



# University of Colorado at Boulder

## College of Engineering and Applied Science

Department of Civil, Environmental, and Architectural Engineering  
1111 Engineering Drive, Room #441  
Campus Box: UCB 428  
Boulder, CO 80309-0428

Telephone: 503.784.4258 or 303.492.0139  
Facsimile: 303.492. 7317  
<http://www.linkedin.com/in/kevinmccabephd>  
email:Kevin.McCabe@colorado.edu

### *Curriculum Vitae*

## Kevin M. McCabe, Ph.D.

- Current Position:** Research Associate and Instructor  
Department of Civil, Environmental and Architectural Engineering  
University of Colorado, Boulder  
Boulder, Colorado  
Mentor: Mark Hernandez, Ph.D., P.E.
- Main Projects:** Effects of Aerosolization on *B. pertussis* on Viability and Gene Expression  
Microbiological Aspects and Health Effects of Aerosol from Oil Spill Impacted Shorelines in the Gulf Coast  
Identifying the Basic Molecular Biological Mechanism of Low-Energy Electric/Magnetic Field Effects
- Contact Information:** Email: [kevin.mccabe@colorado.edu](mailto:kevin.mccabe@colorado.edu)  
Webpages: <http://www.linkedin.com/in/kevinmccabephd>  
<http://stripe.colorado.edu/~hernando/>  
Phone: 503-784-4258 (mobile)  
303-492-0139 (lab)  
303-492-0755 (office)  
303-492-7317(FAX)  
Address: 1111Engineering Drive  
UCB Box 428  
Boulder, CO 80309
- Date and Place of Birth:** December 20, 1977; Denver, Colorado
- Citizenship:** United States of America

**Education:**

- 1996-2000 Johns Hopkins University, Baltimore, MD, (B.A. in Biology)
- 2000-2007 Oregon Health and Science University, Portland, OR (Ph.D. Molecular and Medical Genetics, Dr. Robb Moses, Advisor)
- 2007-Present University of Colorado at Boulder, College of Engineering and Applied Science (Postdoctoral Fellowship, Environmental Engineering, Mark Hernandez, PhD, PE, Advisor)

**Chronology of Employment:**

- 1990-1994 Volunteer Researcher, Institute for Molecular Genetics, Baylor College of Medicine, Houston, TX
- 1994-1997 Volunteer Researcher, Department of Pediatrics, University of California, Los Angeles, Los Angeles, CA
- 1997-2000 Student Researcher, Department of Biology, Johns Hopkins University, Baltimore, MD
- 2000-2007 Graduate Research Assistant, Department of Medical and Molecular Genetics, Oregon Health and Science University, Portland, OR
- 2007-Present Research Associate, Department of Civil, Environmental, and Architectural Engineering, College of Engineering and Applied Science, University of Colorado at Boulder, Boulder, CO
- 2008-Present Consultant, Environmental Forensics LLC. Boulder, CO
- 2009-Present Instructor, Department of Civil, Environmental, and Architectural Engineering, College of Engineering and Applied Science, University of Colorado at Boulder, Boulder, CO
- 2009-Present Graduate Faculty, Department of Civil, Environmental, and Architectural Engineering, College of Engineering and Applied Science, University of Colorado at Boulder, Boulder, CO

**Honors:**

- 1995, 1996 Western Student Medical Research Forum, Carmel, California. H.M. Pertorn Award for Presentation. One of top 10 presenters selected from 250 medical, graduate, college and high school students
- 1996 Society for Pediatric Research, Student Research Award (\$1,000 honorarium). One of two awards for outstanding research presented by medical, graduate, college and high school students at the SPR annual meeting.

- 1999            Howard Hughes Medical Institute Summer Research Fellowship (\$1500 Supplies/\$1500 Stipend), Johns Hopkins University, Department of Biology
- 2001-2002      Fanconi Anemia Research Foundation Grant Award (\$35,000), Functional studies of *Drosophila* FANCD2, OHSU, Department of Molecular & Medical Genetics
- 2002-2003      Molecular Hematology Training Grant, (One Year Graduate Fellowship and Stipend) Characterization of the *Drosophila* FANCD2 Homologue, OHSU, Department of Molecular & Medical Genetics

**Societies:**

American Society for Human Genetics  
 American Society for Microbiology  
 American Association for Aerosol Research

**Reviewer:**

Fertility and Sterility  
 Aerosol Science and Technology  
 Journal of Environmental Engineering

**Grants:**

- 2010-2011      RAPID 1049388, Co-Investigator Environmental Bioaerosol Generation and Potential Health Risks Associated with Hydrocarbon Weathering on Oil-Spill Impacted Shorelines (\$168,886) NSF Division of Industrial Innovation and Partnerships

**Other Activities:**

**Baylor College of Medicine**

(Concurrent with enrollment at River Oaks Elementary School, Pershing Middle School, and Bellaire High School, Houston, TX)

**Research Activities:**

- 1990-1992      Use of Database Search and Structural Prediction of the Query Sequence to Identify Functionally Significant Domains in Proteins with Sequence Similarity
- 1992            Use of Phylogenetic Sequence Similarity to Identify a Human Glycerol Facilitator Protein
- 1993-1996      Molecular Genetic Diagnosis of Bacterial Infections

**University of California, Los Angeles**

(Concurrent with enrollment at Crossroads School for the Arts and Sciences, Santa Monica, CA, and Johns Hopkins University, Baltimore, MD)

**Research Activities:**

1996-1998 Species Specific Identification of Bacterial Infections Following Universal Amplification

**Teaching Activities:**

1995-1996 Volunteer, Assisted Science Teacher, Palms Middle School, Los Angeles, CA

**Professional Activities:**

1998 Lead Technician, Department of Pediatrics DNA Sequencing and Synthesis Core

**Johns Hopkins University****Research Activities:**

1998-2000 Elucidation of the Protein-Protein Interactions of the Spindle Assembly Checkpoint in *Saccharomyces cerevisiae*

**Teaching Activities:**

1997-1998 Volunteer, Johns Hopkins University Tutoring Project

1998-2000 Volunteer, Junior Achievement Teaching Representative

1999 Mentor, Northern High School Basketball and Mentoring Program

**Oregon Health and Science University****Research Activities:**

2000-2003 Functional Studies of the *Drosophila* FANCD2 Homologue

2003-2007 Ordering Events in the Early Stages of Interstrand Crosslink Repair: Defining the Role of ERCC1 in the Processing of DNA Damage Upstream of the Fanconi Anemia Pathway

**Teaching Activities:**

2002-2004 Lecturer, Essentials of Medical Genetics Course, Teaching 1<sup>st</sup> year graduate students, as well as clinical fellows and Residents

2003 Presenter, Oregon Kids Judge Neuroscience Fair, Develop a manner in which to present a scientific topic to elementary school students, who will then judge the presentation

2005 Volunteer Judge, Regional Middle School Science Fair, R A Brown Middle School

2007 Volunteer Judge, Robert Gray Middle School Science Fair

**University of Colorado at Boulder**

**Research Activities:**

2007-Present Identifying the Basic Biological Mechanism of Low-Energy Electric/Magnetic Field Effects. Department of Civil, Environmental, & Architectural Engineering

2007-2009 Single-Pass Ultraviolet Inactivation of Bioaerosols. Department of Civil, Environmental, & Architectural Engineering

2008-Present Environmental Aerosol Sampling and Biomass Analysis for Indoor and Outdoor Air, Department of Civil, Environmental, & Architectural Engineering

2008-Present Aerosol Stress Effects on *B. pertussis* Survival and Gene Expression, Department of Civil, Environmental, & Architectural Engineering

2010-Present Examining Microbiological, Chemical, and Toxicological Aspects of Aerosol from Deepwater Horizon Oil Spill Impacted Shorelines. Environmental Forensics LLC. (In Collaboration with CU Boulder and Gulf Coast Region Historically Black Colleges and Universities)

2010-2011 Testing Bacterial Inactivation Rates of an Electrically Enhanced Filtration Unit, Department of Civil, Environmental, & Architectural Engineering

**Teaching Activities:**

2008-2009 Mentor to Kevin Ryan, Mechanical Engineering MS Student, Microbiology Laboratory Techniques and UV Inactivation

2008-2009 Mentor to Nick Clements, Mechanical Engineering BS/MS Student, Microbiology Laboratory Techniques and UV Inactivation

2008 Mentor to Keeley Hernandez, Summer Research Intern, Indoor Aerosol Sampling Campaign in Response to Flooding, Microscopic Enumeration, CFU and Molecular Phylogeny

2008 Mentor to Marcie Pullman, M.S., Summer Research Intern, Outdoor Aerosol Sampling and Biomolecule Speciation, Microbiology and Molecular Biology Laboratory Techniques, Environmental Engineering

2008 Mentor to Emily Sheehan, Environmental Engineering BS Student, Microbiology, Molecular Biology, Mammalian Cell Culture and Viral Assays and Laboratory Techniques

- 2008-2009 Mentor to Danielle Griego, Architectural Engineering BS/MS Student, Classic Microbiological Culture and Microscopy
- 2009-Present Appointment to the Graduate Faculty, College of Engineering and Applied Science, Dept of Civil, Environmental, and Architectural Engineering
- 2009-Present Mentor to Angela Uribe, Electrical Engineering BS Student, Classic Microbiological Culture and Microscopy, Electromagnetic Field Exposure
- 2009 Instructor, Introduction to Environmental Microbiology for Undergraduate and Graduate Environmental Engineering Students, CVEN 4484/5484, College of Engineering and Applied Science
- 2009 Participant in Faculty Teaching Excellence Program (FTEP), School of Engineering and Applied Sciences
- 2009 Attendee, Richard Felder 1.5 day Effective College Teaching Workshop
- 2009 Thesis Advisory Committee Member to Christie Chatterley, MS Candidate, (MS awarded June 2009) Environmental Engineering
- 2009 Mentor to Ivan Albino, SMART Student, Molecular Thermometry and Cloning, Environmental Engineering,
- 2009 Attendee FTEP Workshops on Interactive Teaching Techniques and Teaching Techniques in a Distance Learning Classroom
- 2009-Present Mentor to Jane Turner, Ph.D. Candidate, Environmental Engineering, Grant Writing, Laboratory and Environmental Microbiology, and Microscopy
- 2009-Present Mentor to Alison Ling, Ph.D. Candidate, Environmental Engineering, Laboratory and Environmental Microbiology, and Microscopy
- 2009-Present Guest Lecturer in Genetics to both Majors (BIO111) and Non-Majors (BIO105) Biology Courses at Front Range Community College, Boulder County Campus
- 2010 Co-developer of a pilot Maymester laboratory course to compliment the Environmental Microbiology Lecture (CVEN 4484/5484, Instructor of Record Spring 2009) which aims to incorporate group-based community and service learning to teach practical sampling, microscopic enumeration, culture and genetic techniques to undergraduate and graduate Environmental Engineering students.
- 2010-Present Guest Lecturer Introduction to Environmental Microbiology for Undergraduate and Graduate Environmental Engineering Students, CVEN 4484/5484, Department of Civil, Environmental, & Architectural Engineering
- 2010-Present Thesis Advisory Committee Member to Tom Zearley, PhD Candidate, (Expected

Completion Fall 2011) Environmental Engineering

2010 Co-Instructor, Freshman Engineering Projects (GEEN1400). A group-based, experiential learning course in which our students designed, built, and tested pilot scale, point of use water disinfection systems for developing communities. Integrated Teaching and Learning Labs

**Other Activities:**

2011 Invited Speaker, Astrobiology Seminar Series, "Reduction of the Earth's Geomagnetic Field Alters Growth Rates of Eukaryotic and Bacterial Cells." Department of Physics, University of Colorado at Boulder

**Bibliography** (*Citation number as of 8-13-11 According to Google Scholar; \* denotes undergraduate student contribution*)

**Refereed Publications:**

1. **KM McCabe**, Y-H Zhang, G Khan, E Mason, and ERB McCabe: Amplification of bacterial DNA using highly conserved sequences: Automated analysis and potential for molecular triage of sepsis. *Pediatrics*. 95:165-169, 1995. (*Cited by 60*)
2. **KM McCabe**, DA Wheeler, V Adams, and ERB McCabe: Role of structural information in identifying functionally significant domains in a protein database search: Comparison of human VDAC1 with streptococcal streptokinase and bovine BPI. *Biochemical and Molecular Medicine*. 56:176-179, 1996. (*Cited by 2*)
3. **KM McCabe**, Y-H Zhang, B-L Huang, EA Wager, and ERB McCabe: Bacterial species identification after DNA amplification with a universal primer pair. *Molecular Genetics and Metabolism*. 60:205-211, 1999. (*Cited by 53*)
4. **KM McCabe**, A Hemphill, Y Akkari, PM Jakobs, D Pauw, S Olson, RE Moses, M Grompe. ERCC1 is required for FANCD2 focus formation. *Molecular Genetics and Metabolism*, 95(1-2):66-73. 2008 (*Cited by 11*)
5. K Ryan, **KM McCabe**, N Clements\*, L Erickson, MT Hernandez, S Miller; Bioaerosol Inactivation of Airborne Microorganisms Using Novel Ultraviolet Radiation Sources in Reflective Flow-Through Control Devices. *Aerosol Science and Technology*, 44(7);541-550, 2010 (*Cited by 1*)
6. C Martino, L Portelli, **KM McCabe**, MT Hernandez, F Barnes. Static magnetic field sensitivity of endothelial cells. *Bioelectromagnetics*, 31(8); 649–655, 2010 (*Cited by 1*)
7. **KM McCabe**, EJ Lacherndo, I Albino-Flores\*, E Sheehan\*, MT Hernandez. LacI-*ts* regulated expression as an *in situ* intracellular biomolecular thermometer. *Applied Environmental Microbiology*, 77(9); 2863-2868, 2011

## Chapters and Reviews:

1. **KM McCabe** and ERB McCabe: Molecular genetic diagnosis of infectious disease. *Pediatric Annals*. 26:547-552, 1997. (Cited by 2)
2. **KM McCabe**, S Olson, RE Moses; DNA Interstrand Crosslink Repair in Mammalian Cells, *J of Cellular Physiol*, 220(3);569-73, 2009 (Cited by 15)
3. **KM McCabe**, MT Hernandez. Molecular Thermometry. *Pediatr Res*. 67(5); 469-475, 2010 (cited by 3)
4. **KM McCabe** *DNA Replication in Repair*. Working Title: "DNA Replication: Book II" ISBN 978-953-307-259-3 In press.

## Abstracts:

1. **KM McCabe**, G Khan, Y-H Zhang, EO Mason, and ERB McCabe: Amplification of DNA from multiple bacterial species using a single primer pair: Potential for molecular triage of sepsis. *Journal of Investigative Medicine*. 43:89A, 1995.
2. GB Khan, **KM McCabe**, EO Mason, JA Towbin, and ERB McCabe: PCR amplification of DNA from multiple bacterial species using a single primer pair: Potential for rapid diagnosis of meningitis and sepsis. *Pediatric Research*. 37:179A, 1995.
3. GB Khan, **KM McCabe**, JA Towbin, and ERB McCabe: A novel method for rapid diagnosis of bacterial meningitis using the polymerase chain reaction. Presented to the Society of Critical Care Medicine, New Orleans, Louisiana, February 5-9, 1996.
4. S-T Li\*, **KM McCabe** and ERB McCabe: Rapid blood sample preparation for bacterial DNA amplification. *Journal of Investigative Medicine*. 44:126A, 1996.
5. **KM McCabe**, Y-H Zhang, B-L Huang, S-T Li\*, G Khan, and ERB McCabe: Species specific identification of bacteria after amplification with a single primer pair complementary to highly conserved regions of 16S rDNA. *Journal of Investigative Medicine*. 44:126A, 1996.
6. **KM McCabe**, Y-H Zhang, B-L Huang, S-T Li\*, GB Khan, and ERB McCabe: Bacterial species identification after amplification with a universal primer pair. *Pediatric Research*. 39:1059A, 1996.
7. **KM McCabe**, C Clay, M Forte, M Grompe. Characterization of the *Drosophila fancd2* Homologue. Presented to the American Society of Human Genetics, October 2003, Los Angeles, CA.
8. **KM McCabe**, C Clay, M Forte, M Grompe. Characterization of the *Drosophila fancd2* Homologue, Presented to FASEB DNA Repair, July 2003, Snowmass, CO
9. **KM McCabe**, L Portelli, EA Sheehan\*, F Barnes, MT Hernandez. Genetics Based Intracellular



Thermometry Demonstrates Intracellular Heating Is Not Responsible For Low Energy Electromagnetic Field Bacterial Inactivation. Presented to the Bioelectromagnetics Society, June 2009, Davos, Switzerland

10. I Albino-Flores\*, L Portelli, EA Sheehan\*, F Barnes, **KM McCabe**, MT Hernandez. Intracellular Thermometry Using *lacI* Temperature-Sensitive Vectors with LacZ and EGFP Reporters. Presented to the Leadership Alliance National Symposium, August 2009, Washington, D.C.
11. AM Handorean, **KM McCabe**, A Ling, J Smith, C Weidenmeyer, MT Hernandez. Comparison of Protein and Carbohydrate Associations with Fine Particulate Matter in Sub-Alpine Aerosols from Pristine and Urban Environments. Presented to the American Assoc. Aerosol Res, Air Pollution and Health, March 2010, San Diego, CA
12. C Martino, **KM McCabe**, L Portelli, MT Hernandez, F Barnes. Reduction of the Earth's Magnetic Field Below Background Levels Inhibit Growth Rates of Cancer Cells. Presented to the Bioelectromagnetics Society Meetings, June 2010, Seoul, South Korea
13. L Lazo del Sol\*, L Portelli, **KM McCabe**, A Fordjour, MT Hernandez, F Barnes. The Effects of Low Strength Static Magnetic Fields on *E. coli*. Presented to the Leadership Alliance National Symposium, August 2010, East Brunswick, NJ
14. **KM McCabe**, J Turner, TL Nicholson, T Merkel, MT Hernandez. Hi-Fidelity RNA Recovery for the Expression Profiling of Airborne *Bordetella pertussis* Response to Atmospheric Environmental Stress. Presented to the American Association for Aerosol Research, October 2010, Portland, OR
15. **KM McCabe**, J Turner, T Merkel, MT Hernandez. Viability of aerosolized *Bordetella pertussis* and indications of gene level control of putative environmental survival factors. Presented to the American Association for Aerosol Research, October 2010, Portland, OR
16. AM Handorean, **KM McCabe**, A Ling, MT Hernandez. Seasonal Variations in Microbial Phylogeny and the Atmospheric Pools of Primary Biopolymers in Temperate Sub-Alpine Settings, Colorado USA. Presented to the American Association for Aerosol Research, October 2010, Portland, OR
17. J Turner, **KM McCabe**, MT Hernandez. Novel Paradigm for Bioaerosol Testing of Antimicrobial Textiles and Filter Material Based Disinfection. Presented to the American Association for Aerosol Research, October 2010, Portland, OR
18. **KM McCabe**, J Turner, TL Nicholson, MT Hernandez, and TJ Merkel Regulation and Role of the Aerosol Tolerance Genes of *B. pertussis*, Presented at the Pediatric Academic Society/Asian Society for Pediatric Research Joint Meetings, May 2010, Denver, CO
19. AM Handorean, **KM McCabe**, MT Hernandez, NR Pace, and MT Hernandez. Phylogenetic Analysis of Bioaerosols Recovered from Commercial Office Environments Reclaimed from

Flood Damage, Presented at International Society of Indoor Air Quality and Climate, June 2011, Austin, TX

20. LA Portelli, **KM McCabe**, D Garrido, E Shariati\*, L Lazo del Sol\*, MT Hernandez, and F Barnes. Shifts in the Ambient Magnetic Field Affect E. *Coli* DH5 growth rates. Bioelectromagnetics Society Meetings, June 2011, Halifax, NS, Canada

**References:**

Mark Hernandez, Ph.D., P.E., Professor of Civil and Environmental Engineering, University of Colorado at Boulder 1111 Engineering Drive, UCB Box 428, Boulder, CO 80309  
[mark.hernandez@colorado.edu](mailto:mark.hernandez@colorado.edu) 303-492-5991

Robb E. Moses, M.D., Professor and Chair Emeritus, Department of Molecular & Medical Genetics, OHSU Mail Code: L103 3181 SW Sam Jackson Park Road Portland, OR 97239  
[mosesr@ohsu.edu](mailto:mosesr@ohsu.edu) 503-494-6881, 503-970-7112

Tod J. Merkel, Ph.D. Laboratory of Respiratory and Special Pathogens, Food and Drug Administration, 8800 Rockville Pike Bethesda, MD 20892  
[tod.merkel@fda.hhs.gov](mailto:tod.merkel@fda.hhs.gov) (301) 496-5564

David Sadava, Ph.D., Professor Emeritus, Joint Sciences Department, Claremont Colleges, 19358 Wells Dr. Tarzana, CA 91356  
[dsadava@jsd.claremont.edu](mailto:dsadava@jsd.claremont.edu) 818-516-3853

Susan Olson, Ph.D., Professor, Department of Molecular & Medical Genetics, OHSU Mail Code: L103 3181 SW Sam Jackson Park Road Portland, OR 97239  
[olsonsu@ohsu.edu](mailto:olsonsu@ohsu.edu) 503-494-5964

De-Ann M. Pillers, M.D., Ph.D., Associate Chair for Research, Chief of Neonatology, Professor, Department of Pediatrics, University of Wisconsin-Madison 202 S Park St, Madison, WI 53715  
[pillersd@pediatrics.wisc.edu](mailto:pillersd@pediatrics.wisc.edu) 608-417-6236