

Richard Carl Holz

September 25, 2007

Current Address:

Loyola University-Chicago
Department of Chemistry
Chicago, IL 60626

Phone: (773) 508-7045
E-mail: RHOLZ1@LUC.EDU

Publications: (70 Total; 1,443 citations)

1. Holz, Richard C.; Snyder, A. Peter; Horrocks*, William DeW., Jr., "Lanthanide Ion Complexes as Energy Acceptors for Excited-State Europium(III) and Terbium(III) in Diffusion-Enhanced Energy Transfer Studies". *Lanth. Act. Res.*, **1988**, 2, 363.
2. Holz, Richard C.; Thompson*, Larry C., "Spectroscopic and Structural Characterization of the Nine Coordinate Adduct of Tris(dipivaloylmethanato)europium(III) with 2,2':6',2''-terpyridine" *Inorg. Chem.*, **1988**, 27, 4640.
3. Holz, Richard C.; Horrocks*, William DeW., Jr., "Spectroscopic Characterization of Some Rare Earth Complexes of Tetraethylenetetraaminehexaacetic Acid" *Inorg. Chim. Acta*, **1990**, 171, 193.
4. Holz, Richard C.; Klakamp, Scott L.; Chang*, C. Allen; Horrocks*, William DeW., Jr., "Characterization of Macrocyclic Diaza Crown Ether Ligands Containing Carboxylate Ligating Groups Using Laser-Induced Europium(III) Luminescence and NMR Spectroscopy" *Inorg. Chem.*, **1990**, 29, 2651-2658.
5. Holz, Richard C.; Horrocks*, William DeW., Jr., "Yttrium-89 NMR Spectroscopy: A New Spectroscopic Probe for Calcium-Binding Proteins" *J. Mag. Res.*, **1990**, 89, 627-629.
6. Holz, Richard C.; Meister, Gretchen E.; Horrocks*, William DeW., Jr., "Spectroscopic Characterization of the Europium(III) Complexes of Several Aminophosphonic Acids in Solution" *Inorg. Chem.*, **1990**, 29, 5183-5189.
7. Norman, Richard E.; Holz, Richard C.; Menage, Stephane; Que*, Lawrence, Jr., "Structures and Properties of Dibriged (μ -Oxo)Diiron(III) Complexes. Effects of the Fe-O-Fe Angle" *Inorg. Chem.*, **1990**, 29, 4629-4637.
8. Britton*, Doyle; Thompson*, Larry C.; Holz, Richard C., "Structure of 2,9-Dimethyl-1,10-Phenanthroline Hemihydrate" *Acta Cryst.*, **1991**, C47, 1101-1103.
9. Holz, Richard C.; Chang*, C. Allen; Horrocks*, William DeW., Jr., "Laser-Induced Europium(III) Luminescence and NMR Spectroscopic Characterization of a Series of N,N'-Bis(carboxymethyl) Macrocyclic Ether-Bis(lactone) Complexes" *Inorg. Chem.*, **1991**, 30, 3270-3275.
10. Wang, Dan-Li; Holz, Richard C.; David, Sheila S.; Que*, Lawrence, Jr.; Stankovich*, Marion T., "Electrochemical Properties of the Diiron Core of Uteroferrin and its Anion Complexes" *Biochemistry*, **1991**, 30, 8187-8194.
11. Holz, Richard C.; Ming*, Li-June; Que*, Lawrence, Jr., "NOESY Studies on the Fe^{III}Co^{II} Active Site of the Purple Acid Phosphatase Uteroferrin" *J. Am. Chem. Soc.*, **1992**, 114, 4434-4436.
12. Holz, Richard C.; Salowe, Scott C.; Marcy, Alice, I.; Cuca, Gregory, C.; Que*, Lawrence, Jr., "EXAFS Evidence for the "Cysteine Switch" Mechanism in the Maturation of Stromelysin" *J. Am. Chem. Soc.*, **1992**, 114, 9611-9614.

13. Crans*, Debbie C.; Simone, Carmen M.; Holz, Richard C.; Que*, Lawrence, Jr., "The Interaction of Porcine Uterine Fluid Purple Acid Phosphatase with Vanadate and Vanadyl Cation" *Biochemistry*, **1992**, *31*, 11731-11739.
14. True, Anne E.; Scarrow, Robert; Randall, Clayton R.; Holz, Richard C.; Que*, Lawrence, Jr., "EXAFS Studies of Uteroferrin and Its Anion Complexes" *J. Am. Chem. Soc.*, **1993**, *115*, 4246-4255.
15. Holz, Richard C.; Thompson*, Larry C., "Spectroscopically Distinct Geometrical Isomers in a Single Crystal. Characterization of the Eight-Coordinate Adducts of Tris(dipivaloylmethanato)lanthanide(III) with 2,9-Dimethyl-1,10-phenanthroline" *Inorg. Chem.*, **1993**, *32*, 5251-5256.
16. Holz, Richard C.; Elgren, Timothy E.; Pierce, Linda L.; Zhang, J. H.; O'Connor, C. J.; Que*, Lawrence, Jr., "Spectroscopic and Electrochemical Properties of (μ -Oxo)Diiron(III) Complexes Related to Diiron-Oxo Proteins. Structure of $[\text{Fe}_2\text{O}(\text{TPA})_2(\text{MoO}_4)](\text{ClO}_4)_2$ " *Inorg. Chem.*, **1993**, *32*, 5844-5850.
17. Ming*, Li-June; Lynch, John B.; Holz, Richard C.; Que*, Lawrence, Jr., "One- and Two-Dimensional ^1H NMR Studies of the Active Site of Iron(II) Superoxide Dismutase from *Escherichia coli*" *Inorg. Chem.*, **1994**, *33*, 83-87.
18. Holz*, Richard C.; Brink, Julie M. "Proton NMR Spectroscopy as a Probe of Dinuclear Copper(II) Complexes" *Inorg. Chem.*, **1994**, *33*, 4609-4610.
19. Holz*, Richard C.; Brink, Julie M.; Gobena, Feben T.; O'Connor, Charles J. "Dinuclear Copper(II) Complexes with Carboxylate Rich Coordination Environments. Models for Substituted Copper(II) Aminopeptidases" *Inorg. Chem.*, **1994**, *33*, 6086-6092.
20. Lanzilotta, William N.; Holz*, Richard C.; Seefeldt*, Lance C. "Proton NMR Investigations into the Nucleotide Induced Conformational Changes of the Reduced Four-Iron Cluster of the Nitrogenase Iron Protein from *Azotobacter vinelandii*" *Biochemistry*, **1995**, *34*, 15646-15653.
21. Holz*, Richard C.; Brink, Julie M.; Rose, Rachel A. "J-Dependent Curie or Anti-Curie Behavior of Proton NMR Resonances for Antiferromagnetically Coupled Dinuclear Copper(II) Complexes" *J. Mag. Res. A*, **1996**, *119*, 125-128.
22. Holz*, Richard C.; Gobena, Feben T. "Synthesis, Molecular Structure, and Reactivity of a New Dicopper(II) Benzimidazole Complex with Non-Identical Copper(II) Sites" *Polyhedron*, **1996**, *15*, 2179-2185.
23. Brink, Julie M.; Rose, Rachel A.; Holz*, Richard C. "Characterization of the Structural and Electronic Properties of Spin-Coupled Dinuclear Copper(II) Centers by Proton NMR Spectroscopy" *Inorg. Chem.*, **1996**, *35*, 2878-2885.
24. Holz*, Richard C.; Evdokimov, Evgenij; Gobena, Feben T. "Two-Dimensional ^1H NMR Studies on Octahedral Nickel(II) Complexes" *Inorg. Chem.*, **1996**, *35*, 3808-3814.
25. Bennett, Brian; Holz*, Richard C. "EPR Studies on the Mono- and Dicobalt(II) Substituted Forms of the Aminopeptidase from *Aeromonas proteolytica*. Insight into the Catalytic Mechanism of Dinuclear Hydrolases" *J. Am. Chem. Soc.*, **1997**, *119*, 1923-1933.

26. Chen, Guanjing; Edwards, Tanya; D'souza, Ventris; Holz*, Richard C. "Mechanistic Studies on the Aminopeptidase from *Aeromonas proteolytica*: A Two-Metal Ion Mechanism for Peptide Hydrolysis" *Biochemistry*, **1997**, *36*, 4278-4286.
27. Bennett, Brian; Holz*, Richard C. "Spectroscopically Distinct Cobalt(II) Sites in Heterobimetallic Forms of the Aminopeptidase from *Aeromonas proteolytica*: Characterization of Substrate Binding" *Biochemistry*, **1997**, *36*, 9837-9846.
28. Holz*, Richard C.; Small, Frederick J.; Ensign*, Scott, A. "Proton NMR Investigation of the [2Fe-2S]⁺ Containing "Rieske-Type" Protein from *Xanthobacter* Strain Py2" *Biochemistry*, **1997**, *36*, 14690-14696.
29. Holz*, Richard C.; Bradshaw, John M.; Bennett, Brian "Synthesis, Molecular Structure, and Reactivity of Dinuclear Copper(II) Complexes with Carboxylate Rich Coordination Environments" *Inorg. Chem.*, **1998**, *37*, 1219-1225.
30. Holz*, Richard C.; Bennett, Brian; Chen, Guanjing; Ming, Li-June "Proton NMR Spectroscopy as a Probe of Dinuclear Copper(II) Active Sites in Metalloproteins. Characterization of the Hyperactive Copper(II)-Substituted Aminopeptidase from *Aeromonas proteolytica*" *J. Am. Chem. Soc.*, **1998**, *120*, 6329-6335.
31. Bennett, Brian; Holz*, Richard C. "Inhibition of the Aminopeptidase from *Aeromonas proteolytica* by L-Leucinephosphonic acid, a Transition State Analogue of Peptide Hydrolysis" *J. Am. Chem. Soc.*, **1998**, *120*, 12139-12140.
32. DePaola, Carin; Bennett, Brian; Holz*, Richard C.; Ringe*, Dagmar; Petsko*, Gregory "L-Butaneboronic Acid Binding to *Aeromonas proteolytica* Aminopeptidase: A Case of Arrested Development" *Biochemistry*, **1999**, *38*, 9048-9053.
33. D'souza, Ventris; Holz*, Richard C. "The Methionyl Aminopeptidase from *Escherichia coli* Can Function as an Iron(II) Enzyme" *Biochemistry*, **1999**, *38*, 11079-11085.
34. Holz*, Richard C.; Alvarez, Marcela L.; Zumft, Walter; Dooley*, David "Proton NMR Studies on the Cu_A center of Nitrous Oxide Reductase" *Biochemistry*, **1999**, *38*, 11164-11171.
35. Ustynyuk, Leila; Bennett, Brian; Edwards, Tanya; Holz*, Richard C. "Inhibition of the Aminopeptidase from *Aeromonas proteolytica* by Aliphatic Alcohols. Characterization of the Hydrophobic Substrate Recognition Site" *Biochemistry*, **1999**, *38*, 11433-11439.
36. Huntington, Kristi M.; Bienvenue, David; Wei, Yaoming; Holz*, Richard C.; Pei*, Dehua "Slow-Binding Inhibition of the Aminopeptidase from *Aeromonas proteolytica* by Peptide Thiols: Synthesis and Spectral Characterization" *Biochemistry*, **1999**, *38*, 15587-15596.
37. Bienvenue, David; Bennett, Brian; Holz*, Richard C. "Inhibition of the Aminopeptidase from *Aeromonas proteolytica* by L-Leucine-thiol: Kinetic and Spectroscopic Characterization of a Slow, Tight-Binding Inhibitor-Enzyme Complex" *J. Inorg. Biochem.*, **2000**, *78*, 43-54.
38. D'souza, Ventris; Bennett, Brian; Copik, Alicja J.; Holz*, Richard C. "Divalent Metal Binding Properties of the Methionyl Aminopeptidase from *Escherichia coli*" *Biochemistry*, **2000**, *39*, 3817-3826.
39. Stamper, Carin; Bennett, Brian; Edwards, Tanya; Holz*, Richard C.; Ringe*, Dagmar; Petsko*, Gregory "Inhibition of the Aminopeptidase from *Aeromonas proteolytica* by L-Leucinephosphonic

acid. Spectroscopic and Crystallographic Characterization of the Transition State of Peptide Hydrolysis" *Biochemistry*, **2001**, *40*, 7035-7046.

40. Cospers, Nathaniel J.; D'souza, Ventris; Scott*, Robert; Holz*, Richard C. "Structural Evidence that the Methionyl Aminopeptidase from *Escherichia coli* is a Mononuclear Metalloprotease" *Biochemistry*, **2001**, *40*, 13302-13309.
41. Bienvenue, David L.; Mathew, Rebecca S.; Ringe*, Dagmar; Holz*, Richard C. "The Aminopeptidase from *Aeromonas proteolytica* Can Function as an Esterase" *J. Biol. Inorg. Chem*, **2002**, *7*, 129-135.
42. Bienvenue, David L.; Gilner, Danuta; Holz*, Richard C. "Hydrolysis of Thiopeptides by the Aminopeptidase from *Aeromonas proteolytica*" *Biochemistry*, **2002**, *41*, 3712-3719.
43. Meng, Lu; Ruebush, Shane; D'souza, Ventris M.; Copik, Alicja J.; Tsunasawa, Susumu; Holz*, Richard C. "Overexpression and Divalent Metal Binding studies for the Methionyl Aminopeptidase from *Pyrococcus furiosus*" *Biochemistry*, **2002**, *41*, 7199-7208.
44. Desmarais, William; Bienvenue, David; Bzymek, Krzysztof P.; Holz*, Richard C.; Petsko*, Gregory; Ringe*, Dagmar "The 1.2 Å Resolution Crystal Structure of the Aminopeptidase from *Aeromonas proteolytica* Complexed with Tris: A Tale of Buffer Inhibition" *Structure*, **2002**, *10*, 1063-1072.
45. D'souza, Ventris M.; Swierczek, Sabina I.; Cospers, Nathaniel J.; Meng, Lu; Copik, Alicja J.; Ruebush, Shane; Scott*, Robert; Holz*, Richard C. "Kinetic and Structural Characterization of Manganese(II)-Loaded Methionyl Aminopeptidases" *Biochemistry*, **2002**, *41*, 13096-13105.
46. Bennett*, Brian; Antholine, William A.; D'souza, Ventris; Ustynyuk, Leila; Chen, Guanjing; Holz*, Richard C. "Structurally Distinct Active Sites in the Copper-Substituted Aminopeptidases from *Aeromonas proteolytica* and *Escherichia coli*" *J. Am. Chem. Soc.*, **2002**, *124*, 13025-13034.
47. Copik, Alicja J.; Swierczek, Sabina I.; Lowther, W. Todd; D'souza, Ventris; Matthews*, Brian W.; Holz*, Richard C. "Kinetic and Spectroscopic Characterization of the H178A Mutant of the Methionyl Aminopeptidase from *Escherichia coli*" *Biochemistry*, **2003**, *42*, 6283-6292.
48. Bienvenue, David L.; Gilner, Danuta M.; Davis, Ryan S.; Bennett, Brian*; Holz*, Richard C. "Substrate Specificity, Metal Binding Properties, and Spectroscopic Characterization of the *dapE*-encoded-N-succinyl-L,L-Diaminopimelic Acid Desuccinylase from *Haemophilus influenzae*" *Biochemistry*, **2003**, *42*, 10756-10763.
49. Cospers, Nathaniel J.; Bienvenue, David L.; Shokes, Jacob; Gilner, Danuta M.; Tsukamoto, Takashi; Scott*, Robert; Holz*, Richard C. "The *dapE*-encoded N-succinyl-L,L-Diaminopimelic Acid Desuccinylase from *Haemophilus influenzae* is a Dinuclear Metallohydrolase" *J. Am. Chem. Soc.*, **2003**, *125*, 14654-14655.
50. Bzymek, Krzysztof P.; Holz*, Richard C. "The Catalytic Role of Glutamate-151 in the Leucine Aminopeptidase from *Aeromonas proteolytica*" *J. Biol. Chem.*, **2004**, *279*, 31018-31025.
51. Stamper, Carin; Bienvenue, David L.; Moulin, Aaron; Bennett*, Brian; Ringe*, Dagmar; Petsko*, Gregory; Holz*, Richard C. "Spectroscopic and X-ray Crystallographic Characterization of the Bestatin Bound Form of the Aminopeptidase from *Aeromonas proteolytica*" *Biochemistry*, **2004**, *43*, 9620-9628.

52. Bzymek, Krzysztof P.; D'souza, Ventris M.; Chen, Guanjing; Campbell, Heidi; Mitchell, Alice; Holz*, Richard C. "Function of the Signal Peptide and N- and C-Terminal Pro-Peptide in the Leucine Aminopeptidase from *Aeromonas proteolytica*" *Protein Express. Purif.*, **2004**, 37/2, 294-305.
53. Copik, Alicja J.; Nocek, Boguslaw; Swierczek, Sabina I.; Ruebush, Shane; SeBok, Jang; D'souza, Ventris M.; Peters*, John; Bennett, Brian*; Holz*, Richard C. "EPR and X-ray Crystallographic Characterization of the Product Bound Form of the Mn(II)-Loaded Methionyl Aminopeptidase from *Pyrococcus furiosus*" *Biochemistry*, **2005**, 44, 121-129.
54. D'souza, Ventris M.; Brown, Robert S.; Bennett*, Brian; Holz, * Richard C. "Characterization of the Active site and Insight into the Binding Mode of the Anti-Angiogenesis Agent Fumagillin to the Mn(II)-Loaded Methionyl Aminopeptidase from *Escherichia coli*" *J. Biol. Inorg. Chem.*, **2005**, 10, 41-50.
55. Copik, Alicja J.; Watterson, Sarah; Swierczek, Sabina I.; Bennett*, Brian; Holz*, Richard C. "Both Nucleophile and Substrate Bind to the Catalytic Fe(II) Center in the Type-II Methionyl Aminopeptidase from *Pyrococcus furiosus*" *Inorg. Chem.*, **2005**, 44, 1160-1162.
56. Rozhok, Sergey; Kwang-Fu Shen, Clifton; Littler, Pey-Lih Ho; Fan, Zhifang; Liu, Chang; Mirkin*, Chad A.; Holz*, Richard C. "Methods for Fabricating Microarrays of Motile Bacteria" *Small*, **2005**, 1, 445-451.
57. Rozhok, Sergey; Holz*, Richard C. "Electrochemical Adhesion of Motile Bacteria to Gold" *Talanta*, **2005**, 66, 538-542.
58. Swierczek, Krzysztof; Copik, Alicja J.; Swierczek, Sabina I.; Holz*, Richard C. "Molecular Discrimination of Type-I Methionyl Aminopeptidases Over Type-II." *Biochemistry*, **2005**, 44, 12049-12056.
59. Bzymek, Krzysztof P.; Moulin, Aaron; Swierczek, Sabina I.; Bennett*, Brian; Ringe*, Dagmar; Petsko*, Gregory; Holz*, Richard C. "Kinetic, Spectroscopic, and X-ray Crystallographic Characterization of the Functional E151H Aminopeptidase from *Aeromonas Proteolytica*." *Biochemistry*, **2005**, 44, 12030-12040.
60. McGregor, Wade; Swierczek, Sabina I.; Bennett, Brian*; Holz*, Richard C. "The *argE*-Encoded N-Acetyl-L-Ornithine Deacetylase from *Escherichia coli* Contains a Dinuclear Metallo-Active Site" *J. Am. Chem. Soc.*, **2005**, 127, 14100-14107.
61. Bzymek, Krzysztof P.; Swierczek, Sabina I.; Bennett*, Brian; Holz*, Richard C. "Spectroscopic Characterization of the E151D and E151A Altered Aminopeptidases from *Aeromonas Proteolytica*" *Inorg. Chem.*, **2005**, 44, 8574-8580.
62. Davis, Ryan; Bienvenue, David; Swierczek, Sabina I.; Gilner, Danuta M.; Rajagopal, Lakshman; Holz*, Richard C. "Kinetic and Spectroscopic Characterization of the E134 Altered *dapE*-encoded N-succinyl-L,L-Diaminopimelic Acid Desuccinylase from *Haemophilus influenzae*" *J. Biol. Inorg. Chem.*, **2006**, 11, 206-216.
63. Desmarais, William; Bienvenue, L. David; Bzymek, Krzysztof P.; Holz*, Richard C.; Petsko*, A, Gregory; Ringe*, Dagmar "The 0.95 Å Resolution and Low pH Crystal Structures of the Aminopeptidase from *Aeromonas proteolytica*" *J. Biol. Inorg. Chem.*, **2006**, 11, 398-408.

64. Mitra, Sanghamitra; Jiracek, Jiri; Zertova, Miroslava; Zakova, Lenka; Holz*, Richard C "A New Colorometric Assay for Methionyl Aminopeptidases: Examination of the Binding of a New Class of Pseudopeptide Analog Inhibitors " *Anal. Biochem.*, **2006**, 357, 43-49.
65. Rozhok, Sergey; Fan, Zhifang; Nyamjav, Dorjderem; Liu, Chang; Mirkin, Chad A.; Holz*, Richard C. "Attachment of Motile Bacterial Cells in a Pre-Aligned Holed Microarrays" *Langmuir.*, **2006**, 22, 11251-11254.
66. Frottin, Frédéric; Martinez, Aude; Peynot, Philippe; Mitra, Sanghamitra; Holz*, Richard C; Giglione, Carmela; Meinnel*, Thierry "The Proteomics of N-Terminal Methionine Cleavage" *Mol. Cell. Proteomics*, **2006**, 5, 2336-2349.
67. Nieman, J. Karl C.; Holz, Richard C.; Sims, Ronald C. "¹³C NMR Analysis of Biologically Produced Pyrene Residues By *Mycobacterium* Sp. KMS in the Presence of Humic Acid" *Environ. Sci. Technol.*, **2007**, 41, 242-249.
68. Mitra, Sanghamitra; Holz*, Richard C. "Unraveling the Catalytic Mechanism of Nitrile Hydratases" *J. Biol. Chem.*, **2007**, 282, 7397-7404.
69. McGregor, Wade; Bennett, Brian; Holz*, Richard C. "Kinetic and Spectroscopic Characterization of the Manganese(II)-Loaded *argE*-Encoded *N*-Acetyl-L-Ornithine Deacetylase from *Escherichia coli*" *J. Biol. Inorg. Chem.*, **2007**, 12, 603-613.
70. Muni, Petra; Moulin, Aaron; Stamper, Carin; Bennett, Brian; Holz*, Richard C.; Ringe*, Dagmar; Petsko*, Gregory "X-ray Crystallographic Characterization of the Co(II)-substituted Tris-bound forms of the Aminopeptidase from *Aeromonas proteolytica*" *J. Inorg. Biochem.*, **2007**, 101, 1099-1107.
71. Mitra, Sanghamitra; Bennett*, Brian; Holz*, Richard C Richard C. "Characterization of the H63 Altered Methionyl Aminopeptidase from *Escherichia coli*" *J. Biol. Inorg. Chem.*, submitted.