

PETER C. RAYNOR

Work Address:

University of Minnesota
Division of Environmental Health Sciences
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St. Louis Park, Minnesota 55426
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Twitter: @PeterCRaynor

Teaching Interests: Industrial hygiene, Aerosol science, Air pollution, Air pollution control, Ventilation, Exposure assessment, Nanotechnology health and safety

Research Interests: Exposure control, Exposure assessment, Industrial hygiene, Air pollution, Hazardous substances, Air filtration, Ventilation, Nanotechnology health and safety, Personal protective equipment, Respiratory protection, Biological aerosols, Airborne viruses, Semi-volatile aerosols, Metalworking fluids, Aerosol physics

Employment:

Professor, with tenure, University of Minnesota, School of Public Health, Division of Environmental Health Sciences, June 2018 – present

Associate Professor, with tenure, University of Minnesota, School of Public Health, Division of Environmental Health Sciences, June 2010 – June 2018

Assistant Professor (tenure track), University of Minnesota, School of Public Health, Division of Environmental Health Sciences, July 2005 – June 2010

Assistant Professor (non-tenure track), University of Minnesota, School of Public Health, Division of Environmental Health Sciences, September 1998 – July 2005

Postdoctoral Research Associate, University of North Carolina at Chapel Hill, Department of Environmental Sciences and Engineering, May – July 1998

Sampled mists and fluid retained on mist collectors to determine conditions for which collection systems fail.

Consultant, 1994 – 1995, 2004 – present

Reviewed studies of candle filters for hot gas filtration. Assessed design of cyclone for pharmaceutical separation. Provided document and review for litigation on health effects of metalworking fluids. Performed performance testing of novel bedding material for infants.

Product Development Engineer, Eastman Kodak Company, July 1986 – July 1991

Received extensive training in imaging science. Designed product improvements for Ektacolor 2001 photographic paper. Worked on team that developed Vericolor 400 film. Led team that developed Ektapress Gold films.

Education:

Ph.D., University of North Carolina at Chapel Hill, Department of Environmental Sciences and Engineering, May 1998

Major: Air pollution control

Supporting program: Aerosol science

Dissertation: *Fates of Airborne Droplets Entering a Mist Filtration System*

Research: Designed test apparatus to measure processes that contribute to efficiency losses in fibrous filters wetted with oil. Developed model to describe performance of wetted filters.

M.S. in Environmental Engineering, University of North Carolina at Chapel Hill, Department of Environmental Sciences and Engineering, August 1993

Area of specialization: Air pollution control

Technical report: *An Evaluation of Oil Mist Removal by a Filtration Collector*

Research: Constructed test system for evaluating industrial-scale mist collection equipment. Studied evaporation and efficiency loss phenomena in mist collection systems.

B.S., with Distinction, Cornell University, School of Chemical Engineering, June 1986

Honors:

Fellow, American Industrial Hygiene Association, 2019

Charles N. Hewitt Creative Teaching Award, University of Minnesota School of Public Health, 2016

First author for paper that won 2012 Best Paper Award, *Journal of Occupational and Environmental Hygiene*, Michigan Industrial Hygiene Society, awarded 2013

David Swift Award for best aerosol paper in *Journal of Occupational and Environmental Hygiene* in 2010, awarded 2011

Best Presenter, PO 103: Sampling and Laboratory Analysis - Aerosols and Metals, American Industrial Hygiene Conference and Exposition, 2007

Faculty Excellence Award in Environmental Health from Environmental Health graduating class, University of Minnesota, 2001

Science to Achieve Results (STAR) Graduate Fellowship, United States Environmental Protection Agency, 1995-1998

Community Service Award from Durham-Orange County (NC) Medical Society, 1997

First author for paper that won 1996 Best Paper Award, *American Industrial Hygiene Association Journal*, Michigan Industrial Hygiene Society, awarded 1997

Board of Governors Fellowship in Science and Technology, University of North Carolina at Chapel Hill, 1993-1996

George C. Bunker Award for Outstanding Scholarship and Professional Promise in Environmental Engineering, University of North Carolina at Chapel Hill, 1993

Miriam L. Cole Scholarship, University of North Carolina School of Public Health, 1991

Cornell University Presidential Scholar, 1986

American Institute of Chemical Engineers Section Award for Scholastic Achievement, 1986

Memberships:

American Association for Aerosol Research (AAAR), 1994-present
American Industrial Hygiene Association (AIHA), 1998-present
Sigma Xi, 2002-present
Delta Omega, 2008-present
American Filtration and Separations Society (AFS), 1999-2005
American Conference of Governmental Industrial Hygienists (ACGIH), 1998-2003

Service:

International

- Reviewer, *Development of a procedure to measure the effectiveness of filters for capturing nanoparticles*, Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST), Project #0099-7920, 2011
- Reviewer, *Efficiency evaluation of N95 filters to capture ultrafine particles under cyclic and constant flows*, Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST), Project #2011-0035, 2014

National

- Member, AAAR Newsletter Committee, 2001-2004
- Chair, AAAR Newsletter Committee, 2003-2004
- Editor, *Particulars* (AAAR Newsletter), 2003-2004
- Member, AAAR Control Technology Working Group, 1998-2009
- Chair, AAAR Control Technology Working Group, 2000-2001
- Member, AAAR Indoor Air Working Group, 2006-present
- Member, AIHA Aerosol Technology Committee, 2001-present
- Chair, AIHA Aerosol Technology Committee, 2005
- Vice-Chair, AIHA Aerosol Technology Committee, 2004
- Secretary, AIHA Aerosol Technology Committee, 2003
- Member, AIHA Nanotechnology Working Group, 2006-present
- Member, AIHA Methamphetamine Working Group, 2006-2007
- Editorial Advisory Board, *Aerosol Science and Technology*, 2001-2010
- Proposal Reviewer, U.S. Department of Agriculture Small Business Innovation Research Program, 2003-2006
- Reviewer, *Response to Section 6102(e) of the Transportation Equity Act for the 21st Century*, U.S. Environmental Protection Agency report to Congress on PM_{2.5} Reference Method, 2000
- Member, Site Visit Review Team, New York/New Jersey Education and Research Center, National Institute for Occupational Safety and Health, 2010
- Editorial Board, *Safety and Health @Work*, 2013-present
- Member, P42 Superfund Research Program Review Committee, National Institute for Environmental Health Sciences, 2016
- International Advisory Board, *Annals of Work Exposures and Health*, 2017-present

- Member, Small Business: Instrumentation, Environmental, and Occupational Safety IMST(12)/MCST(12) Special Emphasis Panel, National Institutes of Health, March & November, 2022

State of Minnesota

- Enclosed Sports Arena Rules Advisory Committee, Minnesota Department of Health, 2010
- Clean Air Minnesota Working Group, Environmental Initiative, 2013-present

University of Minnesota

- Director, Industrial Hygiene Program, Midwest Center for Occupational Health and Safety, 2016-present
- Director, Pilot Projects Research Training Program, Midwest Center for Occupational Health and Safety, 2016-present
- Director, Hazardous Substances Academic Training Program, Midwest Center for Occupational Health and Safety, 2004-2012
- Technical Director, Hazardous Substances Training Continuing Education Program, Midwest Center for Occupational Health and Safety, 2007-2012
- Co-Technical Director, Hazardous Substances Training Continuing Education Program, Midwest Center for Occupational Health and Safety, 2004-2007
- PPE/Antiviral Stockpile Task Force, University of Minnesota Office of Emergency Response, 2009
- Animal Waste Management Work Team, University of Minnesota, 2008-2009
- Appointment, Promotion and Tenure Ad Hoc Review Committee, School of Public Health, 2007
- Recognition, Awards, and Honors Committee, School of Public Health, 1999-2000
- Laboratory Committee, Division of Environmental Health Sciences, 1998-2000, 2002-present
- Admissions Committee, Division of Environmental Health Sciences, 2000-2002, 2005-present
- Peer Review Committee, Academic Health Center Faculty Seed Grant Program, 2003
- Scientific Review Board, Midwest Center for Occupational Health and Safety Pilot Projects Research Training Program, 1999-2004, 2010-2016 (Chair, 1999-2001, 2004, 2012-2016)
- Search Committee for Health Educator (Education Specialist) Position, 2003
- Center for Filtration Research, 1999-present
- Member, Transportation Planning and the Environment Council, University of Minnesota Center for Transportation Studies, 2003-2006
- Appointment, Promotion and Tenure Ad Hoc Review Committee, School of Public Health, 2007
- Animal Waste Management Work Team, University of Minnesota, 2008-2009
- PPE/Antiviral Stockpile Task Force, University of Minnesota Office of Emergency Response, 2009
- Appointment, Promotion and Tenure Committee, School of Public Health, 2010-2014
- Doctoral Dissertation Fellowship Committee, School of Public Health, 2011
- Faculty Consultative Committee and Policy Council, School of Public Health, 2011-2014
- Reviewer, MnDRIVE Global Food Ventures Grant Proposals, 2014

- Participant, SPH Leads Leadership and Talent Development Program, 2016-2017
- Industrial Hygiene Faculty Position Search Committee, Chair, 2017-2018
- Exposure Science Faculty Position Search Committee, Member, 2017
- All-University Promotion and Tenure Committee, 2020-2023, Chair, 2022
- Industrial Hygiene Faculty Position Search Committee, Chair, 2022-2023

Manuscript Reviews

- *Aerosol Science and Technology*
- *Journal of Aerosol Science*
- *Journal of Occupational and Environmental Hygiene*
- *Annals of Work Exposure and Health*
- *American Industrial Hygiene Association Journal*
- *Applied Occupational and Environmental Hygiene*
- *Annals of Occupational Hygiene*
- *Industrial and Engineering Chemistry Research*
- *Journal of Porous Media*
- *Journal of Colloid and Interface Science*
- *American Journal of Infection Control*
- *CLEAN -- Soil, Air, Water*
- *Chemical Engineering Research and Design*
- *Atmospheric Environment*
- *Critical Reviews in Environmental Science and Technology*
- *Environmental Science and Technology*
- *Safety and Health @ Work*
- *Indoor Air*
- *Aerosol and Air Quality Research*
- *International Journal of Risk Assessment and Management*
- *Journal of Agromedicine*

Teaching:

Participant, University of Minnesota Early Career Teaching Program, 2002-2003

University of Minnesota

Co-Lead instructor, PubH 6175 (Environmental Measurements Laboratory), Spring 2024
Lead instructor, PubH 6192 (Measurement and Properties of Air Contaminants), Fall 2023
Lead instructor, PubH 6174 (Control of Workplace Exposure), Spring 2023
Lead instructor, PubH 6173 (Exposure to Physical Agents), Fall 2022
Lead instructor, PubH 6175 (Environmental Measurements Laboratory), Spring 2022
Lead instructor, PubH 6192 (Measurement and Properties of Air Contaminants), Fall 2021
Lead instructor, PubH 6174 (Control of Workplace Exposure), Spring 2021
Lead instructor, PubH 6177 (Nanotechnology Health & Safety), Fall 2020
Lead instructor, PubH 6173 (Exposure to Physical Agents), Spring 2020
Guest instructor, PubH 6170 (Introduction to Occupational Health and Safety), Fall 2019
Lead instructor, PubH 6174 (Control of Workplace Exposure), Spring 2019

Lead instructor, PubH 6177 (Nanotechnology Health & Safety), Fall 2018
Guest instructor, PubH 6170 (Introduction to Occupational Health and Safety), Fall 2018
Lead instructor, PubH 6173 (Exposure to Physical Agents), Spring 2018
Co-Lead instructor, PubH 6175 (Environmental Measurements Laboratory), Spring 2018
Guest instructor, PubH 6170 (Introduction to Occupational Health and Safety), Fall 2017
Lead instructor, PubH 6192 (Measurement and Properties of Air Contaminants), Fall 2017
Lead instructor, PubH 6100 (Nanotechnology Health & Safety), Spring 2017
Lead instructor, PubH 6174 (Control of Workplace Exposure), Spring 2017
Guest instructor, PubH 6170 (Introduction to Occupational Health and Safety), Fall 2016
Lead instructor, PubH 6103 (Exposure to Environmental Hazards), Fall 2016
Lead instructor, PubH 6100 (Nanotechnology Health & Safety), Spring 2016
Lead instructor, PubH 6173 (Exposure to Physical Agents), Spring 2016
Guest instructor, PubH 6170 (Introduction to Occupational Health and Safety), Fall 2015
Lead instructor, PubH 6103 (Exposure to Environmental Hazards), Fall 2015
Lead instructor, PubH 6174 (Control of Workplace Exposure), Spring 2015
Guest instructor, PubH 6170 (Introduction to Occupational Health and Safety), Fall 2014
Lead instructor, PubH 6103 (Exposure to Environmental Hazards), Fall 2014
Lead instructor, PubH 6173 (Exposure to Physical Agents), Spring 2014
Guest instructor, PubH 6170 (Introduction to Occupational Health and Safety), Fall 2013
Lead instructor, PubH 6103 (Exposure to Environmental Hazards), Fall 2013
Lead instructor, PubH 6174 (Control of Workplace Exposure), Spring 2013
Guest instructor, PubH 6170 (Introduction to Occupational Health and Safety), Fall 2012
Lead Instructor, PubH 6103 (Exposure to Environmental Hazards), Fall 2012
Co-Lead instructor, PubH 6175 (Environmental Measurements Laboratory), Spring 2012
Co-Lead instructor, PubH 6173 (Exposure to Physical Agents), Spring 2012
Guest instructor, PubH 6170 (Introduction to Occupational Health and Safety), Fall 2011
Lead Instructor, PubH 6103 (Exposure to Environmental Hazards), Fall 2011
Lead instructor, PubH 6174 (Control of Workplace Exposure), Spring 2011
Co-Lead instructor, PubH 6175 (Environmental Measurements Laboratory), Spring 2011
Guest instructor, PubH 6170 (Introduction to Occupational Health and Safety), Fall 2010
Lead Instructor, PubH 6103 (Exposure to Environmental Hazards), Fall 2010
Lead instructor, PubH 6173 (Exposure to Physical Agents), Spring 2010
Guest instructor, PubH 6170 (Introduction to Occupational Health and Safety), Fall 2009
Co-Lead Instructor, PubH 6103 (Exposure to Environmental Hazards), Fall 2009
Lead instructor, PubH 6174 (Control of Workplace Exposure), Spring 2009
Co-Lead instructor, PubH 6175 (Environmental Measurements Laboratory), Spring 2009
Guest instructor, PubH 6170 (Introduction to Occupational Health and Safety), Fall 2008
Co-Lead Instructor, PubH 6103 (Exposure to Environmental Hazards), Fall 2008
Lead Instructor, PubH 7220 (Personal Protective Equipment and Respiratory Protection), Public Health Institute, Summer 2008
Lead instructor, PubH 6173 (Exposure to Physical Agents), Spring 2008
Guest instructor, PubH 6170 (Introduction to Occupational Health and Safety), Fall 2007
Co-Lead Instructor, PubH 6103 (Exposure to Environmental Hazards), Fall 2007
Lead Instructor, PubH 7200 (Personal Protective Equipment and Respiratory Protection), Public Health Institute, Summer 2007

Lead Instructor, PubH 7200 (Workers as Partners in Emergency Preparedness and Response), Public Health Institute, Summer 2007

Lead instructor, PubH 6174 (Control of Workplace Exposure), Spring 2007

Co-Lead instructor, PubH 6175 (Industrial Hygiene Measurements Laboratory), Spring 2007

Co-Lead Instructor, PubH 6103 (Exposure to Environmental Hazards), Fall 2006

Lead Instructor, PubH 7200-128 (Personal Protective Equipment and Respiratory Protection), Public Health Institute, Summer 2006

Lead Instructor, PubH 7200-129 (Preparedness for Buildings), Public Health Institute, Summer 2006

Lead Instructor, PubH 7200-133 (Workers as Partners in Emergency Preparedness and Response), Public Health Institute, Summer 2006

Lead instructor, PubH 6173 (Exposure to Physical Agents), Spring 2006

Co-Lead instructor, PubH 6175 (Industrial Hygiene Measurements Laboratory), Spring 2006

Co-instructor, PubH 6103 (Exposure to Environmental Hazards), Fall 2005

Guest instructor, PubH 6170 (Introduction to Occupational Health and Safety), Fall 2005

Lead Instructor, PubH 7200-114 (Personal Protective Equipment and Respiratory Protection), Public Health Institute, Summer 2005

Lead Instructor, PubH 7200-116 (Workers as Partners in Emergency Response), Public Health Institute, Summer 2005

Lead instructor, PubH 5174 (Control of Exposure to Physical and Chemical Hazards), Spring 2005

Co-instructor, PubH 5175 (Industrial Hygiene Measurements Laboratory), Spring 2005

Co-instructor, PubH 5103 (Exposure to Environmental Hazards), Fall 2004

Lead instructor, PubH 5174 (Control of Exposure to Physical and Chemical Hazards), Spring 2004

Co-instructor, PubH 5175 (Industrial Hygiene Measurements Laboratory), Spring 2004

Co-instructor, PubH 5103 (Exposure to Environmental Hazards), Fall 2003

Guest instructor, PubH 5170 (Introduction to Occupational Health and Safety), Fall 2003

Co-instructor, PubH 5103 (Exposure to Environmental Hazards), Public Health Institute 2003

Lead instructor, PubH 5174 (Control of Exposure to Physical and Chemical Hazards), Spring 2003

Co-instructor, PubH 5175 (Industrial Hygiene Measurements Laboratory), Spring 2003

Co-instructor, PubH 5103 (Exposure to Environmental Hazards), Fall 2002

Guest instructor, PubH 5170 (Introduction to Occupational Health and Safety), Fall 2002

Lead instructor, PubH 5174 (Control of Exposure to Physical and Chemical Hazards), Spring 2002

Co-instructor, PubH 5175 (Industrial Hygiene Measurements Laboratory), Spring 2002

Co-instructor, PubH 5103 (Exposure to Environmental Hazards), Fall 2001

Co-instructor, PubH 5103 (Exposure to Environmental Hazards), Fall 2000

Lead instructor, PubH 5174 (Control of Exposure to Physical and Chemical Hazards), Spring 2000

Co-instructor, PubH 5175 (Industrial Hygiene Measurements Laboratory), Spring 2000

Co-instructor, PubH 5103 (Exposure to Environmental Hazards), Fall 1999

Co-instructor, PubH 5184 (Measurement of Airborne Contaminants), Winter 1999

Co-instructor, PubH 5216 (Properties & Behavior of Workplace Airborne Contaminants), Fall 1998

University of Minnesota Continuing Education On-line Modules

Instructor, "Chemical Hazard Awareness for Public Health Workers", URL:

<http://learning.umn.edu/search/publicCourseSearchDetails.do?method=load&courseId=5298080&selectedProgramAreaId=18870&selectedProgramStreamId=18876>

Instructor, "Radiological Hazard Awareness for Public Health Workers", URL:

<http://learning.umn.edu/search/publicCourseSearchDetails.do?method=load&courseId=5210570&selectedProgramAreaId=18870&selectedProgramStreamId=18876>

Instructor, "Introduction to Occupational Hygiene: Occupational Hygiene Principles", URL:

<http://learning.umn.edu/search/publicCourseSearchDetails.do?method=load&courseId=3289918&selectedProgramAreaId=18870&selectedProgramStreamId=18876>

Instructor, "Nanotechnology Health and Safety: Introduction to Nanotechnology", URL:

<http://learning.umn.edu/search/publicCourseSearchDetails.do?method=load&courseId=5421848&selectedProgramAreaId=18870&selectedProgramStreamId=18876>

Instructor, "Nanotechnology Health and Safety: Exposures to Raw Nanomaterials", URL:

<http://learning.umn.edu/search/publicCourseSearchDetails.do?method=load&courseId=5423588&selectedProgramAreaId=18870&selectedProgramStreamId=18876>

Instructor, "Nanotechnology Health and Safety: Exposures to Nanomaterials in Products", URL:

<http://learning.umn.edu/search/publicCourseSearchDetails.do?method=load&courseId=5546096&selectedProgramAreaId=18870&selectedProgramStreamId=18876>

Instructor, "Nanotechnology Health and Safety: Nanomaterials in the Environment", URL:

<https://learning.umn.edu/search/publicCourseSearchDetails.do?method=load&courseId=8820210&selectedProgramAreaId=18870&selectedProgramStreamId=18876>

Instructor, "Nanotechnology Health and Safety: Assessing Dermal Exposures to Nanomaterials", URL:

<https://learning.umn.edu/search/publicCourseSearchDetails.do?method=load&courseId=10347932&selectedProgramAreaId=18870&selectedProgramStreamId=18876>

Instructor, "Nanotechnology Health and Safety: Work Practice & Administrative Controls and PPE for Nanomaterials", URL:

<https://learning.umn.edu/search/publicCourseSearchDetails.do?method=load&courseId=10477941&selectedProgramAreaId=18870&selectedProgramStreamId=18876>

Instructor, "Nanotechnology Health and Safety: Air Cleaners for Nanoparticles", URL:

<https://learning.umn.edu/search/publicCourseSearchDetails.do?method=load&courseId=10481920&selectedProgramAreaId=18870&selectedProgramStreamId=18876>

Instructor, "Personal Protective Equipment: Roles and Responsibilities", no longer available

Technical Contributor, "Decontamination", no longer available

Technical Contributor, "Dirty Bomb! After the Blast", no longer available

Technical Contributor, "Personal Protective Equipment", no longer available

Midwest Center for Occupational Health and Safety

Instructor, Hazardous Chemicals Science Review (Part 2), North Suburban Hazardous Materials Response Team Training, Falcon Heights, MN, December 2011

Instructor, Hazardous Chemicals Science Review, North Suburban Hazardous Materials Response Team Training, Vadnais Heights, MN, December 2010

Co-instructor, Leech Lake Reservation Solid Waste Employee Training, Bena, MN, December 2009

Co-instructor, Comprehensive Industrial Hygiene Review, August 2002

University of Minnesota Center for Public Health Preparedness

Presenter, "Protective Gear", School of Public Health Day, Minnesota State Fair, August 2008

Presenter, "Protective Gear", School of Public Health Day, Minnesota State Fair, August 2007

Instructor, Chemical and Radiological Hazard Awareness for Public Health Workers,

Milwaukee-Waukesha County Consortium for Emergency Public Health Preparedness,
Cudahy, WI, August 2007

Instructor, Hazard Awareness Training for Solid Waste Workers, Leech Lake Reservation, Cass
Lake, MN, August 2006

University of Minnesota: Simulations, Exercises and Effective Education Preparedness and
Emergency Response Learning Center

Instructor, "Protecting the Public Health Worker: Personal Protective Equipment Including
Respiratory Protection", Willmar, MN, July 2012

Instructor, "Protecting the Public Health Worker: Personal Protective Equipment Including
Respiratory Protection", Glencoe, MN, September 2011

Instructor, "Protecting the Public Health Worker: Personal Protective Equipment Including
Respiratory Protection", Alexandria, MN, September 2011

University of Minnesota College of Continuing Education

Instructor, Bioaerosol Measurement Short Course, Minneapolis, MN, August 2010

University of North Carolina at Chapel Hill

Co-instructor, ENVR 245 (Air Pollution Control), Spring 1995

American Industrial Hygiene Association

Co-instructor, "Nanotechnology: Old Theories and New Concepts", Professional Development
Course, *2022 American Industrial Hygiene Conference and Exposition*, Nashville, TN, May
2022

Co-instructor, "Nanotechnology: Old Theories and New Concepts", Professional Development
Course, *2021 American Industrial Hygiene Conference and Exposition*, online, May 2021

Co-instructor, "Nanotechnology: Old Theories and New Concepts", Professional Development
Course, *2019 American Industrial Hygiene Conference and Exposition*, Minneapolis, MN,
May 2019

Instructor, "Nanotechnology Health & Safety: Recognition and Evaluation of Exposures to
Nanomaterials", *American Industrial Hygiene Association-Tidewater Local Section Spring
Professional Development Symposium*, Hampton, VA, May 2018

Co-instructor, "Respirables, Ultrafine, Nano: Size Does Matter", Workshop 6, *2011 Annual
Professional Conference on Industrial Hygiene (PCIH)*, Baltimore, MD, November 2011

Instructor, "Nanotechnology: Toxicology, Including New Information", *2010 American
Industrial Hygiene Association-Upper Midwest Local Section Professional Development
Conference*, St. Paul, MN, November 2010

Instructor, "Nanotechnology: Control Strategies", *2010 American Industrial Hygiene
Association-Upper Midwest Local Section Professional Development Conference*, St. Paul,
MN, November 2010

Lead Instructor, "The FUN of Aerosols: Fine, Ultrafine, and Nano Particles in Workplace Atmospheres", Professional Development Course #429, *2010 American Industrial Hygiene Conference and Exposition*, Denver, CO, May 2010

Co-instructor, "The FUN of Aerosols: Fine, Ultrafine, and Nano Particles in Workplace Atmospheres", Professional Development Course #425, *2007 American Industrial Hygiene Conference and Exposition*, Philadelphia, PA, June 2007

Co-instructor, "The FUN of Aerosols: Fine, Ultrafine, and Nano Particles in Workplace Atmospheres", Professional Development Course #425, *2006 American Industrial Hygiene Conference and Exposition*, Chicago, IL, May 2006

Lead Instructor, "The FUN of Aerosols: Fine, Ultrafine, and Nano Particles in Workplace Atmospheres", Professional Development Course #427, *2005 American Industrial Hygiene Conference and Exposition*, Anaheim, CA, May 2005

Presenter, Emerging Issues Forum 1: Nanotechnologies, April 2005

United States Military

Instructor, Nanotechnology Health & Safety: Anticipation, Recognition, Evaluation & Control, Navy and Marine Corps Public Health Conference, Hampton, VA, March 2019

Advising:

Degrees Compete

<i>Student Name</i>	<i>Degree(Major)</i>	<i>Advisory Role</i>	<i>Completion Year</i>
C. Susie Johnson	M.S. (Env. Hlth.)	Final Exam Member	1999
G. Scott Earnest	Ph.D. (Mech. Eng.)	Prelim & Final Exams Member	2000
Stephanie Waisanen	M.S. (Env. Hlth.)	Final Exam Member	2001
Mira Grice	M.S. (Env. Hlth.)	Final Exam Chair	2002
Choongkee Seong	M.S. (Mech. Eng.)	Final Exam Member	2002
Gina Letts	M.S. (Env. Hlth.)	Advisor; Final Exam Chair	2002
Gong Yun	M.S. (Env. Hlth.)	Final Exam Member	2004
Sreeram Kailasanathan	M.S. (Env. Hlth.)	Final Exam Member	2004
Byung Gyu Kim	M.P.H. (Env. Hlth.)	Final Exam Member	2004
Sumati Dhawan	M.S. (Env. Hlth.)	Advisor	2004
Jeanne Bidwell	M.S. (Env. Hlth.)	Final Exam Member	2004
Tara Oberg	M.S. (Env. Hlth.)	Final Exam Member	2005
Maurice Mazzarella	M.P.H. (Env. Hlth.)	Final Exam Member	2005
Luke Franklin	M.S. (Mech. Eng.)	Final Exam Member	2005
James Farnsworth	M.S. (Mech. Eng.)	Final Exam Member	2005
Stefan Saravia	M.P.H. (Env. Hlth.)	Advisor; Final Exam Chair	2005
Catherine Hovde	M.S. (Env. Hlth.)	Advisor; Final Exam Chair	2005
Phil Jensen	M.P.H. (Env. Hlth.)	Final Exam Member	2005
Brent Weisbrod	M.P.H. (Env. Hlth.)	Final Exam Member	2006
Jo Anne Brock	M.S. (Env. Hlth.)	Advisor; Final Exam Chair	2006
Perianan Periakaruppan	M.S. (Env. Hlth.)	Advisor; Final Exam Chair	2006
Beth Regan	M.P.H. (Env. Hlth.)	Final Exam Chair	2006
Tricia Carmody	M.S. (Env. Hlth.)	Final Exam Chair	2006
Li-ming Lo	Ph.D. (Mech. Eng.)	Prelim & Final Exam Member	2006

Jennifer Austin	M.S. (Env. Hlth.)	Advisor, Final Exam Chair	2006
Katherine Nelson	M.P.H. (Env. Hlth.)	Advisor, Final Exam Chair	2006
Nicholas Stanley	M.S. (Mech. Eng.)	Final Exam Member	2007
Deanna Brown	M.P.H. (Env. Hlth.)	Final Exam Member	2007
Dabrina Dutcher	M.P.H. (Env. Hlth.)	Final Exam Member	2007
Joshua Rocklage	M.S. (Mech. Eng.)	Final Exam Member	2007
Patrick Kinney	M.P.H. (Env. Hlth.)	Final Exam Chair	2008
Sook Ja Cho	Ph.D. (Env. Hlth.)	Prelim Member, Final Exam Chair	2008
Megan Torgrude	M.P.H. (Env. Hlth.)	Final Exam Member	2008
Tracy Glenz	M.S. (Env. Hlth.)	Final Exam Member	2008
Jooyeon Hwang	M.S. (Env. Hlth.)	Advisor, Final Exam Chair	2008
Weihau Tang	Ph.D. (Mech. Eng.)	Prelim & Final Exam Member	2008
Seung Won Kim	Ph.D. (Env. Hlth.)	Dissertation Advisor	2008
Jocelyn Walton	M.P.H. (Env. Hlth.)	Advisor, Final Exam Member	2009
Ji Young Park	Ph.D. (Env. Hlth.)	Prelim & Final Exam Member	2009
Tran Huynh	M.P.H. (Env. Hlth.)	Advisor, Final Exam Chair	2009
Dennis Fox	M.P.H. (Env. Hlth.)	Final Exam Member	2009
Jessica Ingraham	M.P.H. (Env. Hlth.)	Advisor, Final Exam Chair	2009
Sara Fridrych	M.P.H. (Vet P.H.)	Final Exam Member	2010
Stacy Culbert	M.S. (Env. Hlth.)	Final Exam Chair	2010
Karen Lopez	M.P.H. (Vet P.H.)	Final Exam Member	2010
Nikhil Ramesh	M.S. (Mech. Eng.)	Final Exam Member	2010
Nicholas Stanley	Ph.D. (Mech. Eng.)	Prelim & Final Exam Member	2010
Tim Chang	Ph.D. (Env. Hlth.)	Final Exam Chair	2010
Jeff Lanners	M.S. (Env. Hlth.)	Final Exam Member	2010
Michael Wotta	M.S. (Mech. Eng.)	Final Exam Member	2010
Jessica Appert	M.S. (Env. Hlth.)	Advisor, Final Exam Chair	2010
Monika Vadali	Ph.D. (Env. Hlth.)	Prelim Member, Final Exam Chair	2010
Dawn Errede	Ph.D. (Env. Hlth.)	Final Exam Member	2011
Kelly Smeltzer	M.P.H. (Env. Hlth.)	Final Exam Member	2011
Melissa Balint	M.P.H. (Env. Hlth.)	Final Exam Chair	2011
Jessica Tredinnick	M.P.H. (Env. Hlth.)	Final Exam Member	2011
Lorraine Keating-Klika	M.S. (Env. Hlth.)	Final Exam Chair	2011
Joe Hexum	M.S. (Env. Hlth.)	Advisor, Final Exam Chair	2011
Zhun Liu	M.S. (Mech. Eng.)	Final Exam Member	2011
Drew Thompson	M.S. (Mech. Eng.)	Final Exam Member	2012
David Liverseed	M.P.H. (Env. Hlth.)	Final Exam Chair	2012
Meng Zhang	Ph.D. (Mech. Eng.)	Final Exam Member	2012
Amanda Beaudoin	Ph.D. (Vet. Pop. Med.)	Final Exam Member	2012
Ighodalo Collins Omondiagbe	M.P.H. (Env. Hlth.)	Final Exam Member	2012
Andre Reed	M.P.H. (Env. Hlth.)	Advisor, Final Exam Chair	2012
Nancy Bergman	M.S. (Env. Hlth.)	Advisor, Final Exam Chair	2012
Kate Waddick	M.S. (Env. Hlth.)	Final Exam Member	2012
Ben Hunt	M.S. (Mech. Eng.)	Final Exam Member	2013
Michelle Knabb	M.S. (Env. Hlth.)	Final Exam Member	2013
Kelly Mullane	M.S. (Env. Hlth.)	Advisor, Final Exam Member	2013

Jooyeon Hwang	Ph.D. (Env. Hlth.)	Prelim & Final Exam Member	2013
Hanna Henscheid	M.P.H. (Env. Hlth.)	Advisor	2013
Daniel Musser	M.P.H. (Env. Hlth.)	Advisor, Final Exam Member	2013
Dillon Whitacre	M.P.H. (Env. Hlth.)	Advisor; Final Exam Member	2013
Dorian Kvale	M.S. (Env. Hlth.)	Final Exam Member	2013
Song Ge	Ph.D. (Mech. Eng)	Prelim & Final Exam Member	2014
Kurt Prieve	M.S. (Env. Hlth.)	Advisor, Final Exam Chair	2014
Shannon Engelman	M.P.H. (Env. Hlth.)	Final Exam Chair	2014
Zhili Zuo	Ph.D. (Mech. Eng)	Prelim & Final Exam Member	2014
Elizabeth Solom	M.S. (Env. Hlth.)	Advisor, Final Exam Chair	2014
Katherine Kroll	M.P.H. (Env. Hlth.)	Advisor, Final Exam Chair	2014
Lisa Lundberg	M.P.H. (Env. Hlth.)	Advisor, Final Exam Chair	2014
Seungkoo Kang	M.S. (Mech. Eng.)	Final Exam Member	2014
David Paulu	M.S. (BioSciMedPhy)	Final Exam Member	2015
Nicole Gryska	M.S. (Env. Hlth.)	Advisor; Final Exam Chair	2015
Yuan Shao	M.S. (Env. Hlth.)	Advisor; Final Exam Member	2015
Mei Wang	Ph.D. (Env. Hlth.)	Dissertation Advisor	2015
Steve Tousignant	Ph.D. (Vet. Med.)	Prelim & Final Exam Member	2015
Austin Bell	M.S. (Env. Hlth.)	Final Exam Member	2015
Carmen Alonso	Ph.D. (Vet. Med.)	Final Exam Member	2016
Jackson Dalton	M.P.H. (Env. Hlth)	Advisor; Final Exam Chair	2016
Yuan Gao	M.S. (Env. Hlth.)	Final Exam Member	2016
Ali Zhang	M.P.H. (Env. Hlth)	Advisor; Final Exam Chair	2016
Mark Friske	M.P.H. (Env. Hlth)	Advisor; Final Exam Chair	2017
James Meinert	M.P.H. (Env. Hlth.)	Final Exam Member	2017
Colton Porter	M.S. (Env. Hlth.)	Advisor; Final Exam Chair	2017
Eli Miller	M.P.H. (Env. Hlth)	Advisor; Final Exam Chair	2017
Drew Thompson	Ph.D. (Mech. Eng.)	Prelim & Final Exam Member	2017
Chinomso Ibe	M.P.H. (Env. Hlth)	Advisor; Final Exam Member	2017
Greg Hansen	M.P.H. (Env. Hlth)	Final Exam Member	2017
Brandon Jensen	M.S. (Env. Hlth.)	Advisor; Final Exam Chair	2018
Kelli Harstad	M.P.H. (Env. Hlth.)	Advisor; Final Exam Chair	2018
Rony Arauz	Ph.D. (Env. Hlth.)	Prelim & Final Exam Member	2018
Hannah Kaup	M.S. (Env. Hlth.)	Advisor; Final Exam Member	2018
Amber Illies	M.S. (Env. Hlth.)	Final Exam Chair	2018
Keerthanaa Jeeva	M.P.H. (Env. Hlth.)	Final Exam Chair	2019
Andres Gonzalez	Ph.D. (Mech. Eng.)	Prelim & Final Exam Member	2019
Mason Murdock	M.S. (Env. Hlth.)	Final Exam Chair	2020
Otis Heymann	M.P.H. (Env. Hlth.)	Advisor; Final Exam Chair	2020
Amanda Kramer	M.S. (Env. Hlth)	Final Exam Member	2020
Jennifer Sahmel	Ph.D. (Env. Hlth.)	Prelim & Final Exam Member	2021
Dadee Saye	M.S. (Env. Hlth.)	Advisor; Final Exam Member	2021
Puleng Moshele	M.S. (Env. Hlth.)	Advisor; Final Exam Chair	2021
Ryan Rooney	M.S. (Env. Hlth.)	Advisor; Final Exam Chair	2022
Anthony Parker	M.P.H. (Env. Hlth.)	Advisor; Final Exam Chair	2022
Andrea Oleson	M.S. (Env. Hlth.)	Final Exam Member	2023

Degrees Incomplete

<i>Student Name</i>	<i>Degree(Major)</i>	<i>Advisory Role</i>
Adepeju Adesina	Ph.D. (Env. Hlth.)	Advisor
El'gin Avila	Ph.D. (Env. Hlth.)	Advisor
Charles Kreager	M.S. (Env. Hlth.)	Plan B Advisor
Marshall Engstrom	M.S. (Env. Hlth.)	Academic & Plan B Advisor
Mitchell Kruse	M.S. (Env. Hlth.)	Academic Advisor
Natalie Brown	M.S. (Env. Hlth.)	Academic Advisor
Steven Norris	M.S. (Env. Hlth.)	Academic Advisor
Chayo Smith	M.S. (Env. Hlth.)	Academic Advisor
Elliot Holmlund	M.S. (Env. Hlth.)	Academic & Plan B Advisor
Caylin Crawford	M.S. (Env. Hlth.)	Academic & Plan B Advisor
Jamie Ranallo	M.S. (Env. Hlth.)	Academic Advisor
Haley Sadoris	M.S. (Env. Hlth.)	Academic Advisor
Lan Wang	Ph.D. (Vet. Med.)	Committee Member
Mohammed Alnami	M.S. (Env. Hlth.)	Academic Advisor
Ashley Hernandez	Ph.D. (Env. Hlth.)	Committee Member
Julia Toothman	M.S. (Env. Hlth.)	Plan B Advisor
Daniel Luoma	M.S. (Env. Hlth.)	Academic Advisor

Funded Projects:

Co-Investigator & Project Director (PI: Jeff Bender), "Upper Midwest Agricultural Safety and Health Center", NIOSH U54OH0101701, 9/30/22 – 9/29/27

Principal Investigator, "Factors Influencing Transmission of Airborne Viruses", University of Minnesota Foundation: Aerosol Transport Microbiological Organisms and Viruses to Humans Fund, 2021-present

Co-Investigator (PI: Susan Arnold), "The Interdisciplinary Training, Education and Research Activities for Assessing and Controlling Contaminants from Emerging Technologies (InTERACCT) Program", NIEHS 1R25ES033035, 9/1/21 – 8/31/26, \$246,090 in Year 1

Subaward Principal Investigator (PI: Jared Ashcroft, Pasadena City College), "Micro-Nano Technologies Education Center ", National Science Foundation, 7/1/20 – 6/30/25

Principal Investigator, "Midwest Consortium for Hazardous Waste Worker Training (U45), Cooperative Agreement", National Institute of Environmental Health Sciences, 8/1/20 – 5/31/25, \$9,844,678

Co-Investigator & IH Program Director (PI: Marizen Ramirez), "Midwest Center for Occupational Health and Safety", NIOSH, 7/1/20 – 6/30/25

Co-Investigator (PI: William Toscano), "Hazardous Material Worker Health and Safety Training (U45), Cooperative Agreement", Subcontract from University of Cincinnati (NIEHS Prime), 3/1/17 – 7/31/20

Co-Investigator & Project Director (PI: Jeff Bender), "Upper Midwest Agricultural Safety and Health Center", NIOSH U54OH0101701, 9/30/16 – 9/29/22

Principal Investigator, "Midwest Emerging Technologies Public Health and Safety Training Program", NIEHS 1R25ES023595-04, 8/1/16 – 7/31/23, \$750,000

Co-Investigator & IH Program Director (PI: Susan Gerberich), "Midwest Center for Occupational Health and Safety", NIOSH, 7/1/15 – 6/30/20

Co-Investigator (PI: Montse Torremorell). "Highly Pathogenic Avian Influenza (HPAI)", USDA APHIS, 4/20/15 – 12/31/15, \$99,118

Principal Investigator, "Midwest Emerging Technologies Public Health and Safety Training Program", NIEHS 1R25ES023595-01, 8/1/13 – 7/31/16, \$450,000

Co-Investigator (PI: Montse Torremorell). "Evaluation of the Electrostatic Particle Ionization Technology", National Pork Board, 5/1/13-4/30/14.

Co-Investigator (PI: Bruce Alexander), "Upper Midwest Agricultural Safety and Health Center", NIOSH U54OH0101701, 9/30/11 – 9/29/16

Principal Investigator, "Effects of Spray Surfactant and Particle Charge on Respirable Dust Control", NIOSH 1 R01 OH009768-01, 9/15/09 – 9/14/13, \$468,607

Co-Investigator (PI: Debra Olson), "University of Minnesota Simulations, Exercises and Effective Education Preparedness and Emergency Response Learning Center", Centers for Diseases Control and Prevention 1U90TP000418-01, 9/30/10 – 9/29/15

Co-Investigator (PI: Michael Osterholm), "Minnesota Center of Excellence for Influenza Research and Surveillance (MCEIRS)" NIH N01-AI-70007, 9/30/08 – 12/31/11, \$300,000 for program support project.

Co-Investigator (PI: Debora Boyle), "Chemical and Biological Early Detection BioWatch", The Tauri Group, LLC (DHS prime), 9/29/08 - 3/1/11, \$3,872,166

Principal Investigator, "Assessing Potential Nanoparticle Release During Nanocomposite Recycling", US Council for Automotive Research, 9/1/08 – 12/21/09, \$83,773

Co-Investigator (PI: Sagar Goyal), "Measurement of Particle Sizes Associated with Airborne Viruses", NIOSH, 9/1/08 – 8/31/13, \$1,000,000

Principal Investigator, "Pollution Prevention and Energy Efficiency for Minnesota's Metal Fabrication and Machining", EPA, 8/1/08 – 3/31/10, \$26,300

Co-Investigator (PI: Jeff Mandel), "Health Assessment of Taconite Workers", State of Minnesota, 7/1/08 – 6/30/13, \$2,062,043

Co-Investigator (PI: Susan Gerberich), "Midwest Center for Occupational Health and Safety", NIOSH, 7/1/07 – 6/30/15, \$1,487,003

Co-Investigator (PI: Gurusurthy Ramachandran), "Pilot Study for Exposure Characterization Instrumentation", 3M Company, 12/22/06 – 3/31/07, \$25,902

Co-Investigator (PI: Jeff Bender), "Upper Midwest and Thailand Zoonotic Disease Cooperative Research Center", CDC, 8/31/06 – 8/30/09, \$2,621,209

Principal Investigator, "Sampling for Methamphetamine Contamination in Air and HVAC Systems in Former Meth Labs", Minnesota Pollution Control Agency CFMS No. A79651, 9/26/05 – 9/30/06, \$20,420

Principal Investigator, "Evaluating Factors Affecting the Performance of Airborne Infectious Isolation Rooms", Minnesota Medical Foundation, 1/1/06 – 12/31/06, \$23,850

Principal Investigator, "HVAC Filtration for Airborne Microorganisms", 3M Non-tenured Faculty Grant, 1/1/06 – 12/31/08, \$45,000

Co-Investigator (PI: Debra Olson), "University of Minnesota Center for Public Health Preparedness", Centers for Diseases Control and Prevention, 9/1/04 – 8/31/09

Co-Investigator (PI: John Adgate), "Personal Dosimeters for Organophosphates", Platypus Technologies. LLC (National Institute of Environmental Health Sciences prime), 7/20/04 – 5/31/07, \$434,702

- Principal Investigator, "The Influence of Electrical Charge on Filtration of an Airborne Biological Agent", University of Minnesota Academic Health Center Seed Grant # 2004-23, 7/1/04 – 6/30/05, \$24,996
- Co-Investigator (PI: Thomas Kuehn), "Integrated Biological Data from Filter Samples in Buildings", Department of Homeland Security/Technical Support Working Group Contract # W91CRB-04-C-0035, 4/1/04 – 10/31/05, \$520,992
- Principal Investigator, "Supercomputer Modeling of Airborne Particle Filtration", University of Minnesota Academic Health Center Faculty Seed Grant # 2002-39, 7/1/02 – 1/15/04, \$24,977
- Principal Investigator, "Long-Term Filter Performance in a Ventilation System", Johns Manville Corporation, 4/1/01 – 12/31/01, \$22,019
- Principal Investigator, "Measuring Air Pollutants Near an Urban Ethanol Production Facility", Minnesota Medical Foundation, 3/1/01 – 2/28/02, \$24,994
- Principal Investigator, "Use of Vegetable Oils in Metalworking Fluid Formulations", USDA National Research Initiative Grant # 2000-1889, 12/1/00 – 11/30/03, \$120,000
- Principal Investigator, "Model Development for the Design of Better Mist Filters", NIOSH Small Grant Award # 1 R03 OH04164-01, 8/1/00 – 10/31/02, \$68,526
- Principal Investigator, "Evaporative Losses from Semi-Volatile Mist Samples", NIOSH Special Emphasis Research Career Award # 1 K01 OH00185-01, 5/1/00 – 4/30/04, \$161,510
- Principal Investigator, "A Virtual Impactor for Improved Mist Sampling Accuracy", University of Minnesota Grant-in-Aid of Research, Artistry and Scholarship, 1/1/00 – 1/12/01, \$17,481
- Co-Investigator (PI: Thomas Kuehn), "Development of Bioaerosol Filtration Standard Test Methods", University of Minnesota Center for Filtration Research, 1999 – 2002
- Principal Investigator, "Fiber Materials for Improved Mist Filter Performance", University of Minnesota Grant-in-Aid of Research, Artistry and Scholarship, 12/16/98 – 12/15/99, \$14,204

Refereed Publications:

- Adepeju Adesina, Hamada A. Aboubakr, My Yang, Montserrat Torremorell, Sagar M. Goyal, and Peter C. Raynor. "Comparison of Samplers Collecting Airborne Influenza Viruses: 2. Primarily Filters and an Electrostatic Precipitator", submitted to *Journal of Occupational and Environmental Hygiene*.
- Yuan Shao, Jooyeon Hwang, Richard F. MacLehose, Bruce H. Alexander, Jeffrey H. Mandel, Peter C. Raynor, and Gurumurthy Ramachandran. "Reconstructing Historical Exposures to Respirable Dust and Respirable Silica in the Taconite Mining Industry for 1955–2010", *Annals of Work Exposures and Health*, 66(4):459-471 (2022). DOI: 10.1093/annweh/wxab099
- Peter C. Raynor, Adepeju Adesina, Hamada A. Aboubakr, My Yang, Montserrat Torremorell, and Sagar M. Goyal. "Comparison of Samplers Collecting Airborne Influenza Viruses: 1. Primarily Impingers and Cyclones", *PLoS ONE*, 16(1):e0244977 (2021). DOI: 10.1371/journal.pone.0244977
- Mei W. Tessum and Peter C. Raynor. "Measuring Electrostatic Charge on Pneumatically Generated Spray Drops", *Journal of Aerosol Science*, 151:105691 (2021). DOI: 10.1016/j.jaerosci.2020.105691

- Ruth Ruttenberg, Peter C. Raynor, Scott Tobey, and Carol Rice, "Perception of Impact of Frequent Short Training as an Enhancement of Annual Refresher Training", *New Solutions*, 30(2):102-110 (2020). DOI: 10.1177/1048291120920553
- Tran Huynh, Gurumurthy Ramachandran, Harrison Quick, Jooyeon Hwang, Peter C. Raynor, Bruce H Alexander, and Jeffrey H Mandel, "Ambient Fine Aerosol Concentrations in Multiple Metrics in Taconite Mining Operations", *Annals of Work Exposures and Health*, 63(1):77-90 (2019). DOI: 10.1093/annweh/wxy086
- Peter C. Raynor, Shannon Engelman, Darby Murphy, Gurumurthy Ramachandran, Jeffrey B. Bender, and Bruce H. Alexander, "Effects of Gestation Pens Versus Stalls and Wet Versus Dry Feed on Air Contaminants in Swine Production", *Journal of Agromedicine*, 23(1):40-51 (2018). DOI: 10.1080/1059924X.2017.1387633
- Mei W. Tessum and Peter C. Raynor. "Effects of Spray Surfactant and Particle Charge on Respirable Coal Dust Capture", *Safety and Health @ Work*, 8(3):296-305 (2017). DOI: 10.1016/j.shaw.2016.12.006
- Kurt Prieve, Amanda Rice, and Peter C. Raynor. "Compressed Air Noise Reductions from Using Advanced Air Gun Nozzles in Research and Development Environments", *Journal of Occupational and Environmental Hygiene*, 14(8):634-641 (2017). DOI: 10.1080/15459624.2017.1316384
- Carmen Alonso, Peter C. Raynor, Sagar Goyal, Bernard A. Olson, Anna Alba, Peter R. Davies, and Montserrat Torremorell. "Assessment of Air Sampling Methods and Size Distribution of Virus-Laden Aerosols in Outbreaks in Swine and Poultry Farms", *Journal of Veterinary Diagnostic Investigation*, 29(3):298-304 (2017). DOI: 10.1177/1040638717700221
- Jooyeon Hwang, Gurumurthy Ramachandran, Peter C. Raynor, Bruce H. Alexander, and Jeffrey H. Mandel. "A Comprehensive Assessment of Exposures to Respirable Dust and Silica in the Taconite Mining Industry", *Journal of Occupational and Environmental Hygiene*, 14(5):377-388 (2017). DOI: 10.1080/15459624.2016.1263392
- Carmen Alonso, Bernard A. Olson, Sagar Goyal, Peter C. Raynor, Peter R. Davies, and Montserrat Torremorell. "Comparison of Two Size-differentiating Air Samplers for Detecting Airborne Swine Viruses under Experimental Conditions", *Aerosol Science and Technology*, 51(2):198-205 (2017). DOI: 10.1080/02786826.2016.1249278
- Montserrat Torremorell, Carmen Alonso, Peter R. Davies, Peter C. Raynor, Devi Patnayak, Mia Torchetti, and Brian McCluskey. "Investigation into the Airborne Dissemination of H5N2 Highly Pathogenic Avian Influenza Virus During the 2015 Spring Outbreaks in the Midwestern United States", *Avian Diseases*, 60(3):637-643 (2016). DOI: 10.1637/11395-021816-Reg.1
- Carmen Alonso, Peter C. Raynor, Peter R. Davies, Robert B. Morrison, and Montserrat Torremorell. "Evaluation of an Electrostatic Particle Ionization Technology for Decreasing Airborne Pathogens in Pigs", *Aerobiologia*, 32(3):405-419 (2016). DOI: 10.1007/s10453-015-9413-3
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- Nnaemeka U. Odo, Peter C. Raynor, Amanda Beaudoin, Ratana Somrongthong, Joni M. Scheftel, James G. Donahue, and Jeffrey B. Bender. "Personal Protective Equipment Use and Hand Washing among Animal Farmers: A Multi-Site Assessment", *Journal of Occupational and Environmental Hygiene*, 12(6):363-368 (2015). DOI: 10.1080/15459624.2015.1006635

- Song Ge, Thomas H. Kuehn, Martha Abin, Harsha Verma, Aschalew Bekele, Sunil Kumar, Sagar M. Goyal, Jessica Appert, Peter C. Raynor, and Zhili Zuo. "Airborne Virus Survivability During Long-Term Sampling Using a Non-Viable Andersen Cascade Impactor in an Environmental Chamber", *Aerosol Science and Technology*, 48(12):1360-1368 (2014). DOI: 10.1080/02786826.2014.984800
- Mei W. Tessum, Peter C. Raynor, and Lorraine Keating-Klika, "Factors Influencing the Control of Respirable Charged Particles by Surfactant Sprays", *Journal of Occupational and Environmental Hygiene*, 11(9):571-582 (2014). DOI: 10.1080/15459624.2014.887207
- Jooyeon Hwang, Gurumurthy Ramachandran, Peter C. Raynor, Bruce H. Alexander, and Jeffrey H. Mandel, "The Relationship between Various Exposure Metrics for Elongate Mineral Particles (EMP) in the Taconite Mining and Processing Industry", *Journal of Occupational and Environmental Hygiene*, 11(9):613-624 (2014). DOI: 10.1080/15459624.2014.890287
- Zhili Zuo, Thomas Kuehn, Aschalew Bekele, Sunil Kamar, Harsha Verma, Sagar Goyal, Peter Raynor, and David Pui' "Survival of Airborne MS2 Bacteriophage Generated from Human Saliva, Artificial Saliva, and Cell Culture Medium", *Applied and Environmental Microbiology*, 80(9):2796-2803 (2014). DOI: 10.1128/AEM.00056-14
- Jooyeon Hwang, Gurumurthy Ramachandran, Peter C. Raynor, Bruce H. Alexander, and Jeffrey H. Mandel, "Comprehensive Assessment of Exposures to Elongate Mineral Particles in the Taconite Mining Industry", *Annals of Occupational Hygiene* 57(8):966-978 (2013). DOI: 10.1093/annhyg/met026
- Zhili Zuo, Thomas H. Kuehn, Harsha Verma, Sunil Kumar, Sagar M. Goyal, Jessica Appert, Peter C. Raynor, Song Ge, and David Y. H. Pui, "Association of Airborne Virus Infectivity and Survivability with its Carrier Particle Size", *Aerosol Science and Technology*, 47(4):373-382 (2013). DOI: 10.1080/02786826.2012.754841
- David Liverseed, Perry Logan, Carl Johnson, Sandy Morey, and Peter C. Raynor, "Comparative Emissions of Random Orbital Sanding between Conventional and Self-Generated Vacuum Systems", *Annals of Occupational Hygiene*, 57(2):221-229 (2013). DOI: 10.1093/annhyg/mes066
- Jessica Appert, Peter C. Raynor, Martha Abin, Yogesh Chander, Helena Guarino, Sagar M. Goyal, Zhili Zuo, Song Ge, and Thomas H. Kuehn, "Influence of Suspending Liquid, Impactor Type, and Substrate on Size Selective Sampling of MS2 and Adenovirus Aerosols", *Aerosol Science and Technology*, 46(3):249-257 (2012). DOI: 10.1080/02786826.2011.619224
- Peter C. Raynor, Jessica Ingraham Cebula, Jeffrey S. Spangenberg, Bernard A. Olson, Jean M. Dasch, and James B. D'Arcy, "Assessing Potential Nanoparticle Release During Nanocomposite Shredding Using Direct-Reading Instruments", *Journal of Occupational and Environmental Hygiene*, 9(1):1-13 (2012). DOI: 10.1080/15459624.2012.633061
- Ji Young Park, Gurumurthy Ramachandran, Peter C Raynor, and Seung Won Kim. "Estimation of Surface Area Concentration of Workplace Incidental Nanoparticles Based on Number and Mass Concentrations", *Journal of Nanoparticle Research*, 13(10):4897-4911 (2011). DOI 10.1007/s11051-011-0469-x
- Sagar M. Goyal, Senthilvelan Anantharaman, M. A. Ramakrishnan, Suchitra Sajja, Seung Won Kim, Nicholas J. Stanley, James E. Farnsworth, Thomas H. Kuehn, and Peter C. Raynor. "Detection of Viruses in Used Ventilation Filters from Two Large Public Buildings", *American Journal of Infection Control*, 39(7):e30-e38 (2011). DOI: 10.1016/j.ajic.2010.10.036

- Ji Young Park, Gurumurthy Ramachandran, Peter C. Raynor, Lynn E. Eberly, and Greg Olson Jr. "Comparing Exposure Zones by Different Exposure Metrics Using Statistical Parameters: Contrast and Precision", *Annals of Occupational Hygiene*, 54(7):799-812 (2010). DOI: 10.1093/annhyg/meq043
- Peter C. Raynor, Andrea Barteková, J. Girard Griggs, Matt F. Simcik, and John L. Adgate. "Airborne Diazinon Concentrations During and After Outdoor Spray Application", *Journal of Occupational and Environmental Hygiene*, 7(9):506-515 (2010). DOI: 10.1080/15459624.2010.486699
- Ji Young Park, Gurumurthy Ramachandran, Peter C. Raynor, and Gregory M. Olson, Jr. "Determination of Particle Concentration Rankings by Spatial Mapping of Particle Surface Area, Number, and Mass Concentrations in a Restaurant and a Die Casting Plant", *Journal of Occupational and Environmental Hygiene*, 7(8):466-476 (2010). DOI: 10.1080/15459624.2010.485263
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- Beth D. Regan and Peter C. Raynor. "Single-Fiber Diffusion Efficiency for Elliptical Fibers", *Aerosol Science and Technology*, 43(6):533-543 (2009). DOI: 10.1080/02786820902777215
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- Ji Young Park, Peter C. Raynor, Andrew D. Maynard, Lynn E. Eberly, and Gurumurthy Ramachandran. "Comparison of Two Estimation Methods for Surface Area Concentration Using Number Concentration and Mass Concentration of Combustion-Related Ultrafine Particles", *Atmospheric Environment*, 43(3): 502-509 (2009). DOI: 10.1016/j.atmosenv.2008.10.020
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- Stefan A. Saravia, Peter C. Raynor, and Andrew J. Streifel, "A Performance Assessment of Airborne Infection Isolation Rooms", *American Journal of Infection Control*, 35(5):324-331 (2007). DOI: 10.1016/j.ajic.2006.10.012
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- Peter C. Raynor and Thomas M. Peters, "Controlling Nanoparticle Exposures", in *Assessing Nanoparticle Risks to Human Health, 2nd edition* (G. Ramachandran, ed.), Oxford: Elsevier Inc., pp. 153-177 (2016)
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- Peter C. Raynor, Seung Won Kim, and Mrinal Bhattacharya, "Mist Production by Vegetable Oil-Based Metalworking Fluid Emulsions", The Industrial Metalworking Environment: The 3rd Symposium on the Assessment and Control of Metal Removal Fluids, Dearborn, MI, Paper AB518, October 2008
- Charles E. Feigley, Robin R. M. Gershon, Michael Gochfield, Clifford S. Mitchell, Peter C. Raynor, and Diane Zerbe, *Occupational Safety and Worker Preparedness Education: A Compilation from the Centers for Public Health Preparedness*, Report to the Centers for Disease Control and Preparedness from the Association of Schools of Public Health, September 2005
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- Steven Cooper, David Leith, and Peter C. Raynor, "Evaporation of Mineral Oil in a Mist Collector", Symposium Proceedings: The Industrial Metalworking Environment Assessment & Control, Dearborn, MI, November 1995, pp. 355-361
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- Peter C. Raynor and David Leith, "Fates of Droplets Entering a Mist Filtration System", Symposium Proceedings: The Industrial Metalworking Environment Assessment & Control, Dearborn, MI, November 1995, pp. 372-377

Presentations:

- Peter C. Raynor. "Nanotechnology & Additive Manufacturing: Current State of Health & Safety Knowledge", National Safety Council Occupational Safety & Health Network Meeting, Golden Valley, MN, May 2023
- Adepeju Adesina, Peter C. Raynor, Hamada Aboubakr, Sagar M. Goyal, MyYang, and Montserrat Torremorell. "Assessing Exposure to Airborne Swine Influenza A Virus (IAV) in a Minnesota Wean-to-finish Facility", 2021 American Industrial Hygiene Conference and Exposition, virtual, May 2021 (poster)

- Peter C. Raynor, "Assessing Airborne Hazards in Animal Agriculture", University of Minnesota College of Veterinary Medicine Research Seminar, St. Paul, MN, February 2020 (invited)
- Hamada A. Aboubakr, Adepeju Adensina, My Yang, Peter C. Raynor, Montse Torremorell, and Sagar M. Goyal. "Comparison of Air Samplers for Efficient Recovery of Airborne Viruses from Bioaerosols", American Society for Microbiology Biothreats Conference, Arlington, VA, January 2020 (poster & ignite session)
- Adepeju Adesina, Peter C. Raynor, Hamada Aboubakr, Sagar M. Goyal, MyYang, and Montserrat Torremorell. "Detection and Measurement of Airborne Viral Particle Concentration", School of Public Health Research Day, Minneapolis, MN, April 2019 (poster).
- Adepeju Adesina, Peter C. Raynor, Hamada Aboubakr, Sagar M. Goyal, MyYang, and Montserrat Torremorell. "A Comparison of Sampling Methods for Detection and Measurement of Airborne Viral Particle Concentrations", 2019 American Industrial Hygiene Conference and Exposition, Minneapolis, MN, May 2019 (poster)
- Peter C. Raynor, Adepeju Adesina, Hamada Aboubakr, My Yang, Montse Torremorell, and Sagar M. Goyal, "Toward Identifying the Most Effective Samplers for Airborne Viruses", Allen D. Lemman Swine Conference, St. Paul, MN, September 2018 (invited)
- Adepeju Adesina, Peter C. Raynor, Hamada Aboubakr, Sagar M. Goyal, My Yang, and Montse Torremorell, " A Comparison of Sampling Methods to Measure Concentrations and Sizes of Airborne Virus-Containing Particles", Allen D. Lemman Swine Conference, St. Paul, MN, September 2018 (poster)
- Adepeju Adesina, Peter C. Raynor, Hamada Aboubakr, Sagar M. Goyal, and Montse Torremorell, "Evaluating Aerosol Samplers for Characteristics Improving Their Limits of Detection for Influenza Virus", *2018 American Industrial Hygiene Conference and Exposition*, Philadelphia, PA, May 2018 (poster)
- Kelli Harstad and Peter C. Raynor, "Pulse Tools and Hand-Arm Vibration While Fastening and Unfastening Bolts", *2018 American Industrial Hygiene Conference and Exposition*, Philadelphia, PA, May 2018 (poster)
- Brandon Jensen and Peter C. Raynor, "Evaluation of Real-Time Low-Cost Sensors in a Controlled Environment", *2018 American Industrial Hygiene Conference and Exposition*, Philadelphia, PA, May 2018 (poster)
- Keerthanaa Jeeva, Neil Carlson, and Peter C. Raynor, "The Influence of Solid Flooring with Straw Bedding versus Slatted Flooring with Manure Pits on Air Contaminant Concentrations in Swine Facilities", *2018 American Industrial Hygiene Conference and Exposition*, Philadelphia, PA, May 2018 (poster)
- Peter C. Raynor, Thomas M. Peters, Deb M. Newberry, Coleen Dorman, and Adepeju Adesina, "Midwest Emerging Technologies Public Health & Safety Training (METPHAST) Program Update", *2017 Superfund Research Program Annual Meeting*, Philadelphia, PA, December 2017 (poster)
- Pete Raynor, "University of Minnesota IH Program Update + Measurement of Virus Aerosols in the Workplace", *American Industrial Hygiene Association-Upper Midwest Section Meeting*, Roseville, MN, October 2017 (invited)
- Peter C. Raynor, "Nanotechnology Risks and Risk Management in Healthcare", *EHSSENTIALS 2017, Environmental, Health & Safety Symposium for Healthcare*, Rochester, MN, October 2017 (invited)

- Gary Gustafson, Ken Smith, and Peter C. Raynor, "Use of E-learning Technologies and Resources in WTP: Mobile Apps/Online", *Best Practices in Using Technology in HAZMAT Training*, San Juan, PR, March 2017
- Ali Zhang and Peter C. Raynor, "Analyzing Sound Pressure Level Distribution from Monitoring of Research Animal Cage Washers", *2016 American Industrial Hygiene Conference and Exposition*, Baltimore, MD, May 2016 (poster)
- Peter Raynor, Shannon Engelman, Darby Murphy, Gurumurthy Ramachandran, Jeff Bender, and Bruce Alexander, "Factors Affecting Particle and Gas Concentrations in Swine Production Facilities", Paper 8AG.5, *Thirty-Fourth Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 2015 (poster)
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- Peter C. Raynor, Darby Murphy, Shannon Engelman, Gurumurthy Ramachandran, Jeff B. Bender, and Bruce H. Alexander, "Airborne Measurements of Dust, Endotoxin and Contaminant Gases in Swine Production", *2015 American Industrial Hygiene Conference and Exposition*, Salt Lake City, UT, June 2015
- Nicole M. Gryska, Peter C. Raynor, Perry W. Logan and Zhiyuan Xu, "Effectiveness of Bayesian Decision Analysis to Correctly Identify Noise Exposure Categories with Small Data Sets", *2015 American Industrial Hygiene Conference and Exposition*, Salt Lake City, UT, June 2015 (poster)
- Peter C. Raynor, Gurumurthy Ramachandran, Thomas M. Peters, Deb M. Newberry, Ruth Rasmussen, and Austin Bell, "The Midwest Emerging Technologies Public Health & Safety Training (METPHAST) Program", *2014 Superfund Research Program Annual Meeting*, San Jose, CA, November 2014 (poster)
- Peter C. Raynor, Darby Murphy, Shannon Engleman, Gurumurthy Ramachandran, Jeff B. Bender and Bruce H. Alexander, "Effects of Production Practices and Environmental Factors on Air Contaminants in Swine Facilities", *7th International Symposium: Safety & Health in Agricultural & Rural Populations (SHARP)*, Saskatoon, Saskatchewan, Canada, October 2014
- Mei W. Tessum and Peter C. Raynor, "Effects of Spray Surfactant and Particle Charge on Respirable Coal Dust Capture", *2014 American Industrial Hygiene Conference and Exposition*, San Antonio, TX, June 2014 (poster)
- Betsy R. Solom, Peter C. Raynor, John Snawder and Dawn Errede, "Comparison of Gasoline and Diesel-Powered Vehicles for Employee Exposure to Diesel Particulate Matter", *2014 American Industrial Hygiene Conference and Exposition*, San Antonio, TX, June 2014 (poster)
- Kurt W. Prieve, Peter C. Raynor, and Amanda L. Rice, "Compressed Air Noise Reductions Among Air Guns Within Research and Development Environments", *2014 American Industrial Hygiene Conference and Exposition*, San Antonio, TX, June 2014 (poster)
- Peter C. Raynor, "Taconite Mining Compared to Sulfide Mining", Presentation to the University of Minnesota Environmental and Energy Law Society, Minneapolis, MN, November 2013
- Mei Wang and Peter Raynor, "Factors Influencing the Control of Respirable Charged Particles by Surfactant Spray", *2013 American Industrial Hygiene Conference and Exposition*, Montreal, Canada, May 2013

- Peter C. Raynor, "Nanomaterials: Can we work with and get rid of them safely?", Division of Environmental Health Sciences Seminar, Minneapolis, MN, February 2013
- Peter C. Raynor, "Nanomaterials: Health, Disposal & Recycling Issues", Presentation to Alliance of Hazardous Materials Professionals Northern Star Chapter, Minneapolis, MN, January 2013
- Peter C. Raynor, "Aerobiology and the Principles of Air Filtration: What Do We Need to Know?", *Allen D. Lemay Swine Conference, Carlos Pijoan SDEC Symposium on Managing Filtered Farms*, St. Paul, MN, September 2012 (invited)
- Jessica C. Appert, Peter C. Raynor, Sagar M. Goyal, Martha C. Abin, Yogesh Chander, Thomas H. Kuehn, Zhili Zuo, and Song Ge, "Effect of Relative Humidity on Sampling of Airborne Viruses", *2012 American Industrial Hygiene Conference and Exposition*, Indianapolis, IN, June 2012
- Mei Wang and Peter Raynor, "Effects of Spray Surfactant and Particle Charge on Respirable Dust Control", *2012 American Industrial Hygiene Conference and Exposition*, Indianapolis, IN, June 2012
- Jooyeon Hwang, Gurumurthy Ramachandran, Peter Raynor, Bruce Alexander, and Jeffrey Mandel, "Reconstructing Exposures (1973–2010) to Elongated Mineral Particles (EMPs) on Minnesota's Iron Range Based on Different Size-based Definitions", *2012 American Industrial Hygiene Conference and Exposition*, Indianapolis, IN, June 2012
- Andre M. Reed and Peter C. Raynor, "Evaluating the Performance of a Surface Area Monitor and an Ultrafine Particle Counter using a Differential Mobility Analyzer", *2012 American Industrial Hygiene Conference and Exposition*, Indianapolis, IN, June 2012 (poster)
- Nancy Bergman and Peter C. Raynor, "Noise Reductions Associated with Air Nozzle Changes on a Punch Press", *2012 American Industrial Hygiene Conference and Exposition*, Indianapolis, IN, June 2012 (poster)
- Peter C. Raynor, Jessica Ingraham Cebula, Jeffrey S. Spangenberg, Bernard A. Olson, Jean M. Dasch, and James B. D'Arcy, "Evaluating Nanoparticle Generation during Shredding of Nanocomposites for Recycling", *Safety Issues and Regulatory Challenges of Nanomaterials*, San Sebastian, Spain, May 2012 (invited)
- Peter C. Raynor, Jessica C. Appert, Sagar M. Goyal, Martha C. Abin, Yogesh Chander, Helena Guarino, Thomas H. Kuehn, Zhili Zuo, and Song Ge, "Virus Recovery Using Cascade Impactors", *Aerobiology in Biodefense IV*, Glen Allen, VA, June 2011 (poster)
- Peter C. Raynor, "Interdisciplinary Bioaerosol Research", *Third Annual Infectious Disease Corridor Symposium*, Minneapolis, MN, June 2011 (invited)
- Peter C. Raynor, Jessica C. Appert, Sagar M. Goyal, Martha C. Abin, Yogesh Chander, Helena Guarino, Thomas H. Kuehn, Zhili Zuo, and Song Ge, "Relative Effectiveness of Impactor Sampling Among Six Airborne Viruses", *2011 American Industrial Hygiene Conference and Exposition*, Portland, OR, May 2011
- Melissa M. Balint and Peter C. Raynor, "Comparison of the Within-Location Variability to the Between-Location Variability of Airborne Particle Concentrations in a Taconite Mining Operation", *2011 American Industrial Hygiene Conference and Exposition*, Portland, OR, May 2011 (poster)
- Jooyeon Hwang, Gurumurthy Ramachandran, Peter C. Raynor, Bruce H. Alexander, and Jeffrey H. Mandel, "Method to Convert Fiber Counts Asbestos and Non-asbestos Based on NIOSH 7400/7402 into Counts Based on Other Fiber Definitions", *2011 American Industrial Hygiene Conference and Exposition*, Portland, OR, May 2011 (poster)

- Peter C. Raynor, "Control Strategies for Engineered Nanoparticles", *Engineering Nanoparticle (ENP) IH Overview*, 3M Company, St. Paul, MN, February 2011 (invited)
- Thomas H. Kuehn, Nicholas J. Stanley, Peter C. Raynor, Seung Won Kim, Sagar M. Goyal, Senthilvelan Anantharaman, M. A. Ramakrishnan, "Ventilation Filters as High Volume Sampling Devices for Airborne Bacteria and Virus Particles in Buildings", Paper 8.E, *ASHRAE IAQ Conference*, Kuala Lumpur, Malaysia, November 2010.
- Peter C. Raynor, Jo Anne Brock, and Monika Vadali, "The Influence of Particle Charging on Filtration by Electret and Fiberglass Media", Paper 3D.2, *Twenty-Ninth Annual Conference of the American Association for Aerosol Research*, Portland, OR, October 2010
- Peter C. Raynor, Jessica A. Ingraham, Bernard A. Olson, Jeffrey S. Spangenberg, James B. D'Arcy, and Jean M. Dasch, "Particle Generation During Nanocomposite Recycling", *2010 American Industrial Hygiene Conference and Exposition*, Denver, CO, May 2010
- Jooyeon Hwang, Gurumurthy Ramachandran, and Peter C. Raynor, "Updated Analysis of Taconite Fibers in the Iron Range, MN", *2010 American Industrial Hygiene Conference and Exposition*, Denver, CO, May 2010
- Dawn Errede, Peter C. Raynor, and Lisa Peterson, "Investigation of the Influence of Growth Substrate and Age of Culture on Mycotoxin Distribution on Fungal Structures and Fragments", *2010 American Industrial Hygiene Conference and Exposition*, Denver, CO, May 2010
- Elizabeth Tobias and Peter C. Raynor, "Validation of Differential Mobility Analyzer for Concurrent Charge and Size Determination", *2010 American Industrial Hygiene Conference and Exposition*, Denver, CO, May 2010 (poster)
- Peter C. Raynor, Jessica A. Ingraham, Jeffrey S. Spangenberg, James B. D'Arcy, Jean M. Dasch, and Bernard A. Olson, "Evaluating the Potential for Nanoparticle Generation During Nanocomposite Recycling", Paper 10.C.3, *Twenty-Eighth Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 2009
- Seung Won Kim and Peter C. Raynor, "Estimating Vapor and Particle Concentrations Simultaneously Using a Semivolatile Aerosol Dichotomous Sampler", Paper 3.G.20, *Twenty-Eighth Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 2009 (poster)
- Peter C. Raynor, "Control Measures for Nanoparticles", *2009 Annual Professional Conference on Industrial Hygiene (PCIH)*, Vancouver, Canada, October 2009 (invited)
- Peter C. Raynor and Rolando Gonzalez, "Acceptable Pressure Differentials for Isolation Rooms with Door Opening", *2009 American Industrial Hygiene Conference and Exposition*, Toronto, Canada, June 2009
- Seung Won Kim and Peter C. Raynor, "Simultaneous Assessment of Vapor and Particle Concentrations Using a Semivolatile Aerosol Dichotomous Sampler", *2009 American Industrial Hygiene Conference and Exposition*, Toronto, Canada, June 2009
- Ji Young Park, Gurumurthy Ramachandran, and Peter C. Raynor, "Occupational Exposure Assessment for Nanoparticles Using Multiple Metrics", *2009 American Industrial Hygiene Conference and Exposition*, Toronto, Canada, June 2009
- Jessica A. Ingraham and Peter C. Raynor, "Assessing Potential Nanoparticle Release During Nanocomposite Recycling in the Automobile Industry", *2009 American Industrial Hygiene Conference and Exposition*, Toronto, Canada, June 2009 (poster)

- Tran Huynh, Michele Schermann, and Peter C. Raynor, "Duck Husbandry Practices and Farmers' Beliefs About Avian Influenza in South Vietnam", *2009 American Industrial Hygiene Conference and Exposition*, Toronto, Canada, June 2009 (poster)
- Stacy Culbert, Perry Logan, and Peter C. Raynor, "Evaluating the Impact of Adopting a 3 dB Exchange Rate for Noise Measurement", *2009 American Industrial Hygiene Conference and Exposition*, Toronto, Canada, June 2009 (poster)
- Peter C. Raynor, "Nanoparticles: Assessing and Limiting Exposures", *75th Annual Minnesota Safety & Health Conference*, Minneapolis, MN, May 2009 (invited)
- Peter Raynor, "What Do We Know About Viruses in the Air?", seminar at University of Iowa, Department of Occupational and Environmental Health, Iowa City, IA, April 2009 (invited)
- Peter C. Raynor, Seung Won Kim, and Mrinal Bhattacharya, "Mist Production by Vegetable Oil-Based Metalworking Fluid Emulsions", *The Industrial Metalworking Environment: 3rd Symposium on the Assessment and Control of Metal Removal Fluids*, Dearborn, MI, October 2008
- Seung Won Kim and Peter C. Raynor, "A Sampler for Simultaneous Assessment of Metalworking Fluid Droplet and Vapor Concentrations", *The Industrial Metalworking Environment: 3rd Symposium on the Assessment and Control of Metal Removal Fluids*, Dearborn, MI, October 2008 (poster)
- Jooyeon Hwang and Peter C. Raynor, "Evaluating PM10 Concentrations in Rural Areas and in Hanoi and Ho Chi Minh City in Vietnam", *136th Annual American Public Health Association Meeting*, San Diego, CA, October 2008 (poster)
- Ji Young Park, Gurumurthy Ramachandran, and Peter C. Raynor, "Determination of Exposure Rankings by Mass, Number, and Surface Area Metrics Using Mapping Measurement in Workplaces Generating Nanoparticles", *2008 American Industrial Hygiene Conference and Exposition*, Minneapolis, MN, June 2008
- Ji Young Park, Gurumurthy Ramachandran, and Peter C. Raynor, "Estimation of Surface Area Concentration of Workplace Ultrafine Particles Based on Number and Mass Concentrations", *2008 American Industrial Hygiene Conference and Exposition*, Minneapolis, MN, June 2008
- Seung Won Kim and Peter C. Raynor, "Optimization Studies on a Semivolatile Aerosol Dichotomous Sampler", *2008 American Industrial Hygiene Conference and Exposition*, Minneapolis, MN, June 2008
- Michael Buck, Andrew Streifel and Peter Raynor, "Infection Control Commissioning – Special Ventilation Rooms in Healthcare Facilities", *2008 American Industrial Hygiene Conference and Exposition*, Minneapolis, MN, June 2008 (poster)
- Jooyeon Hwang and Peter C. Raynor, "Evaluating Particulate Matter 10 Concentrations in Rural Areas and Hanoi and Ho Chi Minh City in Vietnam", *2008 American Industrial Hygiene Conference and Exposition*, Minneapolis, MN, June 2008 (poster)
- Peter C. Raynor, "Nanoparticles: Uses and Concerns", *74th Annual Minnesota Safety & Health Conference*, Minneapolis, MN, May 2008 (invited)
- Peter C. Raynor, "Nanoparticles: Assessing and Limiting Exposures", *74th Annual Minnesota Safety & Health Conference*, Minneapolis, MN, May 2008 (invited)
- Peter Raynor and Seung Won Kim, "Airborne Microorganisms: Their Evaluation and Control", Midwest Center for Occupational Health and Safety Interdisciplinary Seminar, Minneapolis, MN, March 2008

- Andrea Barteková, Peter Raynor, and John Adgate, "Comparison of a Novel Liquid Crystal Monitor for Organophosphate Pesticides to a Conventional Sampling Method", *2007 American Industrial Hygiene Conference and Exposition*, Philadelphia, PA, June 2007
- Peter C. Raynor, "Approaches for Exposure Assessment and Control for Airborne Infectious Agents", presentation to the Particle Society of Minnesota St. Paul, MN, December 2006 (invited)
- Peter C. Raynor, Jo Anne Brock, and Monika Vadali, "Influences on Collection of Airborne Bacterial Spores by Charged Filter Media", Paper 15E2, *7th International Aerosol Conference*, St. Paul, MN, September 2006
- Ji Young Park, Gurumurthy Ramachandran, Peter C. Raynor, and Lynn E. Eberly, "Comparison of Two Methods for Estimating Surface Area Concentration Using Number and Mass Concentrations", Paper 10C4, *7th International Aerosol Conference*, St. Paul, MN, September 2006
- Senthilvelan Anantharaman, M.A. Ramakrishnan, Sagar M. Goyal, Seung Won Kim, Peter Raynor, Nicholas J. Stanley, and Thomas H. Kuehn, "Airborne Human Viruses Captured by HVAC Filters", Paper 13D3, *7th International Aerosol Conference*, St. Paul, MN, September 2006
- Seung Won Kim and Peter C. Raynor, "Design for a New Vapor Aerosol Dichotomous Sampler", Paper 6H9, *7th International Aerosol Conference*, St. Paul, MN, September 2006 (poster)
- Thomas Kuehn, Nicholas Stanley, Seung Won Kim, M.A. Ramakrishnan, Senthilvelan Anantharaman, Peter Raynor, and Sagar Goyal, "Background Airborne Bacteria and Virus Populations In and Near Buildings Using Ventilation Filters as Long-Term Bioaerosol Collection Devices", Paper 8H25, *7th International Aerosol Conference*, St. Paul, MN, September 2006 (poster)
- M.A. Ramakrishnan, Sagar M. Goyal, Senthilvelan Anantharaman, Seung Won Kim, Peter Raynor, Nicholas J. Stanley, and Thomas H. Kuehn, "Detection of Airborne Bacteria in HVAC Filters by Polymerase Chain Reaction", Paper 11G32, *7th International Aerosol Conference*, St. Paul, MN, September 2006 (poster)
- Peter C. Raynor, "Use of HVAC Systems to Limit the Spread of Airborne Microorganisms", presentation to the Minnesota Indoor Air Association, St. Paul, MN, June 2006 (invited)
- Seung Won Kim, James Farnsworth, Sagar Goyal, Peter C. Raynor, and Thomas Kuehn, "Bacterial Aerosol Measurements Using Ventilation Filters in Building Air Handling Units", *2006 American Industrial Hygiene Conference and Exposition*, Chicago, IL, May 2006
- Tricia Carmody, Peter C. Raynor, and Martin Bevan, "Development of an Air Sampling Protocol for Sampling in Former Methamphetamine Laboratories", *2006 American Industrial Hygiene Conference and Exposition*, Chicago, IL, May 2006 (poster)
- Jo Anne Brock and Peter C. Raynor, "Efficiency of Filter Media with Biological and Non-Biological Agents", *2006 American Industrial Hygiene Conference and Exposition*, Chicago, IL, May 2006 (poster)
- Ji Young Park, Gurumurthy Ramachandran, Peter C. Raynor, Lynn E. Eberly, and Andrew D. Maynard, "Comparison of Two Surface Area Concentration Estimation Methods Using Number and Mass Concentrations", *2006 American Industrial Hygiene Conference and Exposition*, Chicago, IL, May 2006 (poster)

- Seung Won Kim and Peter C. Raynor, "Mist Generation from Vegetable-Oil Based Metalworking Fluids by Three Mechanism", presentation to the Upper Midwest Section-American Industrial Hygiene Association, Roseville, MN, October 2005 (invited)
- Peter C. Raynor, "Worker Competencies for Emergency Preparedness", *The 3rd Annual Statewide Partners' Conference on Public Health and Hospital Emergency Preparedness*, Milwaukee, WI, September 2005 (invited)
- Seung Won Kim and Peter C. Raynor, "Mist Generation from Vegetable-Oil Based Metalworking Fluids by Three Mechanisms", *2005 American Industrial Hygiene Conference and Exposition*, Anaheim, CA, May 2005
- Peter C. Raynor, "Preparedness in the Workplace: Training and Research Activities at the University of Minnesota", presentation to the Upper Midwest Section-American Industrial Hygiene Association, Roseville, MN, February 2005 (invited)
- Peter C. Raynor, "Using HVAC Systems to Limit the Spread of Infectious Agents", seminar at the University of Minnesota, Division of Environmental Health Sciences, Minneapolis, MN, January 2005 (invited)
- Peter C. Raynor and Seung Won Kim, "CFD Modeling of Filter Fibers with Non-Circular Cross Sections", Paper 5B1, *Twenty-Third Annual Conference of the American Association for Aerosol Research*, Atlanta, GA, October 2004
- Peter C. Raynor, "Modeling the Influence of Fiber Shape on Filter Performance", *2004 Symposium – The National Occupational Research Agenda (NORA): Health and Safety Priorities for the 21st Century*, Minneapolis, MN, May 2004 (poster)
- Peter C. Raynor, "Modeling the Influence of Fiber Shape on Filter Performance", *2004 American Industrial Hygiene Conference and Exposition*, Atlanta, GA, May 2004 (poster)
- Peter C. Raynor, "Performance Predictions for Air Filters Made from Fibers with Non-Circular Cross Sections", Paper 311-1, *World Filtration Congress 9*, New Orleans, LA, April 2004
- Peter C. Raynor and Gina Letts, "Influence of Fiber Material on Mist Filter Performance", Paper 2E2, *Twenty-Second Annual Conference of the American Association for Aerosol Research*, Anaheim, CA, October 2003
- Peter C. Raynor, Gina Letts, and Seung Won Kim, "Factors Affecting the Long-Term Performance of Mist Control Filters", *Sixteenth Annual Technical Conference and Exposition of the American Filtration and Separations Society*, Reno, NV, June 2003
- Peter C. Raynor and Mira Grice, "Experimental Evaluation of Evaporative Losses During Metalworking Fluid Mist Sampling", *2003 American Industrial Hygiene Conference and Exposition*, Dallas, TX, May 2003
- Seung Won Kim and Peter Raynor, "Developing a Better Vapor/Aerosol Dichotomous Sampler", *2003 American Industrial Hygiene Conference and Exposition*, Dallas, TX, May 2003 (poster)
- Peter C. Raynor and Soo Jae Chae, "Effects of Particle Loading on Electrically Charged Filters in an HVAC System", *American Filtration & Separations Society Indoor Air Quality-Filtration Conference*, Cincinnati, OH, November 2002
- Peter C. Raynor and Soo Jae Chae, "Influence of Long-Term Particle Loading on Efficiency of Electrically Charged Filters", Paper 2D1, *Twenty-First Annual Conference of the American Association for Aerosol Research*, Charlotte, NC, October 2002
- Peter C. Raynor and Mira Grice, "Assessment of Evaporative Losses During Sampling of Metalworking Fluid Mist", *Health Effects of Mineral Oil Mist & Metalworking Fluids Symposium*, Cincinnati, OH, October 2002 (poster)

- Peter C. Raynor, Soo Jae Chae, Charles Kern, and Andrew Streifel, "Efficiency Changes for Filters Made from Fibers Carrying Electrostatic Charge", *2002 American Industrial Hygiene Conference and Exposition*, San Diego, CA, June 2002
- Choongkee Seong, Thomas H. Kuehn, Gong Yun, Peter C. Raynor, and Donald Vesley, "Procedure for Testing the Efficiency of Filter Media Exposed to an Airborne Microorganism", Paper 5A1, *Twentieth Annual Conference of the American Association for Aerosol Research*, Portland, OR, October 2001
- Peter C. Raynor, "Optimization of Filters Made Using Fibers with Elliptical Cross Sections", Paper 5A4, *Twentieth Annual Conference of the American Association for Aerosol Research*, Portland, OR, October 2001
- Peter C. Raynor, "Determinants of Evaporative Losses from Metalworking Fluid Mist Sampling Filters", *2001 American Industrial Hygiene Conference and Exposition*, New Orleans, LA, June 2001
- Gina M. Letts, Rebecca Schumann, and Peter C. Raynor, "Selecting Fiber Materials to Improve Mist Filters", *2001 American Industrial Hygiene Conference and Exposition*, New Orleans, LA, June 2001 (poster)
- Katherine R. Nelson and Peter C. Raynor, "Calibration and Sampling Performance of a Virtual Impactor for Metalworking Fluid Mists", *2001 American Industrial Hygiene Conference and Exposition*, New Orleans, LA, June 2001 (poster)
- Peter C. Raynor, Gina Letts, and Rebecca Schumann, "Choosing Fiber Materials to Promote Improved Mist Collection", Paper 24-3, *Fourteenth Annual Technical Conference and Exposition of the American Filtration and Separations Society*, Tampa, FL, May 2001
- Peter C. Raynor, "Improving the Long-Term Performance of Mist Control Filters", seminar at University of Cincinnati, Department of Civil and Environmental Engineering, Cincinnati, OH, April 2001 (invited)
- Peter C. Raynor, Rebecca Schumann, and Harpreet Bhatia, "Effect of Fiber Material on Wetted Filter Performance", Paper 4PK4, *Nineteenth Annual Conference of the American Association for Aerosol Research*, St. Louis, MO, November 2000 (poster)
- Peter C. Raynor, "Modeling Evaporative Losses from Mist Sampling Filters", Paper 11PA5, *Nineteenth Annual Conference of the American Association for Aerosol Research*, St. Louis, MO, November 2000 (poster)
- Peter C. Raynor, "What? Me Worry? An Example of Why You Should Worry About How You Measure Exposure", seminar at the University of Minnesota, Division of Environmental and Occupational Health, Minneapolis, MN, February 2000
- Peter C. Raynor, "Design of Filters for Improved Mist Collection", *Air Filtration Conference of the American Filtration and Separations Society*, Minneapolis, MN, October 1999
- Peter C. Raynor, "Single-Fiber Filtration Theory for Fibers with Elliptical Cross Sections", Paper 4E2, *Eighteenth Annual Conference of the American Association for Aerosol Research*, Tacoma, WA, October 1999
- Peter C. Raynor, "Design of Filters for Long-Term Droplet Collection", *1999 American Industrial Hygiene Conference and Exposition*, Toronto, Canada, June 1999
- Peter C. Raynor, "Metalworking Fluids: Hazards, Evaluation, and Control", *Second Annual Professional Development Conference of the Upper Midwest Local Section of the American Industrial Hygiene Association*, St. Paul, MN, November 1998 (invited)

- Peter C. Raynor and David Leith, "Modeling Collection of Mist Droplets by Wetted Filters", Paper 13B3, *Seventeenth Annual Conference of the American Association for Aerosol Research*, Cincinnati, OH, June 1998
- Peter C. Raynor, "Improving the Control of Airborne Droplets", seminar at Clemson University, Department of Environmental Engineering and Science, Anderson, SC, March 1998 (invited)
- Peter C. Raynor, "Improving the Control of Airborne Droplets", seminar at Clarkson University, Department of Civil and Environmental Engineering, Potsdam, NY, March 1998 (invited)
- Peter C. Raynor, John Volckens, and David Leith, "Modeling Evaporative Loss of Oil Mist Collected by Sampling Filters", *ACGIH 1998 Applied Workshop: Occupational and Environmental Exposure Assessment*, Chapel Hill, NC, February 1998
- Peter C. Raynor, "Improving the Control of Metal Removal Fluid Mists", seminar at the University of Minnesota, Division of Environmental and Occupational Health, Minneapolis, MN, February 1998 (invited)
- Peter C. Raynor and David Leith, "Factors Influencing Temporal Efficiency Changes in Mist Filters", Paper 1E1, *Sixteenth Annual Conference of the American Association for Aerosol Research*, Denver, CO, October 1997
- Peter C. Raynor and David Leith, "Processes Affecting Performance of Mist Collection Filters", *American Automobile Manufacturers Association Metalworking Fluids Symposium II*, Detroit, MI, September 1997
- Peter C. Raynor and David Leith, "Evaporation of Accumulated Multicomponent Liquids from Fibrous Filters", Paper 12PLB5, *Fifteenth Annual Conference of the American Association for Aerosol Research*, Orlando, FL, October 1996 (poster)
- Peter C. Raynor, Steven Cooper, and David Leith, "Evaporation of Polydisperse Multicomponent Oil Droplets", *American Automobile Manufacturers Association Metalworking Fluids Symposium*, Dearborn, MI, November 1995 (poster)
- Peter C. Raynor and David Leith, "Fates of Droplets Entering a Mist Filtration System", *American Automobile Manufacturers Association Metalworking Fluids Symposium*, Dearborn, MI, November 1995 (poster)
- Peter C. Raynor, Steven Cooper, and David Leith, "A Model to Predict Changes in the Size Distribution of Multicomponent Droplets Caused by Evaporation", Paper 5A.1, *Fourth International Aerosol Conference*, Los Angeles, CA, August 1994