CURRICULUM VITAE

Richard J. Bridges

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PERSONAL DATA:

Birthdate:	November 16, 1955
Place of Birth:	Zweibrucken, Germany
Citizenship:	U.S.A.

EDUCATION:

B.S.: University of California, Davis, (Biochemistry), 1977

Ph.D.: Cornell University Graduate School of Medical Sciences, (Biochemistry), 1984

RESEARCH INTERESTS:

Glutamate Transport and Metabolism, Excitatory Amino Acid Receptor Pharmacology, Mechanisms of Excitatory Amino Acid-Mediated Neurotoxicity, Gliotoxicity, Glial Tumors

POSITIONS HELD:

2011-	Regents Professor, Department of Biomedical & Pharmaceutical Sciences, Skaggs School of Pharmacy, University of Montana, Missoula
2008-2015	Chair, Department of Biomedical &Pharmaceutical Sciences, University of Montana
2000-2008	Director, NIH COBRE Center for Structural and Functional Neuroscience Dept. of Biomedical & Pharmaceutical Sci., University of Montana
1998-	Professor, Department of Pharmaceutical Sciences, School of Pharmacy and Allied Health Sciences, University of Montana, Missoula
1993-1998	Associate Professor, Department of Pharmaceutical Sciences, School of Pharmacy and Allied Health Sciences, University of Montana, Missoula
1995-1998	Clinical Associate Professor, Department of Neurology, California College of Medicine, University of California, Irvine
1993-1995	Associate Professor in Residence, Department of Neurology, California College of Medicine, University of California, Irvine
1987-1993	Assistant Professor in Residence, Department of Neurology, California

	College of Medicine, University of California, Irvine
1984-1987	NIH Postdoctoral Fellow, Dr. Carl Cotman, Department of Psychobiology, University of California, Irvine
1977-1984	Predoctoral Fellow, Dr. Alton Meister, Biochemistry Department, Cornell University Medical College
Winter 1977	Teaching Assistant, Dr. J.P. Preiss, Department of Biochemistry and Biophysics, University of California, Davis
1975-1977	Research Assistant, Dr. I.H. Segel, Department of Biochemistry and Biophysics, University of California, Davis

AWARDS, HONORS, & NOTABLE PROFESSIONAL SERVICE:

1978-1979	Blau Fellow, Cornell University Medical College
1985-1987	National Research Service Award, NIH
1991-1993	Board of Directors, Paralysis Project of California
1991- 2002	Scientific Advisory Committee, Paralysis Project of California
1992-2002	Editorial Board of the *Journal of Spinal Cord Medicine*
1992	First Step Service Award Paralysis Project of California
1995	Burroughs-Wellcome International Travel Fellow, Institute of Psychiatry, London
1995	Merit Award, University of Montana
1997	Instructor of the Year Award, Univ. of Montana School of Pharmacy
1997	Merit Award, University of Montana
1998	NIH NLS-2 Study Section, Ad-hoc Member
1998-Present	Founding Member, Board of Directors, *Montana Neuroscience Institute*
2001	Merit Award, University of Montana
2002	NIH MDCN4 Study Section Ad-hoc Member
2003	COBRE Special Emphasis Panel Member
2003	Mershon Award, Scientific Contributions, Montana Academy of Sciences
2003	Merit Award, University of Montana
2004	NIH MDCN Study Section Special Emphasis Panel Member
2004	University of Montana, Provost's Distinguished Faculty Lecturer
2004-2011	Founding Member, Board of Directors, Montana BioScience Alliance
2004-2012	Univ. of Alaska-SNRP Basic Neuroscience Center Program Advisory Committee, Current Chair
2005	NIH NTRC Study Section, Ad-hoc Member
2006	Organizing Committee and Session Chair, National IDeA Symposium of Biomedical Research Excellence, Washington, DC
2007	Merit Award, University of Montana
2007-2009	Member, RCMI/IDeA Program Review and Advisory Panel, NIH
2007-Present	Board of Directors, *Montana Neuroscience Institute*
2008-Present	Univ. of North Dakota, COBRE Neuroscience Center Program Advisory Committee
2008	Dennison Presidential Faculty Award, University of Montana
2009	NIH NTRC Study Section, SEPA panel member
2010	NIH MDN Study Section SEPA panel reviewer
2010	Merit Award, University of Montana
2010	Brain Science Institute, SPCD Review Panel, Johns Hopkins School of Medicine

2011 Regents Professor, University of Montana
2014 NIH ZRG1 MDCN-B SEPA Reviewer and Session Chair
2014 Affiliate Director Project Lead the Way STEM Biomedical Sciences Initiative

PUBLISHED WORKS:

Griffith, O.W., Bridges, R.J., and Meister, A. (1978) Evidence that the γ–glutamyl cycle functions *in vivo* using intracellular glutathione; effects of amino acids and selective inhibition of enzymes, *Proceedings of the National Academy of Sciences*, U.S., **75**, 5405.

Griffith, O.W., Bridges, R.J., and Meister, A. (1979) Transport of γ-glutamyl amino acids; role of glutathione and γ-glutamyl transpeptidase, *Proceedings of the National Academy of Sciences*, U.S., **76**, 6319.

Anderson, M.E., Bridges, R.J., and Meister, A. (1980) Direct evidence for interorgan transport of glutathione and that the non-filtration renal mechanism for glutathione utilization involves γ-glutamyl transpeptidase, *Biochemical and Biophysical Research Communications*, **96**, 848.

Bridges, R.J., Griffith, O.W., and Meister, A. (1980) *Threo*-L-(β-methyl)glutamyl-L-α-aminobutyrate, a specific substrate of γ-glutamyl cyclotransferase: *in vivo* inhibition by β-aminoglutaryl-L-α-aminobutyrate, *Journal of Biological Chemistry*, **256**, 10, 10787 .

Griffith, O.W., Bridges, R.J., and Meister, A. (1981) Formation of γ–glutamylcyst(e)ine *in vivo* is catalyzed by γ-glutamyl transpeptidase, *Proceedings of the National Academy of Sciences*, U.S., **78**, 2777 .

Abbott, W.A., Bridges, R.J., and Meister, A. (1983) Extracellular metabolism of glutathione accounts for its disappearance from the basolateral circulation of the kidney, *Journal of Biological Chemistry*, **259**, 15393 .

Bridges, R.J., and Meister, A. (1985) γ-Glutamyl amino acids: transport and conversion to 5-oxoproline in the kidney, *Journal of Biological Chemistry*, **260**, 7304 .

Bridges, R.J., Abbott, W.A., Murata, K., and Meister, A. (1985) Enzymatic synthesis of istotopically-labeled glutathione by means of an immobilized cell matrix, in Methods in Enzymology, **113**, 567, (A. Meister ed.) Academic Press, NY, NY.

Bridges, R.J., Hearn, T.J., Monaghan, D.T., and Cotman, C.W. (1986) A comparison of AP4 receptors and ^{3}H-AP4 binding sites in the rat brain, *Brain Res.,* **375**, 204 .

Bridges, R.J., Nieto-Sampedro, M., Kadri, M., and Cotman, C.W. (1987) A novel chloride-dependent ^{3}H-L-glutamate binding site in astrocyte membranes, *Journal of Neurochemistry*, **48**, 1709-1715 .

Bridges, R.J., Geddes, J., Monaghan, D.T., and Cotman, C.W. (1987) Excitatory amino acid receptors in Alzheimer's disease, in Excitatory Amino Acids in Health and Disease, (D. Lodge ed.) John Wiley and Sons Limited, Sussex, England, pp: 321-335 .

Bridges, R.J., Kesslak, J.P., Nieto-Sampedro, M., Broderick, J.T., Yu, J., and Cotman, C.W. (1987) A ^{3}H-L-glutamate binding site on glia: an autoradiographic study on implanted astrocytes, *Brain Research*, **415**: 163-168.

Bridges, R.J., Kadri, M., Monaghan, D.T., Nunn, P.B., Watkins, J.C., and Cotman, C.W. (1988) Inhibition of ^{3}H-α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) by the excitotoxin β-N-oxalyl-L-α,β–diaminopropionic acid. *Eur. J. Pharmacol.* **145**, 357-359 .

Cotman, C.W., Bridges, R.J., Geddes, J.W., Monaghan, D.T., and Cahan L.D. (1988) Anatomical organization and plasticity of excitatory amino acid receptors in the rodent and human brain: predictions on their functional state in neurodegenerative diseases. in Inhibitory and Excitatory Amino Acid Transmitters, (E. Costa ed) FIDIA,.

Bridges, R.J., Stevens, D.R., Kahle, J.S., Nunn, P.B., Kadri, M., and Cotman, C.W. (1989) Structure-function studies on N-oxalyl-diamino-dicarboxylic acids and excitatory amino acid receptors: evidence that β-L-ODAP is a selective non-NMDA agonist. *J. Neurosci.* 9, 2073-2079 .

Anderson, M.E., Underwood, M., Bridges, R.J., and Meister, A.M. (1989) Glutathione metabolism at the blood-cerebrospinal fluid barrier, *FASEB J.*, **3**, 2527-2531 .

Cotman, C.W., Geddes, J.W. Bridges, R.J., and Monaghan, D.T. (1989) N-Methyl-D-aspartate receptors in Alzheimer's disease, *Neurobiol. of Aging* **10**: 603-605.

Monaghan, D.T., Bridges, R.J., and Cotman, C.W. (1989) The excitatory amino acid receptors: their classes, pharmacology, and distinct properties in the function of the central nervous system. *Ann. Rev. of Pharmacol. and Toxicol.* **29**, 365-402 .

Cotman, C.W., Bridges, R.J., Taube, J.S., Clark, A.S., Geddes, J.W., and Monaghan, D.T. (1989) The role of the NMDA receptor in central nervous system plasticity and pathology. *J. NIH Res.* **1**, 65-74.

Anderson, K.J., Monaghan, D.T., Bridges, R.J., and Cotman, C.W. (1990) Autoradiographic characterization of excitatory amino acid transport sites, *Neurosci.* **38**, 311-322.

Gardner, V.O., Caiozzo, V.J., Munden, S.K., and Bridges, R.J. (1990) Excitotoxins can produce protein degradation in the spinal cord, *Spine* **15**, 858-863.

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Bridges,R.J. Hatalski, C.G., Shim, S.N., and Nunn, P.B. (1991) Gliotoxic properties of the Lathyrus excitotoxin β-N-oxalyl-L-α,β–diaminopropionic acid (β-L-ODAP), *Brain Res.* **561**, 262-268.

Miller, S., Cotman, C.W., and Bridges, R.J. (1992) 1-Aminocyclopentane-*trans*-1,3-dicarboxylic acid induces glutamine synthetase activity in cultured astrocytes. *J. Neurochem.* **58**, 1967-1970.

Bridges, R.J., Hatalski, C.G., Shim, S.N., Cummings, B.J., Vijayan, V., Kundi, A., and Cotman, C.W. (1992) Gliotoxic actions of excitatory amino acids. *Neuropharmacology* **32**, 899-907.

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Liu, L., Bridges, R.J. Eyer, C.L. (2001) Effect of cytochrome P450 1 A induction on oxidative damage in rat brain. *Molecular and Cellular Biochemistry*, **223**, 89-94.

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Recently Published Abstracts

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Gerdes, J., VanBrocklin, H., Sattler, R., Bridges, R., (2013) Translational Progress of the ALS EAAT2 PET Imaging Tracer Packard Center ALS Research Symposium, Baltimore, MD

Patel, S.A., Newell, J., Braden, M., Keyari, C., Diaz, P.J., Natale, N.R., Bridges, R.J., (2013) Mapping substrate binding domains on the System xc- cystine/glutamate antiporter *Society for Neuroscience Abstracts*, 39, **703.06**.

Bridges, R.J., Igual,M.O., Capeletti Da Silva, L., Patel, S.A., Braden, M., Duncan, N., Weaver, M., Natale, N.R. (2014) Naphthyl-3-isoxazole analogs of 2,6-dibromo tyrosine (NIM-DBT) synthesis and System Xc- activity, Northwest Regional Meeting of the American Chemical Society, Missoula MT, abstract **NORM153**.

Patel, S.A., Newell, J., Braden, M., Diaz, P.J., Natale, N.R., Bridges, R.J (2014) Structural comparisons of isoxazole-based non-competitive and competitive inhibitors of the system xc- antiporter *Society for Neuroscience Abstracts*, 40, **127.08**

VanBrocklin, H.F., Bridges, R.J., Sattler, R., Pomper, M., Gerdes, J.M., (2015) IND Enabling Efforts and Accomplishments for the ALS EAAT2 PET Imaging Tracer, Packard Center ALS Research Symposium, Baltimore, MD

Bridges, R.J., Chase, L., Patel, S.A., Hewett, S.J. (2015) The System xc- glutamate / cysteine exchanger: consequences of the revolving door, Winter Conference on Brain Research, Big Sky, MT

GRADUATE STUDENTS SUPERVISED:

Colleen Baker; MS in Pharmaceutical Sciences, 9/95
Wallace Webster; MS Pharmaceutical Sciences, 8/98
Liping Liu; MS Pharmaceutical Sciences, 7/98 (Co-supervision with C. Eyer)
Richard Bartlett; PhD in Pharmaceutical Sciences, 5/99
Hans Koch; PhD in Pharmaceutical Sciences, 6/99
Sarj Patel; Ph.D., in Pharmaceutical Sciences 9/99
Kristin Reed, M.S. ., in Pharmaceutical Sciences, 6/01
Brady Warren; Ph.D. in Pharmaceutical Sciences, 5/04
Todd Seib, M.S in Biological Sciences 7/04
Wes Smith; Ph.D. in Pharmaceutical Sciences, 1/07
Shailesh Agarwal; Ph.D. in Pharmaceutical Sciences, 5/07
Ran Ye; Ph.D. in Chemistry, 4/09
Todd Seib, Ph.D. in Pharmaceutical Sciences, 8/10
Jayme Newell, M.S. in Pharmaceutical Sciences 5/14

POSTDOCTORAL SUPERVISION

Munaf Kadri, MD
Sean Esslinger, Ph.D. (Shared supervision with C. Thompson, Chemistry)
Michael Anderson; MD
Colin Willis; Ph.D
Sarj Patel, Ph.D.

RECENT INVITED LECTURES:

Regional

Montana BioScience Alliance (10/11)
St. Patrick Hospital, Montana Neuroscience Institute Retreat, Missoula, MT (12/11)
University of Montana, Provost's Distinguished Lecture (12/12)

Montana State Science Fair Keynote lecture, Univ. of Montana (3/14)
UM, High School Science Students Harkins Fusion Lecture series (11/14)
St. Patrick Hospital Montana Cancer Institute, Missoula, MT (3/15)

National

National Acad. of Sci. Committee, Review of EPSCoR & IDeA Programs, Wash. DC (9/12)
Dept. of Pharmacology, University of Washington School of Medicine, Seattle, WA (3/13)
Neuroscience Program, Vanderbilt, Nashville, TN (10/13)
Winter Conference on Brain Research (Session Organizer), Big Sky, MT (1/15)

International

University of Pereira, Pereira, Columbia (3/13)
International Soc. for Neurochemistry (Organizing Committee), Cancun, Mexico (4/13)

PATENTS

U.S. Patent No. 5,942,537, Issues Aug 24, 1999
Inventors; Chamberlin, A.R., Cotman, C.W., Stanley, M., and Bridges, R.J.
Methods of inhibiting the transport of L-glutamate to treat CNS disorders
UC Case No. 89-036-2

U.S. Provisional Patent Application Docket UMT-110P
Inventors: Esslinger, C.S., Bridges, R.J., and Kavanaugh, M.P.
3-Alkylaryl aspartate compounds and their use for selective enhancement of synaptic transmission

U.S. Provisional Patent Application Docket No. UMT-120P, Serial No. 61/089,484
Inventors: Natale, N.R.; Bridges, R.J.; Patel, S.; Rajale, T.
Isoxazoles with in vivo anti-convulsive activity
Serial No. 61/089,484, U.S. August 15, 2008.

US Provisional Patent, UM Ref 2011-035-01
Inventors: J. Gerdes, S. Ahmed, S. Patel, R. Bridges
"Novel Aspartylamide Inhibitors of Excitatory Amino Acid Transporters"
Filed March 2012

US Provisional Patent, 62/015,178
Inventors: N. Natale, R. Bridges, S. Patel
Isoxazoles as allosteric inhibitors of system xc- transporter
Filed June 20, 2014

U.S. Patent submission PRO10495P00121US
Inventors: N. Natale, R. Bridges, S. Patel., N. Duncan, M. Weaver, M. Gajewski
Novel Inhibitors of System Xc-
Filed June 19, 2015

COMPLETED RESEARCH FUNDING

NIH RO1: Bridges: PI
Excitotoxicity, the role of non-NMDA receptors,
Grant Period: 1989-1992

NIH RR-11796: Bridges: Project Director (Paden, MSU: Co-PI)
Advancement of neuroscience in Montana
Grant Period: 9/30/96 - 8/31/99

Paralysis Project: Bridges: PI
The role of glutamate transporters in spinal cord injury
12/15/96-12/14/97:

NIH P20 RR10169 (IDEAS): Bridges: PI,
Development of a CNS tissue culture facility,
3/1/95-2/28/98,

NIH: NSRA Postdoctoral Fellowship for Sean Esslinger
Bridges: Research Supervisor (Thompson co-advisor).
CNS glutamate analogues: distal COOH substitutions.
Grant Period: 1/1/97 - 12/31/98

NIH (AREA): Bridges: Collab. Invest., (PI: Eyer)
Are the glutamate systems target in trimethyltin toxicity?
Grant Period:7/95-11/97

EPSCoR MONTS Award: Bridges: Program Director,
Fluorescent detection of oxidative damage to the central nervous system.,
2/1/94-8/31/94

Paralysis Project: Bridges: Collab. Investigator (S. Queen, U.M.: PI),
Glutamate transporters: targets in spinal cord injury?
12/15/98-12/14/99

NIH P20 RR15583-01: Bridges: PI, (Thompson, Ross, Gerdes Co-PI)
COBRE Equipment Supplement
9/1/02-8/31/03

Montana Board of research and Technology Commercialization
Bridges: PI, (Poulsen Co-PI)
Enhancement of Applied Research in Biomedicine
7/1/03 - 6/30/10
Competitive renewal (Kavanaugh Co-PI)
7/1/10 -6/30/11
Competitive renewal (Kavanaugh, Fanguy Co-PI)
7/1/13 -6/30/14

NIH R21 NS42077: Bridges: PI,
Vesicular glutamate transport; neurosteroid regulation
7/1/01-6/30/02, Total costs: ≈ $130,000
Grant Period: 7/1/01-6/30/03

Murdock Charitable Trust: Bridges, PI, (Collab: Coffin, Kavanaugh)
Functional Assessment for Animal Models of Human Disease
10/1/06 – 7/1/07

NIH P20 RR15583: Bridges: PI, (PI changed to M. Kavanaugh, 5/1/08)
COBRE Center for Structural and Functional Neuroscience
Grant Period: 10/1/01-4/31/10

NIH: RO1 NS 27600: Bridges: Collab. Investigator (A.R. Chamberlin, U.C. Irvine: PI),
Receptor specific excitatory amino acid analogues,,
Grant Period: 4/1/98-3/31/08

NIH RO1 NS38248: Bridges: Co-Investigator (C.M. Thompson, U.M.: PI),
Vesicular glutamate transport: pharmacophore elucidation
Grant Period: 9/1/99-8/31/08

NIH RO1 NS30570: Bridges: PI,
Properties and roles of excitatory amino acid transport,
Grant Period: 7/1/96-12/31/08

Robert Packard ALS Foundation: Bridges: Co-PI (J. Gerdes, UM, PI)
Cerebral PET imaging agents for monitoring ALS therapy
10/1/06 - 5/31/09 (Yearly Competitive Renewal)

NIH 5R21NS067466: Bridges: Co-PI (Natale, Co-PI)
Fluorescent-based Probes for the Glutamate/Cystine Exchanger System Xc-
10/1/09-9/30/12

NIH P20GM103546 Pilot Project: Bridges: Co-PI (S. Patel, UM, Co-PI)
Structure-function of the system xc- glutamate/cystine exchanger:Identification of xct residues participating in binding and translocation
11/1/11 - 7/31/12

P2 ALS Foundation: Bridges: Co-PI (J. Gerdes, UM, PI)
Cerebral PET imaging agents for monitoring ALS therapy
1/1/09 - 12/31/13 (Yearly Competitive Renewal)

CURRENTLY ACTIVE RESEARCH FUNDING

Montana Board of Research and Technology Commercialization
Enhancement of applied research in biomedicine
Bridges: Co-PI, (Kavanaugh, Fanguy Co-PIs)
7/1/14- 6/30/16

NIH R15 NS088899, Bridges: PI,
Molecular Pharmacology of the System xc- Glutamate/Cystine Antiporter
7/1/14 - 6/30/16