller, R.R. Reynolds, and F.F. Vajdos, 1990 meeting of the American Society for Biochemistry and Molecular Biology, New Orleans.

"*Pseudomonas Cepacia* 2,2-Dialkylglycine Decarboxylase. Stereospecific Induction of Gene Expression From a Cloned Operon by S-Isovaline," J.W. Keller, N.B. Sonafrank, and L.O. Ebbesson, 1989 meeting of the American Society for Biochemistry and Molecular Biology, San Francisco.

"Cloning, Expression, and Nucleotide Sequence of *Pseudomonas cepacia* 2,2-Dialkylglycine Decarboxylase Structural and Regulatory Genes," 1988 Meeting of American Society for Biochemistry and Molecular Biology, Las Vegas.

"Do Trifluoromethyl Substituents on Enzyme Substrates and Inhibitors carry Water Molecules into Enzyme Active Sites?" J.W. Keller and B. JoNell Hamilton, Ninth Enzyme Mechanism Conference, Tarpon Springs, Florida, 1985.

"Stereospecific Inactivation of *Pseudomonas Cepacia* Dialkylamino Acid Transaminase by (+) and (-)-Trifluoromethylalanine." J.W. Keller, Eighth Enzyme Mechanisms Conference, Asilomar, CA, January, 1983.

"Enzymatic Resolution of Trifluoromethylalanine." J.W. Keller, 184th Meeting of the American Chemical Society, Kansas City, September, 1982.

"1-Aminocyclo[n]ane carboxylates: Ring Strain Effects in Decarboxylation Reactions Catalyzed by *Pseudomonas Cepacia* Dialkylamino Acid Transaminase." J.W. Keller, 1980 Annual Meeting of the American Society of Biological Chemists, New Orleans.

Invited Talks:

"Structure and Function of a Dialkylglycine-Inducible Transcriptional Activator", Biologics Process Development, Inc. Poway, CA March 2003.

"Structure and Function of a Dialkylglycine-Inducible Transcriptional Activator", Life Technologies, Inc., Rockville, MD July 2000

"Molecular Modeling in the Chemistry Curriculum". University of Alaska Anchorage, Feb. 2000.

"Structure and Function of Amino Acid Decarboxylases". University of Alaska Anchorage, Fall 1996.

"Genetic Engineering of *Pseudomonas cepacia* Dialkylglycine Decarboxylase" at the International Workshop on Biotechnology, Kyoto, Japan. 1996.

"Genetic Engineering Approach to the Production and Characterization of an Autoregulating Repressor", Invited Seminar, Univ of Alaska Anchorage, October, 1993. Also, Biochemistry and Molecular Biology Seminar, October, 1993.

"How a Bacterial Genetic Switch Works", Invited Seminar at the University of Alaska Anchorage, November 1991.

"Computer and Functional Analysis of a Cloned Decarboxylase Operon," Invited Seminar at University of Alaska Anchorage, April 1989.

"Computer and Functional Analysis of Cloned Decarboxylase Operon," Seminar at the Annual Meeting the Alaska Division of the American Society of Microbiology, April 1989.

"Functional and computer analysis of a putative dialkylglycine decarboxylase operon from Pseudomonas cepacia.", J.W. Keller, N.B. Sonafranck, L.O.E. Ebbesson, and R.A. Reynolds. Pseudomonas '89 Meeting of the American Society for Microbiology, Chicago, July 1989. Poster

"Sequence Analysis of a Gene Coding for Bacterial Decarboxylase," 1988 Meeting of the Arctic Division of the American Association for the Advancement of Science, Symposium on Biochemistry and Molecular Biology.

"A Recombinant DNA Approach to the Study of a *Pseudomonas cepacia* Decarboxylase Enzyme", 1987 Arctic Science conference, Anchorage, AK.

"Serendipitous Cloning of a Bacterial Decarboxylase Operon", Institute of Arctic Biology Seminar, 1987.

"Undergraduate Laboratory Computing Using ASYST, A User Friendly Data Acquisition and Analysis Software Package. Application to Flow Injection Analysis," J.W. Keller, T.F. Gould, and K.T. Aubert, 1985 Arctic Science Conference, Fairbanks, AK.

"Fluorinated Amino Acid Enzyme Inhibitors: Preparation of the Separate Stereoisomers of 2-Trifluoromethyl Alanine," B.J. Hamilton and J.W. Keller, 1985 Arctic Science Conference, Fairbanks, AK.

"Cloning of the *Pseudomonas Cepacia* 2,2-Dialkyl Glycine Decarboxylase in *Escherichia Coli*: Preliminary Results," K.B. Baurick and J.W. Keller, 1985 Arctic Science Conference, Fairbanks, AK.

"*Pseudomonas cepacia* Dialkylamino Acid Transaminase. Evolution of a Dual-function B-6 Enzyme from a Simple Precursor?" J.W. Keller, 1983 Meeting of the Alaska Division of the American Society for Microbiology, Fairbanks.

"Chitin Deacetylase from *Mucor Rouxii*. Partial Purification and Molecular Weight Determination by Gel Chromatography." M.W. Walter and J.W. Keller, 34th Alaska Science Conference, Whitehorse, Yukon Territories, September, 1983.

Funded Proposals

Funded Research Proposals, State and National ($1,019,495 total):

"Persistent Organic Pollutants in Alaska. New GC-MS Experiments and Experiences for College and Pre-College Students", PI. National Science Foundation, Div. Undergraduate Education, 2008-2010, $149,952.

"Increasing Breadth in the Separation Science Curriculum in Chemistry: Addition of HPLC and CE to Analytical, Organic, and Biochemistry Lab Instruction" co-PI , National Science Foundation, Div. Undergraduate Education, 2004-2005, $81,523.

"Enhancing Chemistry Curricula through Molecular Modeling: A Multi-Campus Consortium Approach," PI, National Science Foundation, Div. Undergraduate Education, 2001-2004, $176,000.

"Mechanism of Gene Regulation by a LysR Repressor", National Institutes of Health, Institute of General Medical Sciences Genetics Program, 1993-1995, $100,000.

"Workstation with Molecular Graphics Software", National Science Foundation, Division of Molecular Biosciences, 1993-94, $18,000 (plus $9000 match from UAF).

"Prosthetic Decarboxylase Catalysts." National Science Foundation, Division of Molecular Biosciences, 1990-92, $170,000

"Decarboxylase Structure-Function Relationships." National Science Foundation, Division of Molecular Biosciences, 1987-90, $137,100.

"Biotechnology of Shellfish Waste Processing." J.W. Keller and E.J. Brown, Alaska Sea Grant Program, 1982-1984, $175,000.

"The R and S Forms of 3,3,3-Trifluoroaminoisobutyrate: Potential Stereospecific Mechanism-Based Enzyme Inhibitors." Research Corporation, 1979-1982, $10,000.

UAF-Funded Research Proposals ($102,845 total):

Technology Advisory Board. Several ~$60,000 total

Mining the Soil Metagenome for Functional Transcription Factor Variants, University of Alaska EPSCoR Program Genome Diversity Focus Area 2001-2002, $6000.

Mapco Equipment Funds 1995

"Computer Display for Large Chemistry and Physics Classrooms, $10,000

University of Alaska President's Fund, "Purchase of a Thermal Cycler", $3100, 1989

Vice-Chancellor for Research and Advanced Study

"Laboratory Assistant Salary for continuing research on Chitin Deacetylase," $2500, 1985.

"X-ray Study of N-Chloroacetyl-3,3,3-trifluoro-2-aminoisobutyric Acid," $1400, 1982.

"Capillary GC Column for Chromatographic Separation of AA Enantiomers", $800, 1983.

University of Alaska Fairbanks Faculty Grants Committee

"Enantioselective Hydrolysis of Fluoroalkyl Amino Acids by Hog Aminoacylase," $5500, 1984.

"Cloning and Expression of *P. cepacia* Dialkylamino Acid Transaminase," $5645, 1986.

"Sequence of a *P. cepacia* Gene Coding for 2,2-Dialkylglycine Decarboxylase", $6900, 1987.