BIOGRAPHICAL SKETCH

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NAME: Wu, Chang-Yu

eRA COMMONS USER NAME (credential, e.g., agency login): CYWUUFL

POSITION TITLE: Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	END DATE MM/YYYY	FIELD OF STUDY
National Taiwan University, Taipei, Taiwan	BS	06/1989	Mechanical Engineering
University of Cincinnati, Cincinnati, OH	MS	06/1993	Environmental Engineering
University of Cincinnati, Cincinnati, OH	PHD	12/1996	Environmental Engineering
New Jersey Institute of Technology, Jersey City, NJ	Postdoctoral Fellow	08/1998	Mechanical & Chemical Engineering

A. Personal Statement

The goal of this project is to assess aerosolization of multidrug-resistant organisms (MDROs) from sinks and drains in healthcare facilities as a source in order to develop effective strategies to stop their spread. Characterizing aerosols and developing control technologies to mitigate environmental and health effects of airborne chem/bio agents are the key research themes of my research group. I have the unique expertise, experiences and passion in leading such an effort. I have conducted studies to characterize, capture and inactivate bioaerosols (e.g. distribution of virus in aerosol particles, inactivation of bioaerosols by microwave and infrared irradiation), and I have developed methods or devices for collecting them (e.g. personal sampler, bioaerosol amplification unit). Besides, I have tracked records of successfully executing research projects from various agencies (e.g. NSF, DTRA, AFRL, EPA, NIH) with productive outcomes. I have published a series of refereed articles and patents (and pending patent applications) in this subject area. I have also organized sessions in conferences devoted to this subject. I am extremely enthusiastic about this research endeavor, and I am thrilled by the opportunity of working with Drs. Adriana Jimenez, Roberto Ruiz-Cordero, Frank Guido-Sanz, and Latoya Lewis, who share the same passion and who have the complementary expertise, to address this grandiose challenge. In summary, I have a demonstrated record of conducting successful and productive research projects in characterizing bioaerosol, assessing exposure to airborne pathogens, and developing devices for collecting airborne chem/bio agents. My expertise and experiences have well prepared me to function as a PI of the proposed project.

1. Vass WB, Shirkhani A, Washeem M, Shankar SN, Zhang Y, Moquin TL, Messcher RL, Jansen MD, Clugston JR, Walser MP, Yang Y, Lednicky JA, Fan ZH, Wu CY. Occupational exposure monitoring of airborne respiratory viruses in outpatient medical clinics. Aerosol Sci Technol. 2024 Oct 23; PubMed Central PMCID: PMC12266680.
2. Prins C, Bollinger AE, Johnson CL, Pomeranz JL, Bethart SM, Cherabuddi K, Horgas AL, Venugopalan V, Marlow NM, Agdas D, Wu CY, Jutla AS, Khan M, Charles A, Burke AC, Lee Revere F. Infection prevention and control in long-term care facilities in Florida: A needs assessment survey. Am J Infect Control. 2025 Feb;53(2):210-221. PubMed PMID: 39447646.
3. Vass WB, Shankar SN, Lednicky JA, Alipanah M, Stump B, Keady P, Fan ZH, Wu CY. Concentrating viable airborne pathogens using a virtual impactor with a compact water-based condensation air sampler. Aerosol Sci Technol. 2024;58(10):1114-1128. PubMed Central PMCID: PMC11530212.
4. Chen Y, Chen J, Shankar SN, Amanatidis S, Eiguren-Fernandez A, Kreisberg N, Spielman S,

Lednicky JA, Wu CY. The BioCascade Impactor: A novel device for direct collection of size-fractionated bioaerosols into liquid medium. Aerosol Sci Technol. 2024;58(3):264-275. PubMed Central PMCID: PMC11067687.

B. Positions, Scientific Appointments and Honors

Positions and Scientific Appointments

2023 -	Professor, University of Miami, Dept. Chem. Environ. Mat. Eng., Coral Gables, FL
2023 -	Department Chair, University of Miami, Dept. Chem. Environ. Mat. Eng., Coral Gables, FL
2023 -	Director, Center for Aerosol Science & Technology, Coral Gables, FL
2018 - 2018	Technical Program co-Chair, 10th International Aerosol Conference, St. Louis, MO
2013 - 2019	Department Head, University of Florida, Dept. Environ. Eng. Sci., Gainesville, FL
2009 - 2022	Professor, University of Florida, Dept. Environ. Eng. Sci., Gainesville, FL
2009 - 2009	Conference Chair, 28th Annual Meeting of the American Assoc. Aerosol Research, Minneapolis, MN
2006 - 2022	Editorial Advisory Board Member, Aerosol & Air Quality Research
2004 - 2009	Associate Professor, University of Florida, Dept. Environ. Eng. Sci., Gainesville, FL
1998 - 2004	Assistant Professor, University of Florida, Dept. Environ. Eng. Sci., Gainesville, FL

Honors

2021 - 2023	ESSIE Excellence Term Professorship, University of Florida
2024	Susanne Hering Award, American Association for Aerosol Research
2019	Fellow, American Association for Aerosol Research
2015	John J. McCreary Outstanding Faculty Award, Society of Environmental Engineers
2015	Lyman A. Ripperton Environmental Educator Award, Air & Waste Management Association
2011	Elmer L. Hann Award, The Society of Naval Architects and Marine Engineers
2007	Space Act Award, MSC-23624-1,, National Aeronautics and Space Agency
2006	Air Force Summer Research Fellow, Air Force Research Laboratory
2006	HHMI Distinguished Mentor Award, Science for Life Program at University of Florida
2004	New Researcher Award, Southeastern Section of American Society for Engineering Education
2001	J. Environmental Engineering Editor's Award, American Society of Civil Engineers

C. Contribution to Science

1. Infectious airborne biological agents post significant health effects. Understanding their behavior is critical to the better protection of human health. I have conducted studies to assess how environmental parameters affect their viability, transport as well as distribution in aerosol particles. Our research revealed how aerosol particles shield viruses from environmental stress factors. I was the PI or co-PI of these studies.
   a. Santarpia JL, Reid JP, Wu C, Lednicky JA, Oswin HP. The aerobiological pathway of natural respiratory viral aerosols. TrAC Trends in Analytical Chemistry. 2024 March; 172:117557. Available from: https://doi.org/10.1016/j.trac.2024.117557
   b. Usmani M, Brumfield KD, Magers B, Zhou A, Oh C, Mao Y, Brown W, Schmidt A, Wu CY, Shisler JL, Nguyen TH, Huq A, Colwell R, Jutla A. Building Environmental and Sociological Predictive Intelligence to Understand the Seasonal Threat of SARS-CoV-2 in Human Populations. Am J Trop Med Hyg. 2024 Mar 6;110(3):518-528. PubMed Central PMCID: PMC10919182.
   c. Li H, Shankar SN, Witanachchi CT, Lednicky JA, Loeb JC, Alam MM, Fan ZH, Mohamed K, Eiguren-Fernandez A, Wu CY. Environmental Surveillance and Transmission Risk Assessments

for SARS-CoV-2 in a Fitness Center. Aerosol Air Qual Res. 2021 Nov;21(11) PubMed Central PMCID: PMC8765736.

d. Pan M, Carol L, Lednicky JA, Eiguren-Fernandez A, Hering S, Fan ZH, Wu CY. Determination of the distribution of infectious viruses in aerosol particles using water-based condensational growth technology and a bacteriophage MS2 model. Aerosol Sci Technol. 2019;53(5):583-593. PubMed Central PMCID: PMC6663101.

2. Bioaerosols have properties that require unique consideration in developing effective measures to control them. Guided by fundamental understanding how bioaerosols respond to environmental parameters, my research team has developed various technologies that can effectively disinfect bioaerosols with various constraints. I was the PI of these studies.
   a. Ali A, Pan M, Tilly TB, Zia M, Wu CY. Performance of silver, zinc, and iron nanoparticles-doped cotton filters against airborne E. coli to minimize bioaerosol exposure. Air Qual Atmos Health. 2018;11(10):1233-1242. PubMed Central PMCID: PMC6209029.
   b. Damit B, Wu C, Yao M. Ultra-high temperature infrared disinfection of bioaerosols and relevant mechanisms. Journal of Aerosol Science. 2013 November 01; 65:88-100. Available from: http://www.sciencedirect.com/science/article/pii/S0021850213001687 issn: 0021-8502
   c. Woo M, Grippin A, Wu C, Wander J. Microwave-Irradiation-Assisted HVAC Filtration for Inactivation of Viral Aerosols. Aerosol and Air Quality Research. 2012; 12:295-303. Available from: http://dx.doi.org/10.4209/aaqr.2011.11.0193
   d. Woo MH, Grippin A, Anwar D, Smith T, Wu CY, Wander JD. Effects of relative humidity and spraying medium on UV decontamination of filters loaded with viral aerosols. Appl Environ Microbiol. 2012 Aug;78(16):5781-7. PubMed Central PMCID: PMC3406129.
3. Health effects of particulate matter are dependent on its composition which is influenced by its sources as well as its transformation in the atmosphere. I have conducted, lab-based experiments, field sampling and modeling to characterize the composition and assess the corresponding exposure risk. I was the PI of these studies.
   a. Afshar-Mohajer N, Wu C, Ladun T, Rajon D, Huang Y. Characterization of particulate matters and total VOC emissions from a binder jetting 3D printer. Building and Environment. 2015 November 01; 93:293-301. Available from: http://www.sciencedirect.com/science/article/pii/S0360132315300615 issn: 0360-1323
   b. Chien CH, Huang G, Lopez B, Morea A, Sing SY, Wu CY, Kashon ML, Harper M. Application of end-of-shift respirable crystalline silica monitoring to construction. J Occup Environ Hyg. 2020 Sep;17(9):416-425. PubMed PMID: 32749920.
   c. Chien C, Zhou C, Wei H, Sing S, Theodore A, Wu C, Hsu Y, Birky B. Feasibility test of cellulose filter for collection of sulfuric acid mists. Separation and Purification Technology. 2018 April 29; 195:398-403. Available from: http://www.sciencedirect.com/science/article/pii/S1383586617324231 issn: 1383-5866
   d. Manzanas C, Alam MM, Loeb JC, Lednicky JA, Wu CY, Fan ZH. A Valve-Enabled Sample Preparation Device with Isothermal Amplification for Multiplexed Virus Detection at the Point-of-Care. ACS Sens. 2021 Nov 26;6(11):4176-4184. PubMed Central PMCID: PMC8609915.
4. Aerosol toxicity is a seminal factor in assessing health risks. We have developed a novel system that allows more physiologically relevant exposure to aerosolized chem/bio agents to better characterize their toxicity than the conventional approaches do. We have also applied the system for understanding health effects of various scenarios. I am the PI or co-PI of these studies.
   a. Shankar SN, O'Connor A, Mital K, Zhang Y, Theodore A, Shirkhani A, Amanatidis S, Lewis GS, Fernandez AE, Tilly TB, Schmid O, Sabo-Attwood T, Wu CY. Cellular responses of lung cells cultured at an Air-liquid Interface are influenced by spatial nanoparticle deposition patterns in an in vitro aerosol exposure system. Aerosol Sci Technol. 2025;59(10):1198-1209. PubMed Central PMCID: PMC12490821.
   b. O'Connor A, Villalobos Santeli A, Nannu Shankar S, Shirkhani A, Baker TR, Wu CY, Mehrad B,

Ferguson PL, Sabo-Attwood T. Toxicity of microplastic fibers containing azobenzene disperse dyes to human lung epithelial cells cultured at an air-liquid interface. J Hazard Mater. 2024 Dec 5;480:136280. PubMed Central PMCID: PMC11698483.

c. Tilly TB, Ward RX, Morea AF, Nelson MT, Robinson SE, Eiguren-Fernandez A, Lewis GS, Lednicky JA, Sabo-Attwood T, Hussain SM, Wu CY. Toxicity assessment of CeO_2 and CuO nanoparticles at the air-liquid interface using bioinspired condensational particle growth. Hyg Environ Health Adv. 2023 Sep;7 PubMed Central PMCID: PMC10500621.

d. Ward RX, Tilly TB, Mazhar SI, Robinson SE, Eiguren-Fernandez A, Wang J, Sabo-Attwood T, Wu CY. Mimicking the human respiratory system: Online in vitro cell exposure for toxicity assessment of welding fume aerosol. J Hazard Mater. 2020 Aug 5;395:122687. PubMed Central PMCID: PMC7276288.

5. The ability to detect a chem/bio agent is a foundational skill needed for risk assessment and setting mitigation strategy. We have developed on-the-spot detection for agents as well as established sensor network for characterizing temporal-spatial distribution of pollutants. I was the PI or co-PI of these studies.

a. Afshar-Mohajer N, Wu C. Use of a drone-based sensor as a field-ready technique for short-term concentration mapping of air pollutants: A modeling study. Atmospheric Environment. 2023 February 01; 294:119476. Available from: https://www.sciencedirect.com/science/article/pii/S1352231022005416 issn: 1352-2310

b. Jiang X, Loeb JC, Pan M, Tilly TB, Eiguren-Fernandez A, Lednicky JA, Wu CY, Fan ZH. Integration of sample preparation with RNA-Amplification in a hand-held device for airborne virus detection. Anal Chim Acta. 2021 Jun 22;1165:338542. PubMed Central PMCID: PMC8325109.

c. Li J, Zhang H, Chao C, Chien C, Wu C, Luo C, Chen L, Biswas P. Integrating low-cost air quality sensor networks with fixed and satellite monitoring systems to study ground-level PM2.5. Atmospheric Environment. 2020 February 15; 223:117923. Available from: https://doi.org/10.1016/j.atmosenv.2020.117293 DOI: 10.1016/j.atmosenv.2020.117293

d. Bonny TS, Driver JP, Paisie T, Salemi M, Morris JG, Shender LA, Smith L, Enloe C, Oxenrider K, Gore JA, Loeb JC, Wu CY, Lednicky JA. Detection of Alphacoronavirus vRNA in the Feces of Brazilian Free-Tailed Bats (Tadarida brasiliensis) from a Colony in Florida, USA. Diseases. 2017 Feb 27;5(1) PubMed Central PMCID: PMC5456339.