CURRICULUM VITAE FOR CHRISTOPHER RENSING

Chronology of Education

1996	Ph.D. at the Free University Berlin/Germany Advisor: Dr. Dietrich Nies Thesis: Bacterial Heavy Metal Resistances and their Expression in Eukaryotes.
1992	Diplom (equivalent to M. Sc.) at the Free University of Berlin/Germany Advisor: Dr. Bärbel Friedrich
1988	Vordiplom (equivalent to B. Sc.) at the Free University of Berlin Germany

Chronology of Employment

2012-present	Full Professor of Environmental Microbiology and Biotechnology, Department of Plant and Environmental Sciences, University of Copenhagen, Frederiksberg, Denmark
2011- 2012	Program Director, Center for Agricultural and Environmental Biotechnology, RTI International, Research Triangle Park, North Carolina
2007- 2011	Associate Professor Department of Soil, Water, and Environmental Science, University of Arizona
1999 – 2007	Assistant Professor Department of Soil, Water, and Environmental Science, University of Arizona
1996 – 1999	Postdoctoral Fellow Department of Biochemistry and Molecular Biology, Wayne State University, School of Medicine, Detroit, Michigan Advisors: Drs. Barry P. Rosen and Bharati Mitra
1991 – 1996	Research Fellow Department of Microbiology, Free University of Berlin and Martin-Luther University Halle/Wittenberg Advisors: Drs. B. Friedrich and D. Nies

Honors and Awards

1997	National Research Service Award by the National Institute of General Medical Sciences, National Institutes of Health, Bethesda, MD
2005	Visiting Scholar at the Thermal Biology Institute at Montana State University, Bozeman, MT.
2008	First Place for Outstanding Diversity by a Graduate Program by the Graduate & Professional Student Council at the University of Arizona

2008 Appointment as Guest Professor from July 1st 2008 to July 1st 2011 at Huazhong Agricultural University, Wuhan, China.

2011 Appointment as Adjunct Associate Professor at the University of Texas PanAmerican

2011 Appointment as Visiting Professor, King Saud University, Riyadh, Saudi Arabia

2011 Appointment as Visiting Professor, Institute of Urban Environment (IUE), Chinese Academy of Sciences, Xiamen, China

Service: Citizenship/Intramural

Commitees:

Departmental

- Chair, Strategic Planning Committee (2012-present)
- Member, Awards and Recognition Committee (2001-2004)
- Member Graduation Committee (May 2002)
- Member Environmental Pedologist Search Committee (2003-2004)
- Member, Peer Review Committee (1999-2004)
- Member, Curriculum Committee (2006-2010)
- Member, Scholarship Committee (2006-2009)
- Member, Long Term Direction Committee (2010-2011)
- Member, Departmental Seminar Committee (1999-2006)

College

- Microbiology Curriculum Committee (2001-2011)
- Microbiology Microbial Diversity Committee (2003-2011)
- Member of the Pathobiology Graduate Program (2006-2011)
- Member of the Microbiology Graduate Program (2006-2011)
- Member of Microbial Pathologist Search Committee (2008)
- Member of Promotion and Tenure Committee for Office of Arid Lands Studies (2010)

University

- Joint faculty appointment in the Division of Community, Environment and Policy of the Mel and Enid Zuckerman College of Public Health since 2010-2011
- Member of the Graduate Faculty, Department of Genetics (2000-2011)
- Electronic mentor for women and minority students (2006-2011)
- Undergraduate Biology Research Program (UBRP) faculty mentor (2001-2011)
- Training faculty for MARC (Minority Access to Research Careers) program (2007-2011)

- Selection Committee for Marshall Foundation Dissertation Fellowship (2007)
- Member of NSF REU Selection Committee

Service: Citizenship/Extramural

Professional Society Membership

- American Society of Microbiology (ASM)
- Soil Science Society of America (SSSA)
- Vereinigung für Allgemeine und Angewandte Mikrobiologie (VAAM)

Other Activities

- Associate Editor for *Frontiers in Microbiological Chemistry*
- Member of the Editorial Board of the *Journal of Bacteriology* for 2006-present
- Member of the Editorial Advisory Board for *Molecular Microbiology* 2010-2012
- Member of the Editorial Board for *BioMetals* 2005-present
- Member of the Editorial Board of the *Journal of Industrial Microbiology & Biotechnology* 2005-present
- Member of the Editorial Board for *Frontiers in Antimicrobials, Resistance and Chemotherapy*
- Member of the Editorial Board for *Journal of Environmental Science* 2013-present
- Managing Editor of *Saline Systems* 2004-2007
- Member of the Editorial Board for *Saline Systems*
- Member of the Editorial Board for *Romanian Journal of Biology - plant biology*
- President of the ASM Arizona/Southern Nevada Regional Branch 2009-2010
- President for Biometals 2010 conference organizing committee and editor of "Special Issue Tucson"
- Member of the Advisory Board *International Biometals Society*
- Grant panel reviewer for USDA "Soils and Soil Biology" (May 2001)
- Grant panel reviewer for DOE "Natural and Accelerated Bioremediation Research Program (NABIR)" (April 2005)
- Grant Panel reviewer for NIEHS "Superfund Basic Research and Training Program" (SBRP) 2007
- Grant Panel reviewer for NIEHS "Superfund Basic Research and Training Program" (SBRP) 2008
- Grant panel reviewer for DOE "Environmental Remediation Science Program (ERSP)" (October 2009)
- Grant Panel reviewer for NIEHS "Superfund Basic Research and Training Program" (SBRP) 2010
- Reviewer of 11th and the upcoming 12th edition of *Brock Biology of Microorganisms*
- Reviewer of upcoming 1st edition of *Microbiology-an evolving Science*
- Convener of ASM session at ASM meeting May 18-22, 2003; Washington, D.C.

- Co-Convener with Chad Saltikov of ASM session “Meddling with Metals” at ASM general meeting May 23-27 2010; San Diego, CA.
- Outside reviewer for promotion and tenure candidates at Brookhaven National Laboratory and at Bowling Green University
- Ad hoc reviewer for an NSF CAREER Grant and 15 regular NSF grants, a BBSRC research grant (UK), two grants to the Swiss National Science Foundation, a grant to the U.S. Civilian Research and Development Foundation (CRDF), a grant to the Strategic Alliance for Bioscience Research and Education (SABRE), a grant to CICEET (The Cooperative Institute for Coastal and Estuarine Environmental Technology), two grants to the US Army Medical Research and Material Command (USAMRMC) and two grants to the Wellcome Trust (UK)
- Reviewer of a grant from Jackson State University
- Reviewer of an application for a Postdoctoral Fellowship from the Dutch Academy of Science
- External examiner for a Ph.D. thesis from the University of Manitoba/Canada, a Ph.D. thesis from the University of Adelaide, Australia and two Ph.D. theses from the Martin-Luther University Halle/Wittenberg in Germany
- Published eleven reviews of scientific books in *ASM News/Microbe*, one in *Vadose Zone Journal* and one in *Saline Systems*

Manuscript reviewer for the following journals (total of 309)

- Antonie van Leeuwenhoek (3)
- Applied and Environmental Microbiology (24)
- Applied Microbiology and Biotechnology (9)
- Archives of Microbiology (12)
- Biochemistry (5)
- Biochimica and Biophysica Acta (2)
- Biodegradation (4)
- BioMetals (23)
- Bioresource Technology (1)
- BMC Genomics (2)
- BMC Microbiology (4)
- BMC Research Reports (1)
- Canadian Journal of Microbiology (3)
- Central European Journal of Biology (1)
- Chemical Research in Toxicology (2)
- Chemical Reviews (1)
- Ecotoxicology and Environmental Safety (2)
- Environmental Microbiology (2)
- Environmental Toxicology and Chemistry (1)
- Eukaryotic Cell (2)
- FEMS Microbiology Ecology (2)
- FEMS Microbiology Letters (24)
- FEMS Microbiology Reviews (1)

- Frontiers in Microbiology (2)
- International Microbiology (1)
- Journal of the American Chemical Society (2)
- Journal of Applied Microbiology (2)
- Journal of Bacteriology (68)
- Journal of Biological Chemistry (4)
- Journal of Environmental Sciences (2)
- Journal of Hazardous Materials (3)
- Journal of Industrial Microbiology and Biotechnology (18)
- Journal of Infectious Diseases (1)
- Journal of Inorganic Biochemistry (2)
- Journal of Inorganic Biological Chemistry (4)
- Journal of Molecular Microbiology and Biotechnology (1)
- Letters in Applied Microbiology (1)
- Metallomics (4)
- Microbial Ecology (3)
- Microbiological Research (1)
- Microbiology (5)
- Molecular Microbiology (35)
- Nature (1)
- Nature Chemical Biology (2)
- Plant Cell (1)
- Plant Physiology (1)
- PLoS Genetics (1)
- PLoS One (1)
- PLoS Pathogens (1)
- Proceedings of the National Academy of Science (1)
- Research in Microbiology (3)
- Saline Systems (4)
- Science of the Total Environment (2)
- Water, Air, & Soil Pollution (1)

Publications

h-index: 37

Peer-Reviewed Journal Articles

1. Rensing, C., U. Kües, U. Stahl, D.H. Nies and B. Friedrich. 1992. Expression of bacterial mercuric reductase in *Saccharomyces cerevisiae*. *J. Bacteriol*. 174: 1288-1292.
2. Rensing, C., B. Mitra, and B.P. Rosen. 1997. Insertional inactivation of *dsbA* produces sensitivity to cadmium and zinc in *Escherichia coli*. *J. Bacteriol*. 179: 2769-2771.
3. Sanders, O.I., C. Rensing, M. Kuroda, B. Mitra, and B.P. Rosen. 1997. Antimonite is accumulated by the glycerol facilitator GlpF in *Escherichia coli*. *J. Bacteriol*. 179: 3365-3367.

4. Rensing, C., T. Pribyl, and D.H. Nies. 1997. New functions for the three subunits of the CzcCBA cation-proton-antiporter. *J. Bacteriol*. 179: 6871-6879.
5. Rensing, C., B. Mitra, and B.P. Rosen. 1997. The *zntA* gene of *Escherichia coli* encodes a Zn(II)-translocating P-type ATPase. *Proc. Natl. Acad. Sci. USA* 94: 14326-14331.
6. Rensing, C., B. Mitra, and B.P. Rosen. 1998. A Zn(II)-transporting P-type ATPase from *Proteus mirabilis*. *Biochem. Cell Biol*. 76: 787-790.
7. Rensing, C., Y. Sun, B. Mitra, and B.P. Rosen. 1998. Pb(II)-translocating P-type ATPases. *J. Biol. Chem*. 273: 32614-32617.
8. Rensing, C., M. Ghosh, and B.P. Rosen. 1999. Families of soft-metal-ion-transporting ATPases. *J. Bacteriol*. 181: 5891-5897.
9. Sharma, R., C. Rensing, B.P. Rosen, and B. Mitra. 2000. The ATP hydrolytic activity of purified ZntA, a Pb(II)/Cd(II)/Zn(II)-translocating ATPase from *Escherichia coli*. *J. Biol. Chem*. 275: 3873-3878.
10. Rensing, C., B. Fan, R. Sharma, B. Mitra, and B. P. Rosen. 2000. CopA: an *Escherichia coli* Cu(I)-translocating P-type ATPase. *Proc. Natl. Acad. Sci. USA* 97: 652-656.
11. Grass, G., and C. Rensing. 2001. Genes involved in copper homeostasis in *Escherichia coli*. *J. Bacteriol*. 183: 2145-2147.
12. Grass, G., B. Fan, B.P. Rosen, K. Lemke, H.G. Schlegel, and C. Rensing. 2001. NreB from *Achromobacter xylosoxidans* 31A is a nickel-induced transporter conferring nickel resistance. *J. Bacteriol*. 183: 2803-2807.
13. Fan, B., G. Grass, C. Rensing, and B.P. Rosen. 2001. *Escherichia coli* CopA N-terminal $Cys(X)_2Cys$ motifs are not required for either copper resistance or transport. *Biochem. Biophys. Res. Commun*. 286: 414-418.
14. Grass, G. and C. Rensing. 2001. CueO is a multi-copper oxidase that confers copper tolerance in *Escherichia coli*. *Biochem. Biophys. Res. Commun.* 286: 902-908.
15. Grass, G., B. Fan, B.P. Rosen, S. Franke, D.H. Nies, and C. Rensing. 2001. ZitB (YbgR), a member of the Cation Diffusion Facilitator family, is an additional zinc transporter in *Escherichia coli*. *J. Bacteriol*. 183: 4664-4667.
16. Rensing, C., D.T. Newby, and I.L. Pepper. 2002. The role of selective pressure and selfish DNA in horizontal gene transfer and soil microbial community adaptation. *Soil Biol. Biochem*. 34: 285-296.
17. Grass, G., M.D. Wong, B.P. Rosen, R.L. Smith, and C. Rensing. 2002. ZupT is a Zn(II) uptake system in *Escherichia coli*. *J. Bacteriol*. 184: 864-866.
18. Roberts S.A., A. Weichsel, G. Grass, K. Thakali, J.T. Hazzard, G. Tollin, C. Rensing, and W.R. Montfort. 2002. Crystal structure and electron transfer kinetics of CueO, a multi-copper oxidase required for copper homeostasis in *Escherichia coli*. *Proc. Natl. Acad. Sci. USA* 99: 2766-2771.
19. Lee, S.M., G. Grass, C. Rensing, S.R. Barrett, C.J.D. Yates, J.V. Stoyanov, N.L. Brown. 2002. The Pco proteins are involved in periplasmic copper handling in *Escherichia coli*. *Biochem. Biophys. Res. Commun.* 295: 616-620.
20. Lee, S.M., G. Grass, C.J. Haney, B. Fan, B.P. Rosen, A. Anton, D.H. Nies, and C. Rensing. 2002. Functional analysis of the *Escherichia coli* zinc transporter ZitB. *FEMS Microbiol. Lett*. 215: 273-278.

21. Franke, S., G. Grass, C. Rensing and D.H. Nies. 2003. Molecular analysis of the copper-transporting efflux system CusCFBA from *Escherichia coli*. *J. Bacteriol*. 185: 3804-3812.
22. Rensing, C., and G. Grass. 2003. *Escherichia coli* mechanisms of copper homeostasis in a changing environment. *FEMS Microbiol. Rev*. 27: 197-213.
23. Baker, S., M. Herrchen, K. Hund-Rinke, W. Klein, W. Kördel, W. Peijnenburg and C. Rensing. 2003. Underlying issues including approaches and information needs in risk assessment. *Ecotoxicol. Environ. Safety*. 53: 6-19.
24. Rensing, C., and R.M. Maier. 2003. Issues underlying use of biosensors to measure metal bioavailability. *Ecotoxicol. Environ. Safety*. 53: 140-147.
25. Legatzki, A., G. Grass, A. Anton, C. Rensing, and D.H. Nies. 2003. Interplay of the Czc-system and two P-type ATPases in conferring metal resistance in *Ralstonia metallidurans*. *J. Bacteriol*. 185: 4354-4361.
26. Roberts S.A., G. F. Wildner, G. Grass, A. Weichsel, A. Ambrus, C. Rensing, and W.R. Montfort. 2003. A labile regulatory copper ion lies near the T1 copper site in the multicopper oxidase CueO. *J. Biol. Chem.* 278: 31958-31963.
27. Elliott, S.J., A.L. Bradley, A. Hooper, D. Arciero, W. Montfort, and C. Rensing. 2003. Of oxidases and peroxidases: new studies using protein voltammetry. *J. Inorg. Biochem.* 96: 127.
28. Wang, G., T.J. Gentry, G. Grass, K. Josephson, C. Rensing, and I.L. Pepper. 2004. Real-time PCR quantification of a GFP-labeled, genetically engineered *Pseudomonas putida* strain during 2-chlorobenzoate degradation in soil. *FEMS Microbiol. Lett*. 233: 307-314.
29. Wang, G., S.P. Kennedy, S. Fasiludeen, C. Rensing, and S. DasSarma. 2004. Arsenic resistance in *Halobacterium* sp. NRC-1 examined using an improved genetic knockout system*. J. Bacteriol*. 186: 3187-3194.
30. Gentry, T.J., C. Rensing, and I.L. Pepper. 2004. Advances in bioaugmentation research-new approaches may increase the utility of bioaugmentation as a remediation technology. *Crit. Rev. Env. Sci. Tec*. 34: 447-494.
31. Grass, G., K. Thakali, P.E. Klebba, D. Thieme, A. Müller, G.F. Wildner, and C. Rensing. 2004. Linkage between catecholate siderophores and the multi-copper oxidase CueO in *Escherichia coli*. *J. Bacteriol*. 186: 5826-5833.
32. Gentry, T.J., G. Wang, C. Rensing, and I.L. Pepper. 2004. Differential response of similar pristine soils to 2-, 3-, and 4-Chlorobenzoate contamination and phylogenetic characterization of resulting bacterial community dynamics. *Microb. Ecol*. 48: 90-102.
33. Anton, A., A. Weltrowski, C.J Haney, S. Franke, G. Grass, C. Rensing, and D.H. Nies. 2004. Characteristics of zinc transport by two bacterial cation diffusion facilitators from *Ralstonia metallidurans* and *Escherichia coli*. *J. Bacteriol.* 186: 7499-7507.
34. Singh, S.K., G. Grass, C. Rensing, and W.R. Montfort. 2004. Cuprous oxidase activity of CueO from *Escherichia coli*. *J. Bacteriol*. 186: 7815-7817.
35. Grass, G., M. Otto, B. Fricke, C.J., Haney, C. Rensing, D.H. Nies, and D. Munkelt. 2005. FieF (YiiP) from *Escherichia coli* mediates decreased cellular accumulation of iron and relieves iron stress. *Arch. Microbiol*. 183: 9-18.

36. Grass, G., S. Franke, N. Taudte, D.H. Nies, L.M. Kucharski, M.E. Maguire and C. Rensing. 2005. The metal permease ZupT from *Escherichia coli* is a transporter with a broad substrate spectrum. *J. Bacteriol*. 187: 1604-1611.
37. Astashkin, A.V., A.M. Raitsimring, A. Walker, C. Rensing, and M.M. McEvoy. 2005. Characterization of the copper(II) binding site in the pink copper binding protein CusF by electron paramagnetic resonance spectroscopy. *J. Biol. Inorg. Chem*. 10: 221-230.
38. Rensing, C. 2005. Form and function in metal-dependent transcriptional regulation: dawn of the enlightment. *J. Bacteriol*. 187: 3909-3912. Invited Guest Commentary.
39. Haney, C.J., G. Grass, S. Franke, and C. Rensing. 2005. New developments in functional understanding of the cation-diffusion-facilitator family. *J. Indust. Microbiol. Biotechnol*. 32: 215-226.
40. Loftin, R.I., S. Franke, A. Weichsel, S.A. Roberts, A. Heroux, W.R. Montfort, C. Rensing, and M.M. McEvoy. 2005. A novel copper-binding fold for the periplasmic copper resistance protein CusF. *Biochemistry* 44: 10533-10540.
41. Qin, J., B.P. Rosen, Y. Zhang, G. Wang, S. Franke, and C. Rensing. 2006. Arsenic detoxification and evolution of trimethylarsine gas by a microbial arsenite S-adenosylmethionine methyltransferase. *Proc. Natl. Acad. Sci. USA*. 103: 2075-2080.
42. Fan, H., D.J. Fairley, C. Rensing, I.L. Pepper, and G. Wang. 2006. Identification of similar non-thermophilic Crenarchaeota in four Chinese and American pristine soils. *Biodiversity Sciences.* 14: 181-187.
43. Kittleson, J.T., I.R. Loftin, A.C. Hausrath, K.P. Engelhardt, C. Rensing, and M.M. McEvoy. 2006. The periplasmic metal-resistance protein CusF exhibits high affinity and specificity for both Cu(I) and Ag(I). *Biochemistry*. 45: 11096-11102.
44. Fairley, D.J., G. Wang, I.L. Pepper, C. Rensing, and M.J. Larkin. 2006. Expression of genes involved in aromatic degradation in two haloarchaeal genera. *Appl. Microbiol. Biotechnol.* 73: 691-695.
45. Macomber, L., C. Rensing, and J.A. Imlay. 2007. Intracellular copper does not catalyze the formation of oxidative DNA damage in the model organism *Escherichia coli*. *J. Bacteriol*. 189: 1616-1626.
46. Brooks, J.P., S. Maxwell, C. Rensing, C.P. Gerba, and I.L. Pepper. 2007. Occurrence of antibiotic resistant bacteria and endotoxin associated with land application of biosolids. *Can. J. Microbiol*. 53: 616-622.
47. Quaranta, D., R. McCarty, V. Bandarian, and C. Rensing. 2007. The copper-inducible *cin* operon encodes an unusual methionine-rich azurin and a queuosine reductase in *Pseudomonas putida* KT 2440. *J. Bacteriol*. 189: 5361-5371.
48. Bagai, I., W. Liu, C. Rensing, N. J. Blackburn and M. McEvoy. 2007. Substrate-linked conformational change in the periplasmic component of a Cu(I)/Ag(I) efflux system. *J. Biol. Chem*. 282: 35695-35702.
49. Courville, P., E. Urbankova, C. Rensing, R. Chaloupka, M. Quick, and M. Cellier. 2008. Solute carrier 11 cation symport requires distinct residues in transmembrane helices 1 and 6. *J. Biol. Chem.* 283: 9651-9658.

50. Aguilar-Barajas, E., E. Paluscio, C. Cervantes, and C. Rensing. 2008. Functional expression of chromate-resistance genes from *Shewanella* sp. Strain ANA-3 in *Escherichia coli*. *FEMS Microbiol. Lett.* 285: 97-100.
51. Bagai, I., C. Rensing, N.J. Blackburn, and M.M. McEvoy. 2008. Direct metal transfer between periplasmic proteins identifies a bacterial copper chaperone. *Biochemistry*. 47: 11408-11414. Rated as "Exceptional" by Faculty of 1000.
52. Elguindi, J., J. Wagner, and C. Rensing. 2009. Genes involved in copper resistance influence survival of *Pseudomonas aeruginosa* on copper surfaces. *J. Appl. Microbiol*. 106: 1448-1455.
53. Cai, L., L. Guanghui, C. Rensing, and G. Wang. 2009. Genes involved in arsenic transformation and resistance associated with different levels of arsenic-contaminated soil. *BMC Microbiology*. 9: 4.
54. Cai, L., C. Rensing, L. Xiangyang, and G. Wang. 2009. Novel gene cluster involved in arsenite oxidation and resistance in *Achromobacter* sp. SY8 and *Pseudomonas* sp. TS44. *Appl. Microbiol. Biotech.* 83:715-725.
55. Quaranta, D., M.M. McEvoy, and C. Rensing. 2009. Site Directed Mutagenesis Identifies a Molecular Switch Involved in Copper Sensing by the Histidine Kinase CinS in *Pseudomonas putida* KT2440. *J. Bacteriol*. 16: 5304-5311.
56. Kim, E.H., X. Charpentier, O. Torres-Urquidy, M.M. McEvoy, and C. Rensing. 2009. The metal efflux island of *Legionella pneumophila* is not required for survival in macrophages and amoebas. *FEMS Microbiol. Lett*. 301: 164-170.
57. Coleman JJ, Rounsley SD, Rodriguez-Carres M, Kuo A, Wasmann CC, Grimwood J, Schmutz J, Taga M, White GJ, Zhou S, Schwartz DC, Freitag M, Ma LJ, Danchin EG, Henrissat B, Coutinho PM, Nelson DR, Straney D, Napoli CA, Barker BM, Gribskov M, Rep M, Kroken S, Molnár I, Rensing C, Kennell JC, Zamora J, Farman ML, Selker EU, Salamov A, Shapiro H, Pangilinan J, Lindquist E, Lamers C, Grigoriev IV, Geiser DM, Covert SF, Temporini E, Vanetten HD. 2009. *The genome of Nectria haematococca*: contribution of supernumerary chromosomes to gene expansion. *PLoS Genet*. 2009 Aug;5(8):e1000618.
58. Kim, E.H., C. Rensing, and M.M. McEvoy. 2010. Chaperone-mediated copper handling in the periplasm. *Nat. Prod. Rep*. 27: 711-719.
59. Conroy, O., E.H. Kim, M.M. McEvoy, and C. Rensing. 2010. Differing ability to transport non-metal substrates by two RND-type metal exporters. *FEMS Microbiol. Lett.* 380: 115-122.
60. He, M., X. Li, L. Guo, S.J. Miller, C. Rensing, and G. Wang. 2010. Characterization and genomic analysis of chromate-resistant and reducing strain *Bacillus* sp. SJ1. *BMC Microbiology*. 10: 221
61. He, M., X. Li, H. Liu, S.J. Miller, G. Wang, and C. Rensing. 2011. Characterization and genomic analysis of a highly chromate resistant and reducing bacterial strain *Lysinibacillus fusiformis* ZC1. *J. Hazard Mater*. 185: 682-688.
62. Elguindi, J., S. Moffitt, H. Hasman, C. Andrade, S. Raghavan, and C. Rensing. 2011. Significant differences in survival rates on copper surfaces between copper resistant gram-positive and gram-negative bacteria. *Appl. Microbiol*. *Biotech*. 89: 1963-1970.

63. Grass, G., C. Rensing, and M. Solioz. 2011. Metallic Copper as an Antimicrobial Surface. *Appl. Environ Microbiol*. 77: 1541-1547.
64. Mealman, T., I. Bagai, P. Singh, D. Goodlett, C. Rensing, H. Zhou, V. Wysocki, and M.M. McEvoy. 2011. Interactions between CusF and CusB identified by NMR spectroscopy and chemical cross-linking coupled to mass spectrometry. *Biochemistry*. 50: 2559-2566.
65. Kim, E.H., D.H. Nies, M.M. McEvoy and C. Rensing. 2011. Switch or Funnel: how RND-type transport systems control periplasmic metal homeostasis. *J. Bacteriol*. 193: 2381-2387.
66. Ramirez-Diaz, M., A. Diaz-Magana, V. Meza-Carmen, L. Johnstone, C. Cervantes, and C. Rensing. 2011. Nucleotide sequence of *Pseudomonas aeruginosa* conjugative plasmid pUM505 containing virulence and heavy metal resistance genes. *Plasmid*. 66: 7-18.
67. Elguindi, J., X. Hao, Y. Lin, H. A. Alwathnani, G.H. Wei, and C. Rensing. 2011. Advantages and challenges of increased antimicrobial copper use and copper mining. *Appl. Microbiol. Biotech*. 91: 237-249.
68. Xiong, J., H. Li, D. Li, M. He, S.J. Miller, L. Yu, C. Rensing, and G. Wang. 2011. Genome analysis and characterization of zinc efflux systems of a highly zinc-resistant bacterium*, Comamonas testosteroni* S44 *Res. Microbiol.* 162: 671-679.
69. Lin, Y., X. Hao, L. Johnstone, S.J. Miller, D.A. Baltrus, C. Rensing, G.H. Wei. 2011. Draft Genome of *Streptomyces zinciresistens* K42, a novel metal-resistant species isolated from copper-zinc mine tailings*. J. Bacteriol*. 193: 6408-6409.
70. Dupont, C.L., G. Grass, and C. Rensing. 2011. Copper toxicity and origin of bacterial resistance-new developments and applications. *Metallomics* 3: 1109-1118.
71. Singh, S.K., S.A. Roberts, S. Franke McDevitt, A. Weichsel, G.F. Wildner, G.B. Grass, C. Rensing, and W.R. Montfort. 2011. Crystal Structures of Multicopper Oxidase CueO Bound to Copper(I) and Silver(I): FUNCTIONAL ROLE OF A METHIONINE-RICH SEQUENCE. *J. Biol. Chem*. 286:37849-57.
72. Grass, G., L. Rensing, and C. Rensing. 2011. Metal Toxicity. *Metallomics* 3: 1095-1097.
73. Lin, Y., H. Fan, X. Hao, L. Johnstone, Y. Hu, G. Wei, H.A. Alwathnani, G. Wang and C. Rensing. 2012. Draft genome sequence of *Halomonas* sp. HAL1, a moderately halophilic arsenite oxidizing bacterium isolated from gold mine soil. *J. Bacteriol*. 194: 199-200.
74. Hao, X., Y. Lin, L. Johnstone, D.A. Baltrus, S.J. Miller, G. Wei, and C. Rensing. 2012. Draft genome sequence of plant growth promoting rhizobium *Mesorhizobium amorphae* isolated from zinc-lead tailings*. J. Bacteriol*. 194: 736-737.
75. Zhu, L., J. Elguindi, C. Rensing, and S. Ravishankar. 2012. Antimicrobial activity of different copper alloy surfaces against copper resistant and sensitive *Salmonella enterica*. *Food Microbiol*. 30: 303-310.

76. Wang, H., H. Li, Z. Shao, S. Ciao, L. Johnstone, C. Rensing, and G. Wang. 2012. Genome sequence of the deep-sea manganese-oxidizing bacterium *Marinobacter manganoxydans* Mn17-9. *J. Bacteriol.* 194: 899-900.
77. Hao, X., Y. Lin, L. Johnstone, G. Liu, G. Wang, G. Wei, T. McDermott, and C. Rensing. 2012. Genome sequence of the arsenite-oxidizing *Agrobacterium tumefaciens* 5A. *J. Bacteriol*. 194: 903.
78. Aguilar-Barajas, E., P. Jeronimo-Rodriguez, M.I. Ramirez-Diaz, C. Rensing, and C. Cervantes. 2012. The ChrA homologue from a sulfur-related gene cluster in cyanobacterial plasmid pANL confers chromate resistance. *World Journal of Microbiology and Biotechnology*. 28: 865-869.
79. Li, X., Y. Hu, J. Gong, Y. Lin, L. Johnstone, C. Rensing, and G. Wang. 2012. Genome sequence of the highly efficient arsenite-oxidizing bacterium *Achromobacter arsenitoxydans* SY8. *J. Bacteriol*. 194: 1243-1244.
80. Espirito Santo, C., Y. Lin, X. Hao, G. Wei, C. Rensing, and G. Grass. 2012. Draft genome sequence of *Pseudomonas psychrotolerans* L19, isolated from copper alloy coins. *J. Bacteriol*. 194: 1623-1624.
81. Huang, Y., H. Li, C. Rensing, K. Zhao, L. Johnstone, and G. Wang. 2012. Genome sequence of the facultative anaerobic arsenite-oxidizing and nitrate-reducing bacterium *Acidivorax* sp. Strain NO1. *J. Bacteriol.* 194: 1635-1636.
82. Kim, E.H., and C. Rensing. 2012. Genome of *Halomonas* strain GFAJ-1, a blueprint for fame or business as usual. *J. Bacteriol*. 194: 1643-1645.
83. Ye, J., C. Rensing, B.P. Rosen, and Y.G. Zhu. 2012. Arsenic biomethylation by photosynthetic organisms*. Trends in Plant Sci.* 17: 155-162.
84. Elguindi, J., H.A. Alwathnani, and C. Rensing. 2012. Rapid inactivaton and killing of *Cronobacter sakazakii* on copper alloys following periods of desiccation stress. *World Journal of Microbiology and Biotechnology*. 28: 1837-1841.
85. Gudipaty, S.A., A.S. Larsen, C. Rensing, and M.M. McEvoy. 2012. Regulation of Cu(I)/Ag(I) efflux genes in *Escherichia coli* by the sensor kinase CusS. *FEMS Microbiol. Lett*. 330: 30-37.
86. Liu, G., X. Li, W. Matty, B. Bothner, E.H. Kim, G. Wang, C. Rensing, and T.R. McDermott. 2012. An arsenite binding protein initiates sensing and signal transduction that regulates expression of the *aox* operon. *Env. Microbiol*. 14: 1624-1634.
87. Hao, X., P. Xie, L. Johnstone, S.J. Miller, C. Rensing, G. Wei. 2012. Genome sequence and mutational analysis of plant growth promoting bacterium *Agrobacterium tumefaciens* CCNWG0286 isolated from a zinc-lead mine tailing. *Appl. Environ. Microbiol*. 78: 5384-5394.
88. Kang, Y.S., B. Bothner, C. Rensing, and T.R. McDermott. 2012. Involvement of RpoN in regulating bacterial arsenite oxidation. *Appl. Environ. Microbiol*. 78: 5638-5645.
89. Li, X., J. Gong, Y. Hu, L. Cai, L. Johnstone, G. Grass, C. Rensing, and G. Wang. 2012. Genome sequence of moderately halotolerant, arsenite-oxidizing bacterium *Pseudomonas stutzeri* TS44. *J. Bacteriol*. 194: 4473-4474.
90. Wang, B., L.S. Pierson, C. Rensing, M.K. Gunatilaka, and C. Kennedy. 2012. NasT-mediated antitermination plays an essential role in the regulation of the

assimilatory nitrate reductase operon in *Azotobacter vinelandii*. *Appl. Environ. Microbiol*. 78: 6558-6567.
91. Kang, Y.S., J. Heinemann, B. Bothner, C. Rensing, and T.R. McDermott. 2012. Integrated co-regulation of bacterial arsenic and phosphorus metabolisms. *Env. Microbiol*. 14: 3097-3109.
92. Xie, W.Y., Q. Huang, G. Li, C. Rensing, and Y.G. Zhu. 2013. Cadmium accumulation in the rootless macrophyte *Wolffia globosa* and its potential for phytoremediation. *Int. J. Phytoremediation*. 15: 385-397.
93. Zhang, S., G. Sun, X. Yin, C. Rensing, and Y.G. Zhu. 2013. Biomethylation and volatilization of arsenic by the marine microalgae *Ostreococcus tauri. Chemosphere* 93: 47-53.
94. German, N., D. Doyscher, and C. Rensing. 2013. Bacterial killing in macrophages and amoeba. Do they all use a brass dagger? *Future Microbiol*. 8: 1249-1256.
95. Kalle, E., A. Gulevich, and C. Rensing. 2013 External and semi-internal controls for PCR amplification of homologous sequences in mixed templates. *J. Microbiol. Meth*. 95: 285-294.
96. Hao, X., S. Taghavi, P. Xie, M.J. Orbach, H.A. Alwathnani, C. Rensing, G. Wei. 2014. Phytoremediation of heavy and transition metals aided by legume-rhizobia symbiosis. *Int. J. Phytoremediation*. 16: 179-202.
97. Hao, X., P. Xie, O. Mohamad, C. Rensing, and G.H. Wei. 2013. Biosorption of copper and zinc by *Mesorhizobium amorphae* strain CCNWGS0123, kinetic and equilibrium studies. *Separ Sci Tech,* in press.
98. Singh, S.K., S.A. Roberts, J.T. Hazzard, S. Franke McDevitt, A. Weichsel, C. Rensing, and W.T. Montfort. 2013. CueO E506D mutant: crystal structure of the one-electron reduced native intermediate, kinetics, and impairment of product release. *Biochemistry*. Submitted.
99. Li, Z., Z. Ma, X. Hao, C. Rensing, and G.H. Wei. 2013. Genes conferring copper resistance in *Sinorhizobium meliloti* CCNWSX0020 also promote growth of *Medicago lupulina* in copper contaminated soil. *Appl. Environ. Microbiol*. Submitted.
100. Wang, B., C. Rensing, and C. Kennedy. 2013. The synthesis of antagonistic regulatory proteins NasS and NasT is coordinated by translational coupling in *Azotobacter vinelandii*. *Appl. Environ. Microbiol*. Submitted.
101. Li, H., Y. Huang, T. McDermott, G. Wang, and C. Rensing. 2013. Genomic analysis of arsenite oxidizing bacteria: new insights into regulation and metabolic integration of arsenic and phosphorus. *Frontiers in Microbial Chemistry*, submitted.

Book Chapters

1. Rensing, C., and B.P. Rosen. 2000. Transport of soft metals in prokaryotes. *In* Molecular Biology and Toxicology of Metals. Zalpus, R.K., and J. Koronpatnik, editors. Taylor and Francis, London. 129-149.
2. Rensing, C. and G. Grass, 2003, Efflux systems in metallophiles, *in* Extremophiles, edited by C. Gerday, *In* Encyclopedia of Life Support Systems (EOLSS), Eolss Publishers, Oxford, UK, [http://www.eolss.net]
3. Pepper, I.L., C. Rensing, and C.P. Gerba. 2004. Microbial properties and processes. *in* Environmental Monitoring. Eds. J. Artiola, I.L. Pepper, M. Brusseau. Academic Press, San Diego. 263-280.
4. Hasman, H., S. Franke, and C. Rensing. 2006. Resistance to metals used in agricultural production. *In* Antimicrobial Resistance in Bacteria of Animal Origin. Aarestrup, F.M., and H.C. Wegener, editors. ASM Press, Washington, D.C. 99-114.
5. Rensing, C., G. Grass, and I.L. Pepper. 2006. Genetically engineered crops and microbes. *In* Environmental and Pollution Science, Pepper, I.L., M.L. Brusseau, and C.P. Gerba. Academic Press/Elsevier, San Diego, CA. 489-498.
6. Rensing, C. and I.L. Pepper. 2006. Antibiotic resistant bacteria and gene transfer. *In* Environmental and Pollution Science, Pepper, I.L., M.L. Brusseau, and C.P. Gerba. Academic Press/Elsevier, San Diego, CA. 499-505.
7. Rensing, C. and S. Franke. 2007. Copper homeostasis in *Escherichia coli* and other Enterobacteriaceae. *In Escherichia coli* and *Salmonella typhimurium*. ASM Press, Washington, D.C. In press.
8. Franke, S. and C. Rensing. 2007. Acidophiles: mechanisms to tolerate metal and acid toxicity. *In* Physiology and Biochemistry of Extremophiles. Gerday, C., and N. Glansdorff, editors. ASM Press, Washington, D.C. 271-278.
9. Mitra, B. and C. Rensing. 2007. Zinc, cadmium and lead resistance and homeostasis. *In* Molecular Microbiology of heavy metals. Nies, D.H., and S. Silver, editors. Springer Verlag, Heidelberg. 321-341.
10. Roane, T., C. Rensing, and R.M. Maier. 2008. Microorganisms and metal pollutants. In Environmental Microbiology 2nd edition. Maier, R.M., I.L. Pepper, C.P. Gerba, editors. Elsevier, San Diego, CA. 421-441.
11. Rensing, C., and B.P. Rosen. 2009. Biogeocycles for redox-active metal(loids): As, Cu, Mn and Se *In* Encyclopedia of Microbiology, Third Edition, Moselio Schaechter**,** Editor-in-Chief. Elsevier, Oxford, UK. Vol. 3: 205-219.
12. Rensing, C., and S. Franke-McDevitt. 2013. The copper metallome in prokaryotic cells. *In* Metal Ions in Life Sciences, Vol 12: Metallomics and the Cell, Guest Editor: Lucia Banci. Springer Verlag, Heidelberg. 417-450.
13. Liu, Z., C. Rensing, and B.P. Rosen. 2013. Resistance pathways for metalloids and toxic metals. *In* Encyclopedia of Inorganic and Bioinorganic Chemistry, V. Culotta and R. Scott, editors, Wiley, Chichester, UK. 429-441.

Invited Scholarly Presentations

Seminars

1999 *Metal-transporting P-type ATPases*. Department of Nutritional Sciences, University of Missouri-Columbia.

2000 *Mechanisms of Metal Homeostasis in Prokaryotes*. Department of Genetics, University of Arizona.

2001 *Mechanisms of E. coli copper trafficking*. Department of Plant Pathology, University of California at Riverside. November 26th.

2002 *Copper and zinc homeostasis in Escherichia coli*. Queens University, Belfast, Northern Ireland. June 17th.

2003 *Mechanisms of copper homeostasis*. Department of Biology, University of California at San Diego. February 9th.

2003 *Copper handling in bacteria: mechanisms of homeostasis in a changing environment*. Max Planck Institute for Marine Microbiology, Bremen, Germany. July 24th.

2004 *Probing bacterial metal homeostasis at the molecular level*. Brookhaven National Laboratory, Upton, NY, June 28th.

2004 *New developments in bacterial copper and arsenite resistance*. Thermal Biology Institute at Montana State University, Bozeman, MT, October 4th.

2005 *E. coli copper homeostasis; evolutionary and structural perspectives*. Colorado State University, Fort Collins, CO, April 7th.

2005 *Linking microbial organic arsenic transformations into the global arsenic cycle* Thermal Biology Institute at Montana State University, Bozeman, MT, July 15th.

2005 *Novel developments in microbial-mediated arsenic transformations*. Center for Environmental Biotechnology at Arizona State University, Tempe, AZ, August 15th.

2005 *A novel arsenite resistance mechanism.* Department of Biology, Northern Arizona University, Flagstaff, AZ, September 26th.

2005 *Microbial handling and transformation of arsenic and copper*. Indiana University School of Medicine Northwest Campus, Gary, IN, November 1st.

2005 *Microbial handling and transformation of arsenic and copper*. University of Texas at Arlington, Arlington, TX, November 21st.

2005 *Microbial handling and transformation of arsenic*. University of Alaska at Fairbanks, Fairbanks, AK, December 8th.

2005 *Microbial handling and transformation of arsenic and copper*. University of Florida, Gainesville, FL, December 15th.

2006 *Microbial handling and transformation of arsenic*. Texas Tech, TX, February 8th.

2006 *Understanding the molecular genetics of the global arsenic cycle.* Brookhaven National Laboratory, Upton, NY, March 17th.

2006 *Understanding the molecular genetics of the global arsenic cycle.* University of California at Riverside, Riverside, CA, November 8th.

2006 *Understanding the molecular genetics of the global arsenic cycle.* University of Texas Pan American, Edinburg, TX, December 7th.

2007 *Keeping copper at arms length- rumble in the periplasmic jungle*. Georgia State University, Atlanta, GS, March 7th.

2007 *Keeping copper at arms length- rumble in the periplasmic jungle*. University of North Texas, Denton, TX, September 14th.

2007 *Love hurts: holding hands with copper.* University of California at Santa Cruz, Santa Cruz, CA, December 4th.

2008 *Love hurts: holding hands with copper.* University of Nebraska, Lincoln, NE, July 29th.

2009 *Love hurts: holding hands with copper.* North Carolina A & T State University, Greensboro, NC, October 7th.

2011 *Surprising twists in regulation of copper and arsenic metabolism*. Oregon Health and Science University. Portland, OR, February 11th.

2011 *Pumping iron and copper handling for a healthy future*. J. Craig Venter Institute, San Diego, CA, March 16th.

2011 *Controlling cellular copper concentrations for a healthy future*. Institute of the Urban Environment, Chinese Academy of Science, Xiamen, China, November 6th.

2012 *The little things matter: understanding metal-microbe interactions for a healthy future*. North Carolina State University, Raleigh, NC, January 19th.

2012 *Love hurts: bacterial handling of copper by the Cus system*. University of Southern California. Los Angeles, CA, January 31st.

2012 *The little things matter: understanding metal-microbe interactions for a healthy future*. Duke University, Durham, NC, February 21st.

2012 *Bacterial handling of copper: medical and environmental implications*. King Saud University, Riyadh, Saudi Arabia, March 20th.

2012 *Love hurts: bacterial handling of copper by the Cus system*. University of Åarhus, Åarhus, Denmark, November 20th.

2012 *Love hurts: bacterial handling of copper by the Cus system*. Queens University, Belfast, Northern Ireland, November 29th.

2013 *Careful handling of copper in* E. coli *ends with a twist*. Stavanger University, Stavanger, Norway, September 30th.

Symposia

2001 Invited participant at SGOMSEC (Scientific Group On Methodology for the Safety Evaluation of Chemicals) 15 workshop *Methodologies of assessing exposure to metals: speciation, bioaccessibility and bioavailability in the environment, food and feed* at the Fraunhofer Institut Schmallenberg/Germany

2004 Invited discussion leader and speaker at NSF/DOE-sponsored workshop entitled *Horizontal gene flow in microbial communities* in Warrenton, VA, June 14-16th.

Conferences

1998 *Zinc, cadmium and lead transport by members of the zinc group of the soft metal P-type ATPases*. Second International Symposium on Metals and Genetics, Toronto, Ontario.

2001 *Copper and zinc homeostasis in Escherichia coli*. Metals and Cells, Canterbury, England

2002 *CueO protects periplasmic enzymes from copper toxicity* at the 3rd international meeting on "Copper Homeostasis and its Disorders: Molecular and Cellular Aspects" October 4-8th, Ishia, Italy

2003 *Insights from the multi copper oxidase CueO and the Cus system on copper handling in the E. coli periplasm* at the Gordon Research Conference "Metals in Biology" February 2-7th, Ventura, CA.

2004 *Functional analysis of bacterial metal transporters important in phytoremediation* at the annual meeting of the Society of Industrial Microbiology, July 25-28th, Anaheim, CA.

2004 *Microbial Methylation of Arsenite* at the Superfund Annual Conference, November 3-4th. Seattle, WA.

2005 *Microbial methylation of Arsenic* at the annual meeting of the Society of Industrial Microbiology, August 21-25th, Chicago, IL.

2006 *Microbial handling and transformation of Arsenic* at the Gordon Research Conference "Metals in Biology" January 30th to February 3rd, Ventura, CA.

2006 *Microbial Arsenic Biomethylation: Its Possible Application in Rhizoremediation* at the Annual Symposium of the Southwest Consortium on Plant Genetics and Water Resources (SWC) August 24th to 26th, Las Cruces, NM.

2009 *Site Directed Mutagenesis Identifies a Molecular Switch Involved in Copper Sensing by the Histidine Kinase CinS in Pseudomonas putida KT2440* at the Wind River Conference in Estes Park, CO June 3-7.

Volunteered Scholarly Presentations

1. Rensing, C. and D. H Nies. The potential zinc-binding site of the CzcABC Cation Efflux Protein Complex of *Alcaligenes eutrophus* CH34. VAAM meeting, 1995. Stuttgart Germany.

2. Franke, S., G. Grass, C. Rensing, and D.H. Nies. Copper and silver resistance in *Escherichia coli*. VAAM meeting March 25-28, 2001; Oldenburg, Germany.

3. Lee, S.M., G. Grass, M. Eaton, and C. Rensing. Characterization of transporters involved in zinc homeostasis in *Escherichia coli*. ASM meeting May 19-23, 2002; Salt Lake City, Utah.

4. Totola, M.R., G. Grass, R.C.R. Fernandes, C. Rensing, and R.M. Maier. Rhamnolipid-GFP reporter constructs to use in studying regulation of rhamnolipid synthesis in *Pseudomonas aeruginosa*. ASM meeting May 19-23, 2002; Salt Lake City, Utah.

5. Gentry, T.J., G. Grass, C. Rensing, and I.L. Pepper. Development of a GFP-reporter system to detect pJP4 plasmid transfer in soil. ASM meeting May 19-23, 2002; Salt Lake City, Utah.

6. Grass, G., K. Thakali, and C. Rensing. Functional analysis of the multi copper oxidase CueO from *Escherichia coli*. ASM meeting May 19-23, 2002; Salt Lake City, Utah.

7. Roberts, S.A., A. Weichsel, G. Grass, K. Thakali, J.T. Hazzard, G. Tollin, C. Rensing, and W.R. Montfort. CueO, A multi-copper oxidase required for copper homeostasis in *E. coli*. American Crystallographic Association May 25-30, 2002; San Antonio, TX.

8. Franke, S., G. Grass, C. Rensing, and D.H. Nies. The small periplasmic protein CusF is necessary for full *cus*-dependent copper resistance in *E. coli*. VAAM meeting March 24-27, 2002; Göttingen, Germany.

9. Gentry, T.J., I.L. Pepper, G. Wang, and C. Rensing. Molecular ecology of chlorobenzoate degraders in soil: rationale for bioaugmentation. ASA meeting November 2-6, 2003; Denver, CO.

10. Fairley, D.J., M.J. Larkin, C.C.R. Allen, G. Wang, and C. Rensing. Aerobic metabolism of aromatic acids by extremely halophilic archaea. ASM meeting May 18-22, 2003; Washington, D.C.

11. Thakali, K., C. Rensing, and G. Grass. The multi-copper oxidase CueO is a connecting link between copper and iron homeostasis in *E. coli*. VAAM meeting March 23-26, 2003; Berlin, Germany.

12. Lee, S.M., A. Weltrowski, C. Rensing, and G. Grass. Functional analysis of the *Escherichia coli* zinc transporter ZitB, a member of the cation diffusion facilitator family. VAAM meeting March 23-26, 2003; Berlin, Germany.

13. Roberts, S.A., A. Weichsel, G. Grass, K. Thakali, J.T. Hazzard, G. Tollin, C. Rensing, and W.R. Montfort. CueO, A multi-copper oxidase required for copper homeostasis in *E. coli*. Protein Society, August 17-21, 2003; San Diego, CA.

14. Grass, G., C. Haney, C. Rensing, M. Otto, and D. Munkelt. Iron and zinc homeostasis mediated by the CDF-proteins of *E. coli*. VAAM meeting March 28-31, 2004; Braunschweig, Germany.

15. Lee, A., D.J., Fairley, M.J. Larkin, C.C.R. Allen, G. Wang, and C. Rensing. Biodegradation of Aromatic Compounds by Extremely Halophilic Microorganisms. Extremophiles September 19-23, 2004, Cambridge, MD.

16. Grass, G., S.K. Singh, W. Montfort, C. Rensing, and D.H. Nies. The multi-copper oxidase CueO from *E. coli* is a cuprous oxidase involved in copper and iron homeostasis. 4th International Meeting on "Copper Homeostasis and its Disorders: Molecular and Cellular Aspects", October 23-28, 2004, Ishia, Italy.

17. Franke, S., I. R. Loftin, J. Kittleson, I. Bagai, S.A. Roberts, A. Weichsel, A. Herox, W.R. Montfort, C. Rensing, and M.M. McEvoy. New developments in understanding the role of CusF in *cus* mediated copper resistance in *E. coli*. Gordon Research Conference, January 30 to February 3, 2006, Ventura, CA.

18. Courville, P., E. Urbankova, C. Rensing, R. Chaloupka, M. Quick, M. Cellier. Functional study of *Escherichia coli* proton-dependent manganese transport. 49th Annual Meeting and Conference of the Canadian Society of Biochemistry, Molecular and Cellular Biology, Niagara on the Lake, Ontario, Canada, May 31st – June 4th 2006

19. Loftin, I.R., S. Franke, A.C. Richie, J. Kittleson, N.J. Blackburn, C. Rensing, and M.M. McEvoy. A novel copper-binding fold for the periplasmic copper resistance protein CusF. Protein Society, August 5-9 2006; San Diego, CA.

20. Singh, S.K., S. Franke, R.A. Quick, S.L. Cheung, A. Weichsel, S.A. Roberts, Y. Zohar, C. Rensing, and W. R. Montfort. Solving multicopper oxidase reaction intermediate structures in CueO. 19th ACS Rocky Mountain Regional Meeting, October 14-18, 2006, Tucson, AZ.

21. Ravishankar, S., L. Zhu, and C. Rensing. Antibacterial effects of copper alloy surfaces on *Salmonella enterica*. Annual Meeting of the Institute of Food Technologists. June 28th – July 2nd 2008. New Orleans, LA.

22. Singh, S.K., S. Franke, J.T. Hazzard, A. Weichsel, S.A. Roberts, C. Rensing, and W.R. Montfort. 2008. Copper binding, oxidation and oxygen reduction in the multicopper oxidase CueO. Protein Society. July 19th-23rd 2008; San Diego, CA.

23. Conroy, O., M.M. McEvoy, and C. Rensing. Substrate Specificity of two RND Metal-transporting systems. Gordon Research Conference *Multi-Drug Efflux Systems*. March 22nd-27th 2009. Galveston, TX.

24. Kim, E. H., M.M. McEvoy, and C. Rensing. Guided by thioethers: the RND way out for copper and silver. Gordon Research Conference *Multi-Drug Efflux Systems*. March 22nd-27th 2009. Galveston, TX.

25. Elguindi, J., C. Andrade, H. Hasman, and C. Rensing. Significant differences in survival rates on copper surfaces between copper-resistant Gram-positive and Gram-negative bacteria. Tucson Nurses Week Foundation Conference and Healthy Fair, May 8th, 2009. Tucson, AZ.

26. He, M, C. Rensing, and G. Wang. Identification of ChrI, a potential chromate responsive regulator in the chromate-resistant and reducing *Bacillus cereus* strain SJ1. ASM General Meeting. May 23rd-29th 2010. San Diego, CA.

27. Elguindi, J., S. Moffitt, S. Raghavan, and C. Rensing. Copper surface alterations influence survival of copper-resistant *E. coli*. ASM General Meeting. May 23rd-29th 2010. San Diego, CA.

28. Kim, E.H., and C. Rensing. Guided by thioethers: the RND way out for copper and silver. ASM General Meeting. May 23rd-29th 2010. San Diego, CA.

29. Tores-Urquidy, O.H., C.P. Gerba, C. Rensing, and K. Bright. Overcoming reported copper resistance in bacterial strains using a combination of copper and silver ions. ASM General Meeting. May 23rd-29th 2010. San Diego, CA.

30. Elguindi, J.E., E. Fernandez, D. L. Carr, C. Rensing. Copper alloys effective in contact-killing of *Cronobacter sakazakii*. ASM General Meeting. May 2011 New Orleans, LA.

Research Grants and Contracts

1. Improving efficacy of various copper alloys toward various *Cronobacter* isolates and spores of *Clostridium perfringens* and *Bacillus cereus*. C. Rensing. International Copper Association. 2011-2013. $150,000

2. Molecular Mechanisms of Microbial Arsenite Sensing and Gene Regulation of Heterotrophic and Chemotrophic Arsenite-Oxidizing Bacteria. Major International

Joint Research Project of the Chinese National Natural Science Foundation. Gejiao Wang, C. Rensing, T. McDermott. $290,000. 1/1/2011-12/31/2013.

3. URM: Undergraduate Research and Mentoring at a Hispanic Serving Institution: Investigating a rare ecosystem. K. Lowe, T. DiChristina, A. Murphy, M. Perseans and C. Rensing. 2009-2013, NSF $768,552.

4. The Role of Protein Interactions in Microbial Copper/Silver Resistance. M. McEvoy and C. Rensing, 2007-2012, NIH $1,064,000.

5. ARRA Supplement to: The Role of Protein Interactions in Microbial Copper/Silver Resistance. M. McEvoy and C. Rensing, 5/1/10 to 4/30/11, $76,316.

6. Effectiveness of copper surfaces for disinfection of *Clostridium difficile* spores. C. Rensing. International Copper Association. 2010. $50,000.

7. Supplement to: The Role of Protein Interactions in Microbial Copper/Silver Resistance. M. McEvoy and C. Rensing. 7/1/2008 – 6/30/2010. $168,409.

8. Biotechnological Exploitation of Halotolerant Enzymes. C. Rensing and I.L. Pepper, 2004-2007, NSF, $150,000.

9. Antibiotic-resistant bacteria and endotoxins in association with land applications of biosolids. C. Rensing and Chuck Gerba 2003-2006, TRIF-WEDSP, $204,850.

10. Gene bioaugmentation of co-contaminated soils. I.L. Pepper and C. Rensing. 2000-2005, NIEHS Superfund, $604,720.

11. Regulatory networks of halophiles utilized for remediation of co-contaminated industrial effluents. C. Rensing and I.L. Pepper. 2002-2005, NSF WQC $150,000.

12. Supplement to: Regulatory networks of halophiles utilized for remediation of co-contaminated industrial effluents. C. Rensing and I.L. Pepper. 2004-2005, NSF WQC, $30,000.

13. Redox-mediated Copper Surface Killing of Bacteria and Yeasts. C. Rensing International Copper Association. 2009. $65,000.

14. Targets of copper surface toxicity. C. Rensing. International Copper Association. 2008. $45,000.

15. Mechanism of action. C. Rensing. International Copper Association. 2008. $65,000.

16. Survival of highly copper resistant pathogenic isolates on copper alloy surfaces. C. Rensing, Sadhana Ravishankar and Sylvia Franke. 2007-2008. International Copper Association. $75,000.

17. International Copper Association. C. Rensing. 2007. $10,000.

18. Bacterial methylation of arsenic. C. Rensing, 2005-2006, NIEHS Superfund, $20,000.

19. Distribution of arsenite oxidase in contaminated sites. C. Rensing, 2001-2002, NIEHS Superfund, $52,500.

20. BioMetals 2010 Conference. Megan McEvoy and C. Rensing. 2010-2011. NIEHS, $8000.

21. Determining the mechanisms of zinc uptake and efflux. C. Rensing, 2003-2004, University of Arizona, Faculty Small Grant Proposal, $ 8778.

22. Metal homeostasis in *Pseudomonas aureofaciens* and detection of bioavailable metal in the wheat rhizosphere. C. Rensing, 2000-2002, USDA Hatch, $5000 annually, 2003-2008 $800 annually.

23. Engineering specific metal transporters for phytoremediation. C. Rensing, 2005-2008, USDA Hatch, $800 annually.

24. Learner-Centered Education grant of the University of Arizona, C. Rensing 2006-2007, $750.

25 University of Arizona Foreign Travel Grant, C. Rensing, 2001. $550.

Extent of Teaching

<u>Courses Taught</u>

- Spring semester 2000: Pollution Science, SWES 305, Enrollment: 35, 50% effort, 3 units
- Spring semester 2001: Environmental Biotechnology, Enrollment: 10, 50% effort, 2 units
- Spring semester 2002: Environmental Biotechnology, Enrollment: 6, 100% effort, 2 units
- Fall semester 2003: Microbial Physiology, Enrollment: 45, 100% effort, 4 units
- Spring semester 2004: Environmental Biotechnology, Enrollment: 4, 100% effort, 2 units
- Fall semester 2004: Microbial Physiology, Enrollment: 48, 100% effort, 4 units
- Spring semester 2006: Environmental Biotechnology, Enrollment: 5, 100% effort, 2 units

- Spring semester 2007: Environmental Biotechnology, Enrollment: 1, 100% effort, 2 units
- Fall semester 2007: Molecular Biogeochemistry, Enrollment: 6, 50% effort, 2 units
- Spring semester 2008: Environmental Biotechnology, Enrollment: 2, 100% effort, 2 units
- Spring semester 2009: Environmental Biotechnology, Enrollment: 3, 100% effort, 2 units
- Fall semester 2009: Careers in Environmental Science, Enrollment: 50, 25% effort, 1 unit.
- Spring semester 2010: Microbial Genetics, Enrollment: 100, 100% effort 3 units
- Spring semester 2010: Microbial Genetics Lab, Enrollment: 81, 100% effort 2 units
- Spring semester 2013: Molecular Genetics, Enrollment: 65, 30% effort, 3 units

Individual Student Contact

Mentoring Activities

1. Postdoctoral advisees: 5
   - Gregor Grass (currently group leader at the Bundeswehr Hochschule, Germany)
   - Gejiao Wang (currently full professor at Huazhong Agricultural University, China)
   - Sylvia Franke (currently assistant professor at Skidmore College, NY)
   - Otakuye Conroy (currently assistant professor at the University of Utah, UT)
   - Yanbing Lin (currently assistant professor at Northwest A&F University, China)

2. Current Graduate advisees: 2
   - Xiuli Hao (PhD)
   - Benoush Ghodsalvi (PhD)

3. Thesis completed: 8
   - Christopher J. Haney (Ph.D.) (currently visiting assistant professor at Marist College, NY)
   - Sun Mi Lee (M.S.)
   - Davide Quaranta (Ph.D.) (currently postdoc at the University of Nebraska)
   - Yang Zhang (M.S.) (currently pharmacy student at the University of Wisconsin)
   - Minyan He (Ph.D.)
   - Dongmei Li (M.S.)
   - Eun-Hae Kim (Ph.D) (currently postdoc at the University of Arizona)
   - Jutta Elguindi (Ph.D.)

4. Dissertations in progress: 2

5. Service on Dissertation committees: 15
   - Jeff McQuaid (M.S.) completed

- Elizabeth Casarez (Ph.D.) completed
- Terry Gentry (Ph.D.) completed
- Kevin Drees (Ph.D.) completed
- Gerard White (Ph.D.) completed
- Benjamin Tanner (Ph.D.) completed
- John Brooks (Ph.D.) completed
- Sadie Iverson (M.S.) completed
- Ireena Bagai (Ph.D.) completed
- Baomin Wang (Ph.D.) completed
- Isabell R. Loftin (Ph.D.) completed
- Syreeta Miles (Ph.D.) completed
- Maria Rendon (Ph.D.) completed
- Swapna Aravind (Ph.D.) completed
- Diana Hernandez (Ph.D.) completed

6. Undergraduate advisees: 11
    - Kasheri Thakali (completed with honors; currently postdoc at the University of Arkansas)
    - Susheela Caroll (completed with honors; currently graduate student at UC Berkeley)
    - Poarche Hicks (UBRP)
    - Molly Engelhard (UBRP)
    - Chase Wadell
    - Christine Reeves (honors thesis)
    - Janine Wagner (German bachelor thesis)
    - Elyse Paluscio (MARC) (graduate student at Washington University, St. Louis, MO)
    - Jeniveve Reichert
    - Cassandra Andrade (MARC) (graduate student at the University of Wisconsin)
    - Danya Carroll
    - Demetrea Carr

7. Undergraduate Summer advisees: 5

    - Varma Rose (Widener University)
    - Shannon Brooks (North Carolina A&T State University)
    - Annette Negroni-Miranda (University of Puerto Rico at Cayey)
    - Whitney Gore (North Carolina A&T State University)
    - Lyndsey Reid (North Carolina A&T State University)

Awards to Advisees

2003 Award of a three-month BRAVO fellowship to do summer research at Queens University Belfast to Susheela Caroll.

2004 Award of a one-year postdoctoral fellowship from the DFG, an agency funding basic research in Germany to Sylvia Franke, a former postdoctoral fellow now assistant professor at Skidmore College.