

Caryl Ann Becerra

Department of Microbiology
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EDUCATION

- 2004–2010** University of Massachusetts, Amherst
Doctor of Philosophy in Microbiology
Dissertation Title: Role of Sulfate-Reducing Bacteria in the Attenuation of Acid Mine Drainage Through Sulfate and Iron Reduction
Dissertation Advisor: Klaus R. Nüsslein
- 2001–2003** California State University of Los Angeles
Master of Science in BioGeology
Thesis Title: Sediment Surface Area, Organic Carbon, and Chemical Fractionation of Sediments of Point Mugu, CA
Thesis Advisor: Crist S. Khachikian
- 1997–2001** Occidental College, Los Angeles, CA
Advanced Bachelor of Arts in Biochemistry and Environmental Science

SELECT HONORS AND AWARDS

- 9/10 to – 2/11:** Northeast Alliance for the Graduate Education and Professoriate (NEAGEP) Postdoctoral Fellowship
- 9/07 to 9/10:** Ford Foundation Pre-doctoral Fellowship
- 9/04 to 5/07:** CEA-CREST Bridges to the Ph.D. Fellowship
- 6/02 to 8/02:** International Agouron Geobiology Program
- 9/01 to 0/03:** CEA-CREST Graduate Fellowship
- 8/97 to 05/01:** Trustee Scholar, Occidental College, Los Angeles, CA.
- 8/97 to 5/01:** Navy-Marine Corps Relief VADM E. P. Travers Scholarship.
- 8/97 to 5/98:** American Petroleum Engineering Society, Ventura County, CA.
- 8/97 to 5/98:** Callens-Friedrich Educational Scholarship, Ventura County, CA.

RESEARCH EXPERIENCE

1/05 to 8/10: Research Assistant, Microbiology department, University of Massachusetts, Amherst.

Summary of role and accomplishment: directly instruct and advise Masters candidates on a daily basis, lead undergraduates in independent research projects; conducted dissertation project on evaluating the role of sulfate-reducing bacteria on the attenuation of AMD.

6/01 to 9/03: Research Assistant, Civil Engineering department, California State University of Los Angeles.

Summary of role and accomplishment: conducted environmental research on the relationship of organic carbon content and total sediment surface area for improvement of assessing metal contamination. Prof. Crist Khachikian, 5151 State University Drive, Engineering and Technology A212, Los Angeles, CA 90032.

6/99 to 6/01: Research Assistant in Geology, Occidental College.

Summary of role and accomplishment: geochemical study on the bioavailability of metal contaminants in sewage sludge and marsh sediment from Point Mugu Naval Air Station, CA using standard sequential extraction methods, operated ICP-AS, analyzed data, presented at SCCUR, and supervised three part-time lab assistants; Prof. James Sadd, Occidental College, 1600 Campus Drive, LA, CA 90042.

1/98-5/00: Undergraduate research assistant, Department of Chemistry, Occidental College.

Summary of role and accomplishment: synthesis and model study of Copper (II) tris (1-pyrazolyl) borate complexes; Prof. Michael Hill, Occidental College, 1600 Campus Drive, LA, CA 90042.

PUBLICATIONS

Becerra, C.A., E. Lopez-Luna, S.J. Ergas, K. Nüsslein, (2009). Microcosm-based study of the attenuation of an acid mine drainage-impacted site through biological sulfate and iron reduction, *Geomicrobiology*, **26**: 9-20.

Coggon, M., **C.A. Becerra**, K. Miller, R. Yuretich, K. Nüsslein, (2010). Bioavailability of jarosite as an electron acceptor in stimulating AMD attenuation, *Submitted*.

Becerra, C.A., B. Murphy, and K. Nüsslein, (2010). Attenuation of Acid Mine Drainage by Biogenic Sulfide-Mediated Iron Reduction, *Submitted*.

Barreto, C.C., **C.A. Becerra**, K.L. Forloney, K. Nüsslein, (2011). Prevalence of Acidobacteria in the attenuation of acid mine drainage in a long abandoned mining site, *Submitted*.

Becerra, C.A. and K. Nüsslein, (2010). Bacterial sulfate reduction in an acid mine drainage site, *in prep*.

Sengupta, A., **C.A. Becerra**, K. Nüsslein, D. Ahlfeld, (2010). Comparison of iron reduction rates in an acid mine drainage affected stream and hyporheic zone – a modeling and microcosms approach, *in prep.*

TEACHING EXPERIENCE

10/10: Guest Lecture in Hydrogeology Course, Amherst College.

04/09: Guest Lectures in Environmental Microbiology Course, University of Massachusetts, Amherst.

03/08: Guest Lecture in Microbiology Honors Colloquium, University of Massachusetts, Amherst.

12/07: Guest Lecture on “Environmental Microbiology” in General Microbiology Course, University of Massachusetts, Amherst.

9/04-12/04: Teaching Assistant in Pathogenic Bacteriology Lab Course, University of Massachusetts, Amherst.

ORAL PRESENTATIONS

Becerra, C.A. and K. Nüsslein, “Attenuation of Acid Mine Drainage by Sulfate-Reducing Bacteria,” Girguis Lab, OEB, Harvard University, invited, November 2009.

Becerra, C.A. and K. Nüsslein, “Attenuation of Acid Mine Drainage by Sulfate-Reducing Bacteria,” Ecology and Evolutionary Biology Dept., invited, University of California, Irvine, March 2009.

Becerra, C.A. and K. Nüsslein, “Attenuation of Acid Mine Drainage by Sulfate-Reducing Bacteria,” Microbiology Department Seminar, University of Massachusetts, Amherst, November 2008.

Becerra, C.A. and K. Nüsslein, “Attenuation of acid mine drainage by microbes,” Microbiology Department Seminar, University of Massachusetts, Amherst, May 2007.

Becerra, C.A., A. Sengupta, D.A. Ahlfeld, K. Nüsslein, “Natural attenuation of acid mine drainage by microbiological and hydrological processes at Davis Mine, Rowe, MA,” MA Water Resources Research Center, University of Massachusetts, Amherst, April 2007.

Becerra, C.A. and K. Nüsslein, “A microcosms study on the natural attenuation of acid mine drainage at Davis mine,” Microbiology Department Seminar, University of Massachusetts, Amherst, April 2006.

Becerra, C.A., E. Lopez-Luna, S. Ergas, and K. Nüsslein, “Natural attenuation of acid mine drainage simulated in microcosms of Davis mine, Rowe, Massachusetts,” SACNAS (Society for Advancement of Chicanos and Native Americans in Science) Annual National Conference, Denver, Colorado, peer-reviewed, September 2005.

Becerra, C.A. and C.S. Khachikian, "Bioavailability of Metals in Pt. Mugu Sediments," CEA-CREST Winter Series Seminar, California State University, Los Angeles, invited, February 2003.

Becerra, C.A., N.W. Wong, and C.S. Khachikian, "A study of sediment surface areas and organic carbon content;" Research and Creative Activity Symposium, California State University, Los Angeles, peer-reviewed, March 2002.

Becerra, C.A. and J. Sadd, "A geochemical study of toxic heavy metals suite," Southern California Conference of Undergraduate Research (SCCUR), California State University, Long Beach, peer-reviewed, November 2000.

POSTERS

Becerra, C.A. and K. Nüsslein, "Sulfate-reducing bacteria attenuate acid mine drainage," International Society of Microbial Ecology, Seattle, WA, peer-reviewed, August 2010.

Becerra, C.A. and K. Nüsslein, "Bacterial sulfate reduction at an acid mine drainage site," 109th Annual General Meeting of the American Society of Microbiology, Philadelphia, PA, peer-reviewed, May 2009.

Becerra, C.A. and K. Nüsslein, "Microbial sulfate reduction in the attenuation of acid mine drainage," 108th Annual General Meeting of the American Society of Microbiology, Boston, MA, peer-reviewed, June 2008.

Becerra, C.A. and K. Nüsslein, "Attenuation of acid mine drainage by microbes," New England Microbial Physiology, Ecology, and Taxonomy, June 2007

Becerra, C.A. and K. Nüsslein, "Visualization of sulfate-reducing bacteria in microcosms of an acid mine drainage site," SACNAS Annual National Conference, Tampa, Florida, peer-reviewed, October 2006.

Becerra, C.A. and K. Nüsslein, "Flask microcosm studies of microbial sulfate reduction contributing to the natural attenuation of acid mine drainage at Davis mine, Rowe, Massachusetts," 106th Annual General Meeting of the American Society of Microbiology, Orlando, Florida, peer-reviewed, May 2006.

Becerra, C.A., E. Lopez-Luna, S. Ergas, K. Nüsslein, "Natural attenuation of acid mine drainage from microcosms of Davis mine in Rowe, Massachusetts," The Annual International Conference on Soils, Sediments, and Water, University of Massachusetts, Amherst, peer-reviewed, October 2005.

Becerra, C.A., N.W. Wong, C.S. Khachikian, "Organic carbon content versus surface areas in Point Mugu Sediment," CEA-CREST Annual Conference, Los Angeles, California, May 2002.

Becerra, C.A., N.W. Wong and C.S. Khachikian, "Sediment surface area, organic carbon and metals fractionation in the sediment of Point Mugu, CA," Annual American Geophysical Union (AGU) Conference, San Francisco, peer-reviewed, December 2002.