David E. Cummings

Professor of Biology
Point Loma Nazarene University
3900 Lomaland Dr.
San Diego, CA 92106
Ph: (619) 849-2642
FX: (619) 849-2598
E-mail: davidcummings@pointloma.edu

EDUCATION AND TRAINING

- National Academies Education Fellow in the Life Sciences (2011-2012), for participation in the National Academies Summer Institute on Undergraduate Education in Biology, Evergreen State College, Olympia, WA.
- Post-doctoral fellowship, Idaho National Engineering and Environmental Laboratory, 2000-2002
- Ph.D. Microbiology, Molecular Biology, and Biochemistry, University of Idaho, 2000
- M.S. Zoology, University of Idaho, 1998
- B.A. English Literature, Point Loma Nazarene College, 1995

MENTORS

- Fredrick S. Colwell, post-doctoral mentor (Idaho National Laboratory)
- R. Frank Rosenzweig, M.S. advisor and Ph.D. (primary) co-advisor (University of Idaho)
- Donald L. Crawford, Ph.D. co-advisor (University of Idaho)

POSITIONS HELD

- 2010-present, Professor of Biology, Point Loma Nazarene University
- 2006-2010, Associate Professor of Biology, Point Loma Nazarene University
- 2004-2006, Assistant Professor of Biology, Point Loma Nazarene University
- 2002-2004, Principal Scientist, Idaho National Engineering and Environmental Laboratory
- 2000-2002, Post-doctoral fellow, Idaho National Engineering and Environmental Laboratory
- 1995-2000, Graduate student, University of Idaho

TEACHING EXPERIENCE

Southern Nazarene University

- Tropical Ecology and Sustainability (Microbial Ecology module), Quetzal Education Research Center (QERC), Costa Rica, Spring Break 2010, Spring Break 2012, Spring Break 2014

Point Loma Nazarene University

- Microbiology and Immunology (Bio660), graduate-level short course for MS students, lecture and lab, team taught with Dawne Page, Summer 2010
- Neotropical Ecology (Bio495), Biology and Environmental Science majors' course, lecture and field immersion, Spring 2009, Spring 2011, Spring 2013, Spring 2016
- Cell Biology and Biochemistry (Bio663), graduate-level short course for MS students, lecture and lab, Summer 2008
- Microbiology (Bio315), Biology majors' course, lecture and lab, every year
- Microbiology of Infectious Diseases (Bio220), service course for Nursing, Dietetics, and Exercise Science majors, lecture and lab, every semester
- Animal Biology lab (Bio215), Biology majors' course, Spring 2005
- Cell Biology and Biochemistry (Bio 210), Biology majors' course, lecture and lab, every year
- Environment and People (Bio102), general education elective, lecture only, every year until 2009

Idaho State University

- The Ecology of Microorganisms (BIO 424/524, Co-instructor with M. Shields, D. Newby, and F. Roberto), lecture only, Spring 2004

University of Idaho

- Graduate Assistant for Introductory Biology (BIO 100), Spring 1997
- Graduate Assistant for General Ecology (BIO 331), Fall 1996
- Graduate Assistant for General Biology (BIO 201), Fall 1995, Spring 1996

PLNU RESEARCH STUDENT MENTORING

Full-time summer researchers

Summer 2016: Samantha Hall, Lucas Ustick, Vicky Guzman, Sarah Pyle, Claudia Castilleja, Jacob Henderson

Summer 2015: Cierra Virtue, Chip La Chat, Kelly Davidson, Sam Hall, Lucas Ustick, Vicky Guzman

Summer 2014: Joy Walters, Ryan Echols, Cierra Virtue, Chip La Chat, Kelly Davidson

Summer 2013: Brooke Apffel, Tim Borgogna, Ryan Echols, Will Frye, Michal Hoenecke, Joy Walters

Summer 2012: Brooke Apffel, Tim Borgogna, Tori Haase, Michael Geiger, Michal Hoenecke

Summer 2011: Kim Espinosa, Michael Geiger, Tori Haase, Jenna Lavenuta, Doug Zuill

Summer 2010: Pieter Baker, Jenna Lavenuta, Kelly Pfeil, Doug Zuill
Summer 2009: Karisa Archer, Pieter Baker, Jonathan Laroya, Kelly Pfeil
Summer 2008: Karisa Archer, David Arriola, Jonathan Laroya, Cody Ryan, Kelsey Unruh
Summer 2007: David Arriola, Cody Ryan, Nathan Singh, Kelsey Unruh
Summer 2006: Amy Hebling, TJ Kopshy, Jason Kroening, Nathan Singh, Kelsey Unruh
Summer 2005: Amy Hebling, TJ Kopshy, Nathan Singh

BIO499 (Research in Biology) students
Spring 2015: Mary Ella Wood
Spring 2014: Monica Tingley, Alex Wicklund, Maritza Vick, Kaptan Kaster
Spring 2012: Weston Bennett, Tim Borgogna, Justin Hsu, Andrew Montano, Drew Sheldon
Fall 2011: Jenna Lavenuta
Spring 2011: Doug Zuill
Fall 2010: Jenna Lavenuta, Kelly Pfeil, Doug Zuill
Fall 2009: Kelly Pfeil
Spring 2008: David Arriola, Daniel Palmer
Spring 2007: Grace Faucett, Jason Kroening
Fall 2006: Grace Faucett, TJ Kopshy, Kelsey Unruh

Honors Scholars
AY2013-14: Tim Borgogna, Will Frye
AY2011-12: Doug Zuill
AY2010-11: Peter Gilson
AY2009-10: Karisa Archer, Pieter Baker
AY2008-09: David Arriola (won Samuel and Sussanah Wesley Best Honors Scholarship Award, 2009)

RECENT PRESENTATIONS (since 2004)

Cummings, D. E. 2014. Environmental reservoirs of drug-resistant bacteria. San Diego Zoo Institute for Conservation Research, San Diego, CA. (invited speaker)

Cummings, D. E. 2012. Environmental reservoirs of antibiotic resistance. Annual Meeting of the Southern California Academy of Sciences, Occidental College, Los Angeles, CA. (plenary speaker)

Cummings, D. E., K. F. Archer, P. A. Baker, K. G. Faucett, J. B. Laroya, K. L. Pfeil, C. R. Ryan, and K. R. Unruh. 2010. Plasmid-mediated quinolone resistance (PMQR) genes in a sewage-impacted coastal wetland. American Society for Microbiology, General Meeting, San Diego, CA. (poster)

Cummings, D. E., K. F. Archer, D. J. Arriola, P. A. Baker, K. G. Faucett, J. B. Laroya, K. L. Pfeil, C., R. Ryan, and K. R. Unruh. 2010. Antibiotic resistance genes as emerging contaminants in California's coastal environment. San Diego Microbiology Group meeting, Scripps Institute of Oceanography, San Diego, CA. (invited talk)

Cummings, D., D. Kerk, D. Sims, P. Richardson, B. Briggs, M. Swenson, and T. S. Magnuson. 2008. The *Acidiphilium cryptum* genome reveals capacities for metal transformation and mineral colonization. 16th Annual International Meeting on Microbial Genomics, Lake Arrowhead, CA. (poster)

Cummings, D. E., K. F. Archer, D. A. Arriola, J. B. Laroya, C. R. Ryan, N. J. Singh, and K. R. Unruh. 2008. "Antibiotic-resistant bacteria and antibiotic resistance genes in urban coastal wetlands." Montana State University, Bozeman, MT. (invited talk)

Cummings, D. E., K. F. Archer, D. A. Arriola, J. B. Laroya, C. R. Ryan, N. J. Singh, and K. R. Unruh. 2008. "Antibiotic-resistant bacteria in California's coastal wetlands." Upward Bound, San Diego, CA. (invited talk)

Cummings, D. E., K. F. Archer, D. A. Arriola, J. B. Laroya, C. R. Ryan, N. J. Singh, and K. R. Unruh. 2008. "Antibiotic-resistant bacteria in California's coastal wetlands." Tijuana Estuary Summer Speaker Series. San Diego, CA. (invited talk)

Cummings, D. E., D. A. Arriola, C. R. Ryan, N. J. Singh, and K. R. Unruh. 2007. "*Bacteria* – the wetland's most underappreciated members." Tijuana Estuary Summer Speaker Series. San Diego, CA. (invited talk)

Cummings, D. E., D. A. Arriola, C. R. Ryan, N. J. Singh, and K. R. Unruh. 2007. Microbiology at the Tijuana River Estuary. Loyola Marymount University, Los Angeles, CA. (invited talk)

Cummings, D. E., and D. Kerk. 2007. Analysis of the draft genome sequence of the acidophilic Fe(III)-reducing bacterium *Acidiphilium cryptum* JF-5 with respect to reduction of hexavalent chromium. American Society for Microbiology, General Meeting, Toronto, Canada. (poster)

Cummings, D. E., A. Hebling, T. J. Kopshy, N. J. Singh, and K. R. Unruh. 2006. "*Bacteria* – the wetland's most underappreciated members." Tijuana Estuary Summer Speaker Series. San Diego, CA. (invited talk)

Cummings, D. E., S. Fendorf, R. K. Sani, B. M. Peyton, and T. S. Magnuson. 2005. "Reduction of Cr(VI) under acidic conditions by the facultatively Fe(III)-reducing bacterium *Acidiphilium cryptum*." ISSM-ISEB Joint Symposium, Jackson, WY, oral.

PLNU STUDENT PRESENTATIONS

La Chat, Chip, Cierra Virtue, Joy Walters, Kelly Davidson, Ryan Echols, Michal Hoenecke, Victoria Haas, Jenna Mielke, Michael Geiger, Eva Top, Celeste Brown, Ryan Botts, and David Cummings. 2015. Genotypes and conferred phenotypes of four multi-drug resistance plasmids isolated from the natural environment. West Coast Biological Sciences Undergraduate Research Conference, Point Loma Nazarene University, San Diego, CA. (poster)

La Chat, Chip, Cierra Virtue, Joy Walters, Kelly Davidson, Ryan Echols, Michal Hoenecke, Victoria Haas, Jenna Mielke, Michael Geiger, Eva Top, Celeste Brown, Ryan Botts, and David Cummings. 2015. Genotypes and conferred phenotypes of four multi-drug resistance plasmids isolated from the natural environment. West Coast Biological Sciences Undergraduate Research Conference, Point Loma Nazarene University, San Diego, CA. (poster)

Borgogna, T. R., J.-L. Borgogna, J. A. Mielke, C. J. Brown, E. M. Top, R. T. Botts, and D. E. Cummings. 2014. Abundance and diversity of CTX-M extended-spectrum β-lactamases in urban wetlands and associated waste water treatment plants. General Meeting of the American Society for Microbiology, Boston, MA. (poster)

Frye, William, Ryan Botts, and David Cummings. 2014. Aminoglycoside resistance plasmids in *Pseudomonas* species isolated from the Tijuana River Estuary. West Coast Biological Sciences Undergraduate Research Conference, Azusa Pacific University, Azusa, CA. (oral presentation)

Borgogna, Timothy, Joanna-Lynn Borgogna, Matthieu Rouffet, Ryan Botts, and David Cummings. 2014. Detection and Quantification of CTX-M Extended-Spectrum β-lactamases in Urban Wetlands and Associated Waste Water Treatment Plants. Coast Biological Sciences Undergraduate Research Conference, Azusa Pacific University, Azusa, CA. (oral presentation)

Borgogna, Joanna-Lynn, Timothy Borgogna, Lori Carter, Ryan Botts, and David Cummings. 2014. Diversity, abundance, and persistence of antibiotic resistance genes in urban wetlands in San Diego County. West Coast Biological Sciences Undergraduate Research Conference, Azusa Pacific University, Azusa, CA. (poster presentation)

Collins, Brooke, Lori Carter, Ryan Botts, and David Cummings. 2014. The identification and annotation of novel plasmids carrying drug resistance from urban wetlands. Point Loma Nazarene University Honors Conference, San Diego, CA. (oral presentation)

Zuill, Doug. 2012. West Coast Biological Sciences Undergraduate Research Conference, Loyola Marymount University, Los Angeles, CA. (oral presentation)

Geiger, M., K. Schroeder, V. Haase, J. Lavenuta, D. Zuill, and D. Cummings. 2012. Self-transmissible antibiotic resistance plasmids in urban coastal wetlands. West Coast Biological

Sciences Undergraduate Research Conference, Loyola Marymount University, Los Angeles, CA. (poster)

Gilson, Peter, and David Cummings. 2011. Thermal ecology of a heat-sensitive, tropical montane lizard: *Norops pachypus*. West Coast Biological Sciences Undergraduate Research Conference, Tacoma, WA. (oral presentation)

Archer, Karisa, David Arriola, Pieter Baker, Grace Faucett, Jonathan Laroya, Jenna Lavenuta, Kelly Pfeil, Cody Ryan, Kelsey Ryan, Douglas Zuill, and David Cummings. 2011. Contamination of the urban coastal environment with plasmid-encoded antibiotic resistance genes. West Coast Biological Sciences Undergraduate Research Conference, Tacoma, WA. (poster)

Archer, Karisa F., David J. Arriola, Pieter A. Baker, Jonathan B. Laroya, Cody R. Ryan, Kelsey R. Unruh, Kelly L. Pfeil, and David E. Cummings. 2010. Spread of drug-resistance genes in a sewage-impacted coastal wetland. West Coast Biological Sciences Undergraduate Research Conference, Santa Clara, CA. (poster)

Unruh, K., D. Arriola, C. Ryan, J. Laroya, K. Archer, and David Cummings. 2009. The search for antibiotic-resistant bacteria in coastal wetlands using growth-based methods. West Coast Biological Sciences Undergraduate Research Conference, San Diego, CA. (oral presentation)

Archer, K. F., D. A. Arriola, J. B. Laroya, C. R. Ryan, N. J. Singh, K. R. Unruh, and D. E. Cummings. 2009. Investigation of antibiotic resistance genes in urban wetland sediments. West Coast Biological Sciences Undergraduate Research Conference, San Diego, CA. (oral presentation)

- Won Best Student Presentation, Microbiology

Arriola, D. A., K. F. Archer, J. B. Laroya, C. R. Ryan, N. J. Singh, K. R. Unruh, and D. E. Cummings. 2008. Antibiotic resistance genes in the metagenome of urban wetland sediments. 16th Annual International Meeting on Microbial Genomics, Lake Arrowhead, CA. (poster)

Unruh, K. R., C. Ryan, N. Singh, D. Arriola, and D. Cummings. 2008. The search for antibiotic-resistant bacteria in coastal wetlands using DNA-based and growth-based methods. West Coast Biological Sciences Undergraduate Research Conference, San Diego, CA. (poster)

Unruh, K. R., A. E. Hebling, S. Spring, and D. E. Cummings. 2007. Microbial diversity of native and Fe(III)-enriched consortia from the sediment-water interface of an estuarine coastal wetland. American Society for Microbiology, General Meeting, Toronto, Canada. (poster)

Unruh, K. R., A. E. Hebling, S. Spring, and D. E. Cummings. 2007. Microbial diversity of native and Fe(III)-enriched consortia from the sediment-water interface of an estuarine coastal wetland. West Coast Biological Sciences Undergraduate Research Conference, Los Angeles, CA. (poster)

Hebling, A., and D. E. Cummings. 2006. Exploratory research on Fe(III)-reducing bacteria in the sediments of the Tijuana Estuary. West Coast Biological Sciences Undergraduate Research Conference, San Diego, CA. (oral presentation)

Kopshy, T. J., and D. E. Cummings. 2006. Reduction of chromium (VI) by *Acidiphilium cryptum*. West Coast Biological Sciences Undergraduate Research Conference, San Diego, CA. (poster)

Singh, N., T. J. Kopshy, and D. E. Cummings. 2006. Evidence for enzymatic reduction of Cr(VI) by *Acidiphilium cryptum*. West Coast Biological Sciences Undergraduate Research Conference, San Diego, CA. (poster)

PUBLICATIONS

Borgogna, T. R., J.-L. Borgogna, J. A. Mielke, C. J. Brown, E. M. Top, R. T. Botts, and D. E. Cummings. 2016. High diversity of CTX-M extended-spectrum β-lactamases in municipal wastewater and urban wetlands. Microb. Drug Resist. 22:312-320.

Cummings, D. E., K. F. Archer, D. J. Arriola, P. A. Baker, K. G. Faucett, J. B. Laroya, K. L. Pfeil, C. R. Ryan, K. R. U. Ryan, and D. E. Zuill. 2011. Broad dissemination of plasmid-mediated quinolone resistance genes in sediments of two urban coastal wetlands. Environ. Sci. Technol. 45:447-454.

Magnuson, T. S., M. W. Swenson, A. J. Paszczynski, L. A. Deobald, D. Kerk, and D. E. Cummings. 2010. Proteogenomic and functional analysis of chromate reduction in *Acidiphilium cryptum* JF-5, an Fe(III)-respiring acidophile. BioMetals 23:1129-1138.

Cummings, D. E., A. E. Zimmerman, K. R. Unruh, and S. Spring. 2010. Influence of microbially reducible Fe(III) on the bacterial community structure of estuarine surface sediments. Geomicrobiol. J. 27:292-302.

Boyd, E. S., D. E. Cummings, and G. G. Geesey. 2007. Mineralogy influences structure and composition of bacterial communities associated with geological substrata in a pristine aquifer. Microb. Ecol. 54:170-182.

Cummings, D. E., S. Fendorf, N. Singh, R. K. Sani, B. M. Peyton, and T. S. Magnuson. 2007. Reduction of Cr(VI) under acidic conditions by the facultative Fe(III)-reducing bacterium *Acidiphilium cryptum*. Environ. Sci. Technol. **41:**146-152

Cummings, D. E., and T. S. Magnuson. 2007. Microbial Fe(III) reduction: ecological and physiological considerations. *In* Hurst, C. J., R. L. Crawford, G. R. Knudsen, M. J. McInerney, and L. D. Stetzenbach (eds.), Manual of Environmental Microbiology, 3rd edition. ASM Press, Washington, DC.

Macbeth, T. W., D. E. Cummings, S. Spring, L. M. Petzke, and K. S. Sorenson, Jr. 2004. Molecular characterization of a dechlorinating community resulting from *in situ* biostimulation in a trichloroethene-contaminated deep, fractured basalt aquifer and comparison to a derivative laboratory culture. Appl. Environ. Microbiol. **70**:7329-7341

Reardon, C. L., D. E. Cummings, L. M. Petzke, B. L. Kinsall, D. B. Watson, B. M. Peyton, and G. G. Geesey. 2004. Composition and diversity of microbial communities recovered from surrogate minerals incubated in an acidic uranium-contaminated aquifer. Appl. Environ. Microbiol. **70**:6037-6046

Cummings, D. E., O. L. Snoeyenbos-West, D. T. Newby, A. M. Niggemyer, D. R. Lovley, L. A. Achenbach, and R. F. Rosenzweig. 2003. Diversity of Geobacteraceae species inhabiting metal-polluted freshwater lake sediments ascertained by 16S rDNA analyses. Microb. Ecol. **46**:257-269

O'Connell, S. P., R. M. Lehman, O. Snoeyenbos-West , V. D. Winston , D. E. Cummings, M. E. Watwood, and F. S. Colwell. 2003. Detection of *Euryarchaeota* and *Crenarchaeota* in an oxic basalt aquifer. FEMS Microbiol. Ecol. **44**:165-173.

Cummings, D. E., S. Spring, and R. F. Rosenzweig. 2002. The ecology of iron-reducing bacteria in contaminated and pristine environments. *In* Hurst, C. J., R. L. Crawford, G. R. Knudsen, M. J. McInerney, and L. D. Stetzenbach (eds.), Manual of Environmental Microbiology, 2nd edition. ASM Press, Washington, DC.

Cummings, D. E., A. W. March, B. Bostick, S. Spring, F. Caccavo, Jr., S. Fendorf, and R. F. Rosenzweig. 2000. Evidence for microbial Fe(III) reduction in anoxic, mining-impacted lake sediments (Lake Coeur d'Alene, Idaho). Appl. Environ. Microbiol. **66:** 154-162.

Cummings, D. E., F. Caccavo, Jr., S. Spring, and R. F. Rosenzweig. 1999. *Ferribacterium limneticum*, gen. nov., sp. nov. an Fe(III)-reducing microorganism isolated from mining-impacted freshwater lake sediments. Arch. Microbiol. **171:** 183-188.

Cummings, D. E., F. Caccavo, Jr., S. Fendorf, and R. F. Rosenzweig. 1999. Arsenic mobilization by the dissimilatory Fe(III)-reducing bacterium *Shewanella alga* BrY. Environ. Sci. Technol. **33:** 723-729.

CURRENT RESEARCH SUPPORT

None.

PAST RESEARCH SUPPORT

National Institutes of Health (NIH). "Capture and Characterization of Self-Transmissible Plasmids from Urban Wetlands Encoding Clinically Relevant Antibiotic Resistance Genes." 5/2013 – 4/2016, $237,790 in direct costs. D. E. Cummings, R. T. Botts, and E. M. Top.

NOAA California Sea Grant Program. "Transferrable antibiotic resistance plasmids in urban coastal wetlands." $10,000. 2011. D. E. Cummings and E. M. Top.

PLNU Research and Special Projects (RASP). "Measuring the concentration of antibiotic resistance genes in polluted wetlands." $1,126. 2011. D. E. Cummings.

PLNU Alumni Association Research Award. "Triparental mating: research collaboration with the University of Idaho." $2,000. 2011. D. E. Cummings.

PLNU Wesleyan Center for 21st Century Studies. "Effects of tropical deforestation on *Norops* lizard behavior." $2,000. 2011. David E. Cummings and Peter Gilson*.

PLNU Research and Special Projects. "Special project: developing cross-disciplinary expertise in geographic information systems (GIS)." $600. 2009-2010. J. Byun and D. E. Cummings.

PLNU Research and Special Projects. "Antibiotic resistance genes in the Tijuana River Estuary." $2,000. 2008-2009.

NOAA California Sea Grant Program. "Program development: antibiotic resistance in the Tijuana River Estuary." $10,000. May – December 2008.

NOAA California Sea Grant Program. "Proof of concept: antibiotic resistance in coastal wetland sediments of urban/agricultural watersheds." $10,000. May – December 2007.

PLNU Wesleyan Center for 21st Century Studies. "The coastal wetland as a breeding ground for antibiotic resistance." $3,000. 2007-2008.

NSF Major Research Instrumentation Program. "Major instrumentation for undergraduate research and teaching at Point Loma Nazarene University." $213,740. D. M. Page and D. E. Cummings. AY06-08.

PLNU Alumni Association Teaching Development Award. "Development of a Relevant Laboratory Experience for Biology 315: Microbiology, a New Course to be Offered Annually Beginning Spring 2006." $2000. Spring 2006.

PLNU Research and Special Projects. "Microbial diversity in surface sediments of the Tijuana Estuary." $2,000. 2005-2006.

DOE Natural and Accelerated Bioremediation Research Program. "Comparative biochemistry and physiology of iron-respiring bacteria from acidic and neutral-pH environments." T. S. Magnuson and D. E. Cummings. FY04-FY06 $175k per year.

DOE INEEL Laboratory Directed Research and Development Program. "Characterizing microbial population shifts in response to alternative electron donors and their effect on trichloroethylene dechlorination efficiency." FY00-FY03, approx. $400k total.

DOE Environmental Systems Research and Analysis Program. "Abiotic constraints on microbial metal reduction." FY02 $285k, FY03 $94k, FY04 $60k. D. E. Cummings and F. S. Colwell.

Work for Others subcontract from Montana State University. "Construction of rDNA clone library." FY02 $17k, FY03 $39k, FY04 $75k.

Inland Northwest Research Alliance Program. "Selective attachment of dissimilatory metal-reducing bacteria to metal oxide substrata." FY03-05, $231k total. PI: T. S. Magnuson and D. E. Cummings.

Inland Northwest Research Alliance Program. "Characterization of inorganic precipitates formed on iron oxide mineral surfaces during colonization by dissimilatory iron-reducing and sulfate-reducing bacteria." FY03-FY05, $150k total. G. G. Geesey and D. E. Cummings.

SERVICES TO THE SCIENTIFIC COMMUNITY

- Co-moderator of conference session at ISSM-ISEB, 2005.
- Ph.D. graduate committee member for James Moberly, Montana State University, 2007-present. (dropped from committee prior to defense for logistical reasons)
- Ph.D. graduate committee member for Katie Reardon, Montana State University, 2002-2005.

- Manuscript reviewer for the journal *CLEAN – Soil, Air, Water*
- Manuscript reviewer for the journal *Applied and Environmental Microbiology*
- Manuscript reviewer for the journal *Aquaculture Research*
- Manuscript reviewer for the journal *Aquatic Sciences*
- Manuscript reviewer for the journal *Canadian Journal of Microbiology*
- Manuscript reviewer for the journal *Environmental Health Perspectives*
- Manuscript reviewer for the journal *Environmental Science and Technology*
- Manuscript reviewer for the journal *Geobiology*
- Manuscript reviewer for the journal *Geomicrobiology Journal*
- Manuscript reviewer for the journal *International Journal of Biotechnology*
- Manuscript reviewer for the journal *Water Research*
- Manuscript reviewer for the journal *Journal of Environmental Management*
- Manuscript reviewer for the journal *Journal of Hazardous Materials*
- Manuscript reviewer for the journal *Microbial Ecology*
- Proposal reviewer for the US-Israel Binational Agricultural Research and Development (BARD) Fund (2012)
- Proposal reviewer for the National Science Foundation.
- Proposal reviewer for the INEEL-LDRD Program.
- External reviewer for faculty tenure and promotion, Loyola Marymount University.

SERVICES TO THE UNIVERSITY

- Volunteer instructor for College Bound Summer Academy, June 2013
- Honors committee member for Trisha Stull, PLNU, AY 2011-2012
- Instructional Technology Committee, AY 2011-15 (chair in 2013-14)
- Honors committee chair for Doug Zuill, PLNU, AY 2011-2012
- Honors committee chair for Peter Gilson, PLNU, AY 2010-2011
- Honors committee chair for Pieter Baker, PLNU, AY 2009-2010
- Honors committee chair for Karisa Archer, PLNU, AY 2009-2010
- Honors committee member for Anthony Montano, PLNU, AY 2009-2010
- Honors committee member for Laura Knopp, PLNU, AY 2009-2010
- Spiritual Life Committee, AY 2008-2011
- Honors committee chair for David Arriola, PLNU, AY 2008-2009.
- Contributed two articles to the alumni magazine, *The Viewpoint*, Fall 2006.
- PLNU Resource Stewardship Taskforce, 2006-present.
- "Friend" of the PLNU Resource Stewardship Taskforce, 2004-2005.
- Honors committee member for Kristin Evanson, PLNU, AY 2005-2006.
- Honors committee member for Richard Trager, PLNU, AY 2004-2005.

PROFESSIONAL MEMBERSHIP

American Society for Microbiology, member since 1997