

Joseph Provost, Ph.D

Dept of Chemistry and Biochemistry, University of San Diego

5998 Alcalá Park, San Diego, CA 92110

josephprovost@sandiego.edu, (619) 260-4513

Education:

2013 – Present University of San Diego: Professor, Chemistry and Biochemistry
2011 - 2013 Minnesota State University Moorhead: Dept of Chemistry and Biochemistry
2011 – 2012 North Dakota State University: Senior Member Center for Biopharm Research & Production
1997 – 2011 Minnesota State University Moorhead: Dept of Chemistry & Dept Biological Sciences
1994 - 1997 Howard Hughes Medical Inst. Dept. Molecular Physiology Vanderbilt University: Postdoc
1988 - 1994 Department of Biochemistry and Molecular Biology University of North Dakota Medical School: Ph.D. Biochemistry and Molecular Biology
1983- 1988 Bemidji State University: B. S. – Chemistry Minor – Biology and Military Science

Professional Experience:

2016 – Present American Chemical Society Committee on Professional Training (CPT)
2008 - 2017 CUR Councilor – Chemistry Division
2003 – Present ASBMB Education & Membership Committee,
2006 – 2009 Chair ASBMB UAN (undergrad student chapters) Committee – Past chair 2010
2005 – 2014 Editorial Advisory Board – Chemical Biology and Drug Design
2004 – Present Associate Editor – Biochemistry and Molecular Biology Education
2009 – 2013 Editorial Board, The Minnesota Academy of Science Journal
2006 –2013 Chair MSUM Biochemistry & Biotechnology Program (On leave 2011-12)
2005 – 2009 BWP Ltd. Biotechnology Management - Scientific Advisor
2003 – 2006 Minnesota Academy of Science Board of Directors
2001 – 2012 DragonTech Biotech LLC CEO & Polar Biotech Solutions LLC COO
1997 – 2013 Radiation Safety Officer – MSUM
1983 - 2002 US ARMY, MN National Guard. Military Police, Infantry & Chemical Corps: Platoon Leader, Company Commander, Battalion Staff Officer, Last rank – Captain (Ret)

Research Students Trained: 210 Undergraduate, High School students & HS teachers trained.

Honors / Experiences

- USD Outstanding Undergraduate Research Mentor Award 2017
- USD Associated Student Professor of the Month Spring 2016
- Program and Departmental External Reviewer Seven Universities/Colleges
- Welcome and orientation for all undergraduates at Annual ASBMB meeting 2005-2019
- Co-Lead Undergraduate Poster Competition ASBMB 2004-2011
- Accreditation and Standardized Exam Committee ASBMB 2010-2016
- Mentor/leader for PKAL leadership Institute (summers 2015 & 2017)
- Chaired sessions for ASBMB 2015-2011, 2004 Annual Meetings
- Leadership and member of team which created Vaccinology Minor at NDSU
- Business Development for Contract Research Organizations in Biotechnology & Biopharmaceuticals
- Building Committee – Faculty Representative MSUM Science Lab and Hagen Hall Renewal (five year commitment, involved in all phases from planning to occupying new space)
- Member of ASBMB Accreditation and Standardized Exam Committee
- Seventeen time review panel member – NSF Molec Cell Bio and Structural Bio & TUES
- Written GRE Subject Test Questions – Biochemistry, Cell Biology and Molecular Biology
- American Chemical Society, Red River Valley Section, Executive Board – 1999 -2001
- MnSCU Award for Excellence in Curriculum Programming – Biotech Oversight Group 2003
- Academic Affairs Excellent Award for Student Service –Biotech. Oversight Group MSUM 2001
- Academic Affairs Excellence Award for Research - MSU Moorhead 2000
- PKAL Faculty for the 21st Century (F21) 1999
- Music Scholarship 1983 Bemidji State University
- Coached 28 boys and girls hockey teams from ages 6 -college Club Hockey, Fargo Board of Directors 6 yrs, ND-USA Hockey Selects Coach, Founded Adult Novice league in Fargo, ND (over 150 participants).

Courses Taught:

Biochemistry I & II	Biotechniques I & II	Biotechnology Seminar
Biochemistry Laboratory I & II	Medical Observations I & II	Health Profession Chemistry Lab
Basic Principles of Chemistry	Molecular Techniques	Chemistry in Everyday Life
Health Professional Chemistry	Science of Cooking	Organic Chemistry Laboratory I
General Chemistry Laboratory	Biochemistry of Cancer	Human Physiology Laboratory
Undergraduate Research	Research Experience in Vaccinology	Methods in Research

Scientific Interests/Expertise: Proteomics, protein structure, signal transduction, enzymology, membrane ion channels, purification of membrane and cytosolic proteins, vaccine development, protein interactions / regulation, G-proteins and protein kinase/phosphatases, ELISA, immunoprecipitation, immunokinase assays, polyclonal antibody production, animal handling and organ removal. Molecular biology techniques in cloning, sequencing, subcloning rt/Q PCR, mutation, shRNA and RNAi, fluorescence and confocal microscopy.

Academic Interests/Experience: Pedagogy of engagement, creating, building and sustaining STEM programs, assessment of teaching and research, industry & entrepreneurship and academic partnerships, workforce training, integrating research into undergraduate curriculum, academic leadership.

Grants – \$ 3,209,166 awarded

- 2017 – NSF DUE IUSE II 1726932 Design and Development. MDH CUREs Community – a protein centric Approach. With JE Bell and JK Bell. \$598,666
- 2014 – NSF MCB \$15,750 Efforts to support underserved students and faculty at national science meetings
- 2011 – NSF MCB 1130367 Supporting the Research of PUI Faculty and Undergrads at the ASBMB. \$63,375
- 2009 – Minnesota Department of Employment and Economic Development– Infrastructure Grant - \$ 710,000
- 2009 – NSF RET Supplement for High School Teacher/Student Research – \$48,500
- 2008 – NIH R15-CA-135616-01 AREA – Mechanism of NHE and MMP9 in tumor invasion \$186,364
- 2008 – NSF RUI MCB-0817784 – Phosphorylation of NHE by RhoA Kinase \$369,275
- 2007 – MSUM Instructional Improvement Grants Analytical Chemistry Upgrade \$ 7,422
- 2006 – NSF MCB Request to Support ASBMB efforts for Undergrad Research Ed. \$67,500.
- 2006 – NIH Undergraduate Research Supplement \$18,816
- 2005 – NSF CCLI A&I Enhancing Student Learning by the Integration of Research-based \$ 171,130.
- 2004 – Anheiser Bush Award for MSUM Science Culture and Microscopy Facilities. \$30,000.
- 2004 – NIH R15, Mark Wallert and Joe Provost. Regulation of NHE and MAPK Requires PLD. \$197,500.
- 2002 – NSF RUI RET. Mark Wallert and Joe Provost Involving High School Students in Research. \$10,000.
- 2001 - NSF MRI - Optical Imaging Fluorescence Microscopy enhancement \$116,163
- 2001 – NSF CCLI MSU Biotechnology: Integrating Research into Education \$154,790
- 2000 – MSUM Strategic Goals Initiative - From Outreach to Recruiting - Sciences at MSU - \$62,000
- 2000 – NSF RUI Grant; Regulation of MAP Kinase and NHE1 by the G proteins Gq and G13 -\$156,341

Selected Publications (37 total): Underlined- undergrad

1. Hovde, M., Bolland, D., Armand, A., Pritsch, E., Bakker K., Wallert, M. and Provost J.J. Functional Consequences of Inhibiting Sodium Hydrogen Exchanger 1 (NHE1). MS Pending J Biol Chem 2020
2. Cottle, W.T., Wallert M.A., Anderson K., Tran M., Wallert C., and Provost J.J. Calcineurin Homologous Protein Isoform 2 Supports Tumor Survival via the Sodium Hydrogen Exchanger Isoform 1 in Non-Small Cell Lung Cancer. In Press Tumor Biology. 2020
3. Bell, L., Latzer, J., Suputra, M., Silva, D., Davis, J., Marshall, C., Wallert, M., and Provost J.J. Calcineurin B Homologous Protein Regulation of the Sodium Hydrogen Exchanger Isoform 1: More than Competition, The Need for a CHP-Specific Therapy. J. Cell Sci & Mol Biol In Press 2020
4. Procko, K., Bell, J.K., Benore, M.A., Booth, R.E., Del Gaizo Moore, B., Dries, D.R., Martin, D.J., Mertz, P.S., Offerdahl, E.G., Payne, M.A., Vega, Q.C., and Provost J.J., Moving Biochemistry and molecular biology courses online in times of disruption: Recommended practices and resources – a collaboration with the faculty community and ASBMB. Biochem Mol Biol Educ, 2020, In Press
5. Provost, J.J. The Malliard Reaction. Chapter. Food Aroma Evolution (During Food Processing, Cooking and Aging) CRC Press | Taylor & Francis Group. Ed Leo, M.B., and Nollet, M.L. Dec 2 2019.
6. Provost, J.J., Bell, J.K., and Bell, J.E. Development and Use of CUREs in Biochemistry. Chpt 7 Biochemistry Education: From Theory to Practice. pp143-171. 2019
7. Wallert, MA., Hames D., Nguyen T., Kiefer, L., Berthelson N., Kern A., Anderson-Tiege K., Shabb J.B., Muhonen W.W., Grove B.D., and Provost, J.J. RhoA Kinase (Rock) and p90 Ribosomal S6 Kinase

- (p90Rsk) phosphorylation of the sodium hydrogen exchanger (NHE1) is required for lysophosphatidic acid-induced transport, cytoskeletal organization and migration. *Cell Signal*. 2015 Jan 8
8. Provost, J.J. and Wallert M.A. Inside Out: Targeting NHE1 as an intracellular and extracellular regulator of cancer progression. Review. *Chemical Biology and Drug Design*, 2013 18: 85-101.
 9. Provost, J.J. Rastedt, D., Canine, J., Nguyen T., Haak, A., Kutz, C., Berthelsen N., Slusser A., Anderson K., Dorsam G, and Wallert M.A. Urokinase plasminogen activator receptor induced non-small cell lung cancer invasion and metastasis *Cellular Oncology*. 2012 Vol 35: 95-11.
 10. Provost, J. J., Munis, P. and Morine, G. H. Alternate Method for Determining Zinc in Hair. *Microchemical Journal* , Vol. 47 pp. 28-32, 1993

Selected Articles in professional magazines and blogsites (20)

1. ASBMB Online teaching" Practices and Resources, May 2020
2. Academic Toughness – Planned Article, ASBMB Today June 2017
3. Mentoring Undergraduates at a National Meeting. The Substrate ASBMB Student Chapter March 2017
4. Research for all: A CURE for undergraduates. ASBMB Today 2016
5. The NIH-R15, Part 1: Who's in the rink? Council on Undergraduate Research Wordpress. Oct 31, 2016
6. The NIH-R15, Part 2: Taking your best shot. Council on Undergraduate Research Wordpress. Nov 14, 2016
7. Contributor – Working at a PUI. ASBMB Today January 2016 I have an interview! Now what? The Substrate ASBMB Student Chapter News December 2014
8. With Mike Pikaart. Thoughts on MOOCs. ASBMB Today February 2014
9. How to write a teaching philosophy statement when you don't have a lot of classroom experience. ASBMB Today December 2014
10. Becoming Competitive for a Teaching (and Research) Position: Part II The Substrate ASBMB Student Chapter News September 2014

Selected Invited Presentations/Workshops hosted (71 Total):

1. International Union of Biochemistry and Molecular Biology Education Workshop 46th PSBMB Annual Convention 2019 Manila Philippines.
2. Can you survive without food or oxygen? Cancer cells can! Haynes Biochemistry Lecture 2019.
3. Workshop: PUI - research culture and support a grant writing environment. Wabash University 2019.
4. Cooking in the Kitchen. Some molecules are hot. Wabash University Public Presentation. 2019
5. ASBMB Catalyst Conversations. La Serra Univ. CURE: Theory and Implementation. 2019 with E. Bell
6. ASBMB Platform Presentation CURES: Building communities to support and sustain protein biochemistry research in the teaching laboratory. 2017 W/ M Pikard
7. ASBMB Symposia Seven Weird Tricks to Getting the Most From and Writing a Textbook 2017 with J Tansey
8. Using Science of Cooking to broaden access of science. ACS Spring. 2016 with Colbroy K.
9. Role of CHP2 and NHE1 in Lung Cancer: A Novel Modality of Cancer Treatment. UC Long Beach. 2016.
10. Is the grass greener on the other side of the fence? Mid career opportunities and options for science faculty. Cur Conference workshop 2012 with Wheeler, K., Parson, K
11. Directed Cell Motility and Lung Cancer Development – Bradley University 2011
12. NHE1 - RhoA Kinase Phosphorylation and ERM Binding. James Madison University Dept of Chemistry 2011
13. Creighton Medical School, Dept of Pharmacology – Non Small Lung Cell Cancer and NHE1 2009
14. Regulation Of A RhoA-Specific Phospholipase D By Protein-Protein Interaction. EPSCoR Conference on Protein-Protein Interactions. 1998.

Selected Professional Abstracts (158 Total): Underlined names indicate undergraduates

1. Bell J.K., Provost J.J., and Bell J.E. Joining the Malate Dehydrogenase CUREs Community: Levels of Engagement. *Transforming Undergraduate Education in the Molecular Life Sciences*. 2019.
2. Provost J.J., Bell J.E., and Bell J.K. Hypothesis Development and Proposal Presentation/ Experimental Design in CUREs and Undergraduate Experience. *Transforming Undergraduate Education in the Molecular Life Sciences*. 2019.
3. Huisinga K.L., Christian L.M., Kuhn M.L., Parente A.D., Peterson C.N., and Provost J.J. Developing resources to support CURE projects investigating protein-protein interactions, post translational modification and gene regulation for the MDH CURE Community (MCC). *FASEB J* April 2019 33:1:454.11
4. Hanowski S.A., Provost J.J., and Wallert M.A. Evaluating the role of NHE1 Palmitoylation in the Regulation of Cell Proliferation and Migration. *FASEB J* April 2019 33:1:476.10
5. Hovde M.J., Bolland D.E., Provost J.J., Wallert M.E., Vaughan R.A., and Foster J.D. Sodium hydrogen exchanger isoform I (NHE1) palmitoylation and phosphorylation barcoding: Implications on regulation and function. *FASEB J* April 2019. 33:1:632.8