

WEI-CHUNG SU, Ph.D., CIH

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EXPERTISE

My research interests are centered on aerosol related environmental and industrial health issues. I have more than 14 years of experience in industrial hygiene related laboratory research with a specialization in studying aerosol human respiratory deposition, and aerosol sampler wind tunnel tests especially for workplace fibers and nanomaterials. I am also a Certified Industrial Hygienist (CIH). I have comprehensive knowledge in industrial hygiene related sampling and monitoring strategies, direct-reading instrumentation, field measurement, exposure assessment, and result interpretation. I am currently the chair of Aerosol Technology Committee, and an active member of Nanotechnology Working Group as well as Healthcare Working Group in American Industrial Hygiene Association (AIHA).

EDUCATION

1997-2002	UNIVERSITY OF MICHIGAN	ANN ARBOR, MI
	<i>Ph.D. in Environmental Health Sciences</i>	
1993-1995	NATIONAL TAIWAN UNIVERSITY	TAIWAN
	<i>Master of Science in Atmospheric Science</i>	
1989-1993	NATIONAL CENTRAL UNIVERSITY	TAIWAN
	<i>Bachelor of Science in Atmospheric Science</i>	

EXPERIENCE

2016- ASSISTANT PROFESSOR

Department of Epidemiology, Human Genetics, and Environmental Sciences in the School of Public Health, University of Texas Health Science Center at Houston, Houston, TX

2005-2016 ASSOCIATE RESEARCH SCIENTIST

Aerosol and Respiratory Dosimetry Program, Lovelace Respiratory Research Institute, Albuquerque, NM

- Collaborated with NIOSH scientists on developing a unique experimental approach for carrying out workplace nanomaterial aerosol human respiratory tract deposition experiments
- Conducted workplace nanomaterial aerosol generation, characterization, sampling, electron microscopy, and statistical analysis
- Conducted occupational health related personal bioaerosol sampler performance evaluation tests in both a large scale wind tunnel (mannequin study) and a small scale wind tunnel
- Conducted large stationary radioactive aerosol sampler wind tunnel performance evaluation tests
- Conducted environmental health related aerosol field sampling

- Collaborated with universities on conducting pharmaceutical nasal aerosol drug delivery experiments

2010-present ADJUNCT ASSISTANT PROFESSOR

College of Pharmacy, University of New Mexico, Albuquerque, NM

- Guest instructor: *Nasal Drug Delivery Systems*

2002-2005 POSTDOCTORAL FELLOW

Aerosol and Respiratory Dosimetry Program, Lovelace Respiratory Research Institute, Albuquerque, NM

- Conducted occupational health associated fiber aerosol generation, characterization, sampling, and phase contrast microscopy analysis
- Manufactured human nasal, oral, and lung airways replicas and conducted occupational health related fiber aerosol human respiratory tract replica deposition experiments and associated data analysis
- Conducted stationary aerosol sampler wind tunnel performance evaluation tests

2000-2002 TEACHING ASSISTANT and GRADUATE STUDY

Department of Environmental Health Sciences, University of Michigan, Ann Arbor, MI

- Teaching assistant in the course, *Principles of Environmental Health Science*
- Designed and conducted laboratory calm air aerosol sampling experiments
- Carried out numerical simulation for aerosol sampling in ideal calm air situation
- Developed semi-empirical model for estimating the aspiration efficiency of calm air aerosol sampling

1995-1997 RESEARCH ASSISTANT

Global Change Center, National Taiwan University, Taipei, Taiwan

- Conducted numerical simulation on SO₂ and NO_x emission and associated acid rain precipitation in Taiwan area
- Carried out numerical simulation for UV radiation (UVB) at various locations in Taiwan

1993-1995 GRADUATE STUDY

Department of Atmospheric Science, National Taiwan University, Taipei, Taiwan

- Analyzed Taiwan EPA ozone measurement data for investigating the correlation between the weather factors and the urban ozone concentration
- Numerically simulated the generation and variation of urban ozone concentration using UAM (urban airshed model)

PROFESSIONAL AWARD

- Leadership Award, *American Industrial Hygiene Association*

PROFESSIONAL CERTIFICATES

- Certified Industrial Hygienist *American Board of Industrial Hygiene (10768 CP)*
- OSHA 30-hour Outreach Training - General Industry completed
- OSHA 30-hour Outreach Training - Construction completed

- OSHA 40-hour HAZWOPER Training completed

PROFESSIONAL AFFILIATION

Chair (2016-2017), Aerosol Technology Committee, *American Industrial Hygiene Association*

Active Member, Nanotechnology Working Group, *American Industrial Hygiene Association*

Active Member, Healthcare Working Group, *American Industrial Hygiene Association*

Board Member (2011-2013), *Association of Chinese-American Engineers and Scientists*

Member, *American Association for Aerosol Research*

PROFESSIONAL ACTIVITIES

- Scientific Journal Reviewer

Journal of Aerosol Science, Aerosol Science and Technology, Journal of Toxicology and Environmental Health, Journal of Nanomaterials, Drug Development and Industrial Pharmacy, Journal of Environmental Science and Pollution Research, etc.

- NIOSH Study Section Reviewer

NIOSH SOH 2012, 2014, 2015, 2016, 2017 NORA 2015, WTC 2015, 2016, 2017

- Ph.D. Dissertation Review Committee

Department of Mechanical Engineering, Carleton University, Ottawa, Canada.

FEATURED LECTURES & SEMINARS

“Deposition of Pharmaceutical Aerosol in the Human Nasal Airway” in *the 5th annual Intranasal. Inhaled, and Plumonary Drug Development and Delivery Symposium, Washington DC, 2006.*

“Aerosol Deposition in the Human Extrathoracic and Upper Tracheobronchial Airways” in *Department of Occupational Safety and Health, China Medical University, Taichung, Taiwan, 2009.*

“Aerosol Deposition in the Human Upper Airway” in *College of Pharmacy, University of New Mexico, Albuquerque, New Mexico, 2009*

“Deposition of Pharmaceutical Aerosol in the Human Upper Airway” in *College of Medicine, Chang Gung University, Tao-Yuen, Taiwan, 2009*

“The Application of Human Airway Replicas to the Aerosol Respiratory Deposition Experiments” in *College of Pharmacy, University of New Mexico, Albuquerque, New Mexico, 2010*

“Aerosol Respiratory Deposition” in *College of Public Health, Teaching Excellent Project, Department of Occupational Safety and Health, China Medical University, Taichung, Taiwan, 2012*

“Don't Hold Your Breath: Aerosol-Related Industrial Health Studies at LRRI” in *Rio Grande Section, American Industrial Hygiene Association, Albuquerque, NM, 2012*

“Personal Aerosol Sampling” in *Sandia National Laboratory, Albuquerque, NM, 2016*

“Hold My Breath? - Occupational Health Related Aerosol Research” in *The Mel and Enid Zuckerman College of Public Health, U of Arizona, Tucson, AZ, 2016*

BOOK CHAPTER

Su, W. C. and Y. S. Cheng: Deposition of Man-Made Fibers in the Human Respiratory Airway, in *Asbestos: Risks, Environment and Impact*, (Eds., A. Soto and G. Salazar), Nova Science Publishers, Inc, New York, pp. 1-36, 2009.

PUBLICATIONS

1. Liu, C. M. and **W. C. Su**: A Study of the Correlation Between Ozone Episodes and Regional Meteorological Parameters. *Atmospheric Science (Taiwan)* 25(1): 27-49, 1997.
2. **Su, W. C.** and C. M. Liu: Numerical Simulation of Regional Wind Field and Ozone Episode in the Taipei Metropolitan Area. *Journal of Environmental Protection Society (Taiwan)* 20(2): 25-54, 1997.
3. **Su, W. C.** and J. H. Vincent: New Experimental Studies to Directly Measure Aspiration Efficiencies of Aerosol Samplers in Calm Air. *J. Aerosol Sci.* 33: 103-118, 2002.
4. **Su, W. C.** and J. H. Vincent: Experimental Measurement of Aspiration Efficiency for Idealized Spherical Aerosol Sampler in Calm Air. *J. Aerosol Sci.* 34: 1151-1165, 2003.
5. **Su, W. C.** and J. H. Vincent: Experimental Measurements and Numerical Calculations of Aspiration Efficiency for Cylindrical Thin-Walled Aerosol Samplers in Perfectly Calm Air. *Aerosol Sci. Technol.* 38: 766-781, 2004.
6. **Su, W. C.** and J. H. Vincent: Towards a General Semi-empirical Model for the Aspiration Efficiencies of Aerosol Samplers in Perfectly Calm Air. *J. Aerosol Sci.* 35: 1119-1134, 2004.
7. Cheng, Y. S., H. Irshad, R. McFarland, **W. C. Su**, Y. Zhou, D. Barringer, A.: An Aerosol Wind Tunnel for Evaluation of Massive Flow Air Samplers. *Aerosol Sci. Technol.* 38:1099-1107, 2004.
8. **Su, W. C.** and Y. S. Cheng: Deposition of Fiber in the Human Nasal Airway. *Aerosol Sci. Technol.* 39: 888-901, 2005.
9. Wang, Z, P. K. Hopke, Baron P. A, Ahmadi G., Cheng Y. S., Deye G. and **W. C. Su**: Fiber Classification and the Influence of Average Air Humidity. *Aerosol Sci. Technol.* 39: 1056-1063, 2005.
10. Zamankhan, P., Ahmadi, G., Wang, Z., Hopke, P. K., Cheng, Y. S. and **Su, W.C.**: Airflow and Deposition of Nano-Particles in a Human Nasal Cavity. *Aerosol Sci. Technol.* 40: 463-476, 2006.
11. **Su, W. C.** and Y. S. Cheng: Fiber Deposition Pattern in Two Human Respiratory Tract Replicas. *Inhalation Toxicology.* 18: 749-760, 2006.
12. Irshad, H.; **W. C. Su**, Y. S. Cheng, and F. Medici: Testing of High-Volume Sampler Inlets for the Sampling of Atmospheric Radionuclides. *Health Physics* 91(3): 188-199, 2006.
13. **Su, W. C.** and Y. S. Cheng: Deposition of Fiber in a Human Airway Replica. *J. Aerosol Sci.* 37: 1429-1441, 2006.
14. Foo, M. Y., Y. S. Cheng, **W. C. Su** and M. D. Donovan: The Influence of Spray Properties on Intranasal Deposition. *J. Aerosol Med.* 20(4): 495-508, 2007.
15. Zhou, Y., **W. C. Su** and Y. S. Cheng: Fiber Deposition in the Tracheobronchial Region: Experimental Measurements. *Inhal. Toxicol.* 19(13): 1071-1078, 2007.
16. **Su, W. C.**, J. Wu and Y. S. Cheng: Deposition of Man-made Fiber in a Human Nasal Airway. *Aerosol Sci. Technol.* 42: 173-181, 2008.
17. Zhou, Y., **W. C. Su** and Y. S. Cheng: Fiber Deposition in the Tracheobronchial Region: Deposition Equations. *Inhal. Toxicol.* 20(13): 1191-1198, 2008.

18. **Su, W. C.** and Y. S. Cheng: Deposition of Man-Made Fibers in Human Respiratory Airway Casts. *J. Aerosol Sci.* 40(3): 270-284, 2009.
19. Cheng, Y. S., Y. Zhou, J. Naar, C. M. Irvin, **W. C. Su**, L. E. Fleming, B. Kirkpatrick, R. H. Pierce, L. C. Backer, and D. G. Baden: Personal Exposure to Aerosolized Red Tide Aerosol Toxins (Brevetoxins). *J. Occup. Environ. Hyg.* 7(6): 326-31, 2010.
20. Tolchinsky, A. D., V. I. Sigaev, A. N. Varfolomeev, E. V. Zvyagina, Y. S. Cheng and **W. C. Su**: Newly Developed Liquid Personal Bioaerosol Samplers. *J. Environ. Sci. and Health, Part A.* 46: 1690-1698, 2011.
21. **Su, W. C.**, A. D. Tolchinsky, V. I. Sigaev and Y. S. Cheng: A Wind Tunnel Test of Newly Developed Personal Bioaerosol Samplers. *Journal of the Air & Waste Management Association.* 62(7):828-37, 2012.
22. **Su, W. C.**, A. D. Tolchinsky, B. T. Chen, V. I. Sigaev and Y. S. Cheng: Evaluation of Physical Sampling Efficiency for Cyclone-Based Personal Bioaerosol Samplers in Moving Air Environments. *Journal of Environmental Monitoring.* 14(9): 2430-7, 2012.
23. Cheng, Y. S. and **W. C. Su**: Thoracic Fraction of Inhaled Fiber Aerosol. *Journal of Occupational and Environmental Hygiene.* 10(4): 194-202, 2013.
24. Kim J., J. Xi, X. Si, A. Berlinski, and **W. C. Su**: Hood Nebulization: Effects of Head Direction and Breathing Mode on Inhalability and Deposition in a 7-month-old Infant Model. *Journal of Aerosol Medicine and Pulmonary Drug Delivery.* 26: 1-10, 2013.
25. Xi J., J. W. Kim, X. A. Si, **W. C. Su**, and Y. Zhou: Effects of the facial interface on inhalation and deposition of micrometer particles in calm air in a child airway model. *Inhal. Toxicol.* 26(8): 492-505, 2014.
26. **Su, W. C.** and Y. S. Cheng: Carbon Nanotubes Size Classification, Characterization, and Nasal Airway Deposition. *Inhal. Toxicol.* 26(14):843-852, 2014.
27. **Su, W. C.** and Y. S. Cheng: Estimation of Carbon Nanotubes Deposition in a Human Respiratory Tract Replica. *Journal of Aerosol Science.* 79:72–85, 2014.
28. **Su, W. C.**, B. K. Ku, P. Kulkarni, and Y. S. Cheng: Deposition of Graphene nanoparticle in Human Upper Airways. *Journal of Occupational and Environmental Hygiene.* 13(1):48-59, 2016.
29. Xi, J., J. E. Yuan, M. Alshaiba, D. Cheng, Z. Firlit, A. Johnson, A. Nolan, and **W. C. Su**: Design and Testing of Electric-Guided Delivery of Charged Particles to the Olfactory Region: Experimental and Numerical Studies. *Current Drug Delivery.* 13(2):265-74, 2016.
30. **Su, W. C.**, T. B. Chen, and Y. S. Cheng: Deposition of Multi-walled Carbon Nanotubes (MWCNTs) in Human Nasal, Oral, and Lung Airways. (*in preparation*).

CONFERENCE PRESENTATIONS

1. Liu, C. M. and **Su, W. C.**, “Scenarios of SO₂ and NO_x Emission in Taiwan,” *International Conference on Acid Deposition in East Asia in Taipei, Taiwan, 1996*.
2. **Su, W. C.** and Vincent, J. H., “Experimental Investigation of Aerosol Sampling in Calm Air”, *20th Annual AAAR Conference, Portland, Oregon, 2001*.
3. **Su, W. C.** and Vincent, J. H., “Experimental and Numerical Investigation of Aerosol Sampling in Calm Air”, *The Aerosol Society 13th Annual Conference, Lancaster, UK, 2002*.
4. **Su, W. C.** and Vincent, J. H., “Experimental and Numerical Studies of the Aspiration efficiencies of Aerosol Samplers in Calm air”, *6th International Aerosol Conference, Taipei, Taiwan, 2002*.

5. **Su, W. C.** and Vincent, J. H., “Experimental Measurements of Aspiration Efficiency for Idealized Spherical Aerosol Samplers in Calm Air”, *22th Annual AAAR Conference, Anaheim, California, 2003*.
6. **Su, W. C.**, Zhou, Y. and Cheng, Y. S., “Deposition of Carbon Fiber in A Human Airway Cast”, *24th Annual AAAR Conference, Atlanta, Georgia, 2004*.
7. **Su, W. C.** and Cheng, Y. S., “Deposition of Fiber in the Human Nasal Airway”, *25th Annual AAAR Conference, Austin, Texas, 2005*.
8. **Su, W. C.** and Cheng, Y. S., “Fiber Deposition Pattern in Two Human Respiratory Tracts”, *Frontiers in Aerosol Dosimetry Research Conference, Irvine, California, 2005*.
9. **Su, W. C.** and Cheng, Y. S., “Fiber Deposition in the Human Respiratory Tract”, *National Occupational Research Agenda (NORA) Symposium, Washington, DC, 2006*.
10. **Su, W. C.** and Cheng, Y. S., “Fiber Deposition in the Human Upper Airways”, *7th International Aerosol Conference, St. Paul, Minnesota, 2006*.
11. **Su, W. C.** and Cheng, Y. S., “The Comparison of Fiber Deposition in the Human Nasal Airways”, *26th Annual AAAR Conference, Reno, Nevada, 2007*
12. **Su, W. C.** and Cheng, Y. S., “Deposition of MMVFs in Human Respiratory Airway Casts”, *27th Annual AAAR Conference, Orlando, Florida, 2008*
13. **Su, W. C.** and Cheng, Y. S., “Performance Evaluation of the Newly Developed Personal Bioaerosol Samplers”, *American Industrial Hygiene Conference and Expo, Denver, Colorado, 2010*
14. **Su, W. C.** and Cheng, Y. S., “Performance Evaluation of Three Personal Bioaerosol Samplers”, *29th Annual AAAR Conference, Portland, Oregon, 2010*
15. **Su, W. C.** and Cheng, Y. S., “Wind Tunnel Performance Evaluation for a Fungal Spore Personal Sampler”, *American Industrial Hygiene Conference and Expo, Portland, Oregon, 2011*
16. **Su, W. C.** and Cheng, Y. S., “A New Experimental Method to Measure the Deposition of Carbon Nanotubes in the Human Airway Replica”, *30th Annual AAAR Conference, Orlando, Florida, 2011*
17. **Su, W. C.** and Cheng, Y. S., “Measurement of Carbon Nanotubes deposition in a Human Nasal Airway”, *American Industrial Hygiene Conference and Expo, Indianapolis, Indianan, 2012*
18. **Su, W. C.**, Asgharian B. and Cheng, Y. S., “Deposition of Carbon Nanotubes in a Human Nasal Airway Replica”, *31th Annual AAAR Conference, Minneapolis, Minnesota, 2012*.
19. **Su, W. C.** and Cheng, Y. S., “Deposition of Carbon Nanotubes in a Human Airway Replica”, *American Industrial Hygiene Conference and Expo, Montreal, Canada, 2013*.
20. **Su, W. C.** and Cheng, Y. S., “Deposition of Carbon Nanotubes in the Human Respiratory Tract”, *32th Annual AAAR Conference, Portland, Oregon, 2013*.
21. **Su, W. C.** and Cheng, Y. S., “Deposition of Carbon Nanotube Aerosols in Human Airways”, *9th International Aerosol Conference, Busan, Korea, 2014*.
22. **Su, W. C.** and Cheng, Y. S., “Deposition of Graphene Aerosols in Human Airways”, *American Industrial Hygiene Conference and Expo, Salt Lake City, Utah, 2015*.

CONFERENCE POSTERS

1. **Su, W. C.**, Cheng, Y. S. and Chen, T. H., “Deposition of Multi-Walled Carbon Nanotube (MWCNT) Aerosols in Human Nasal, Oral, and Lung Airways”, *35th Annual AAAR Conference, Portland, Oregon, 2016*.