# Yu Feng, Ph.D.


## CONTACT INFORMATION

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Lab Website: www.cbbl-okstate.com


## MAJOR AREAS OF RESEARCH INTEREST

Advanced Modeling of Computational Fluid-Particle Dynamics, Lung Aerosol Dynamics, Occupational Exposure Health Risks Assessment, Direct Drug-Targeting Delivery

## EDUCATION

North Carolina State University, Raleigh, NC, USA — August 2013
**Ph. D. in Mechanical Engineering, Minor in Mathematics**

- **Ph.D. Dissertation:** "Computational Ellipsoidal Particle-Fluid Analysis and Discrete Element Method with Applications to Particle Transport and Deposition in Human Respiratory Models."
- **Relevant Coursework**: Modern Fluid Dynamics, Principle of Structure Vibration, Computational Fluid Mechanics, Heat Transfer Theory and Applications, Discrete Element Method
- **Advisor:** Dr. Clement Kleinstreuer

North Carolina State University, Raleigh, NC, USA — May 2010
**M.S. in Mechanical Engineering, Minor in Mathematics**

- **Master Thesis:** "A New Thermal Conductivity Model for Nanofluids with Convection Heat Transfer Application"
- **Relevant Coursework:** Particle Differential Equations, Finite Element Partial Differential Equations, Finite Element Analysis, Advanced Solid Mechanics, Microfluidics, Continuum Mechanics, C++ and Data Structures
- **Advisor:** Dr. Clement Kleinstreuer
- McDonald-Kleinstreuer Fellowship

Zhejiang University, Hangzhou, China — First-class graduate
**B.S. in Engineering Mechanics** — June 2007

- **Bachelor Thesis:** "Brownian Coagulation Efficiency of Spherical Dioctyl Phthalate Aerosol Particles during Collisions"
- **Advisor:** Dr. Jian-Zhong Lin

Hong Kong Polytechnic University, Hong Kong, China — August 2005-January 2006
**Exchange Student in Mechanical Engineering**

## POSITIONS AND EMPLOYMENT

**Associate Professor** — July 2022 - Present
School of Chemical Engineering
Oklahoma State University, Stillwater, OK, USA

**Assistant Professor** June 2016-June 2022
School of Chemical Engineering
Oklahoma State University, Stillwater, OK, USA

**Center Investigator** June 2016-Present
Oklahoma Center for Respiratory and Infectious Disease (OCRID)
Stillwater, OK, USA

**Research Scientist II - Structural/Fluid Mechanics** December 2015- June 2016
DoD Biotechnology HPC Software Applications Institute
Frederick, MD, USA

**Research Assistant Professor and Lab Manager** May 2015-December 2015
Department of Mechanical and Aerospace Engineering
North Carolina State University, Raleigh, NC, USA

**Research Associate and Lab Manager** August 201-May 2015
Department of Mechanical and Aerospace Engineering
North Carolina State University, Raleigh, NC, USA

## FUNDED RESEARCH PROJECTS

**Ongoing Funded Projects**

**Title:** Modeling Transmission Aerobiology of SARS-CoV-2 Aerosols in Human and Mouse Lungs
**Granting Agency:** National Institutes of Health (NIH) (P20GM103648)
**Grant Period:** 09/01/2022-06/31/2023
**Role:** Principal Investigator
**Total Cost:** $50,000

**Title:** Determining the Effect of Airway Deformation on Pulmonary Air-Particle Dynamics
**Granting Agency:** National Science Foundation (NSF)
**Grant Period:** 07/01/2021-06/31/2024
**Role:** Principal Investigator
**Total Cost**: $249,959

**Title:** Understanding the effects of sphero-cylinder drug particle shape to enhance small-airway drug delivery for better emphysema treatment outcomes
**Granting Agency:** Oklahoma Center for the Advancement of Science & Technology (OCAST)
**Grant Period:** 09/01/2019 to 08/31/2022
**Role:** Principal Investigator
**Direct Cost:** $135,000

**Title:** Flow control strategies for protection of aircraft passengers and workers against SARS-CoV-2
**Granting Agency:** Centers for Disease Control and Prevention (CDC)
**Grant Period:** 04/01/2021-03/31/2023
**Role:** Co-Investigator
**Total Cost:** $393,687.00

**Title:** Predicting Health Endpoints of Inhaled Nicotine/THC-Containing Aerosols in Human and Rat Respiratory Tracts to Optimize the Therapeutic Effects using CFPD-PBTK Models
**Granting Industry Company:** Spectrum Dynamics Research Inc., Pheonix, AZ, USA
**Grant Period:** 04/01/2021-03/31/2023
**Role:** Principal Investigator
**Total Amount:** $159,994.00

**Completed Funded Projects**

**Title:** DPI In-Silico Modeling - Predict Dry Powder Performance and Subsequent Depositions in a Whole-Lung Model
**Granting Industry Company:** Cipla R&D Center, Mumbai, India
**Grant Period:** 09/01/2019 to 03/31/2021
**Role:** Principal Investigator
**Direct Cost:** $109,094

**Title:** Evaluation of COVAS Effectiveness on the Clearance of the COVID-19 Aerosols in a Patient Room
**Granting Industry Company:** QuantBet Inc., England
**Grant Period:** 05/01/2020 to 08/21/2020
**Role:** Principal Investigator
**Total Amount:** $13,758

**Title:** Mitigating infection risks to airborne SARS-CoV-2 laden aerosols in a patient room via portable air sanitizers and smart ventilation control
**Granting Agency:** CDC/NIOSH/ SWCOEH (T42OH008421)
**Grant Period:** 11/01/2020 to 06/30/2021
**Role:** Mentor (The Principal Investigator is Jianan Zhao, previous Ph.D. student in Dr. Feng's lab)
**Total Award Amount:** $10,000

**Title:** CFD Simulations of Heat and Mass Transfer Performance of a Regeneration Process
**Granting Industry Company:** Exterran Corporation Product and Technology Center, Tulsa, OK, USA
**Grant Period:** 11/07/2018 to 02/15/2019
**Role:** Principal Investigator
**Total Award Amount:** $55,685

**Title:** A Precise Scale-up Method from Mice to Men on the Infection of Influenza A Virus
**Granting Agency:** National Institutes of Health (NIH) (P20GM103648)
**Grant Period:** 11/01/2018 to 06/30/2019
**Role:** Principal Investigator
**Total Award Amount:** $50,000

**Title:** A Virtual Human System for Health Risk Assessments in a Representative Whole-lung Configuration Associated with Welding Fume Exposure
**Granting Agency:** CDC/NIOSH/ SWCOEH (T42OH008421)
**Grant Period:** 01/30/2018 to 06/30/2018
**Role:** Principal Investigator
**Total Award Amount:** $10,800

**Title:** Multi-scale Dosimetry Modeling of Influenza Virus-Laden Droplets through the Pulmonary Route
**Granting Agency:** National Institutes of Health (NIH) (P20GM103648)
**Grant Period:** 07/01/2016 to 06/30/2018
**Role:** Principal Investigator
**Total Award Amount:** $100,000

## ESTABLISHED ACADEMIC PARTNERSHIPS

**CBBL-Ansys Academic Partnership (2016 to Present)**

Our research group formed an academic partnership with Ansys Inc. (Pittsburg, PA) in 2016, to extend lung aerosol dynamics modeling to the cell level. As a result of the new partnership, Ansys Inc. provides our group **free computational licenses ($89,000 per year)** of the entire ANSYS suite of mechanical, computational fluid dynamics, and multiphysics software:

- 5 ANSYS academic research mechanical and CFD (5 tasks)
- 128 ANSYS Academic Research HPC (per core)
- 3 ANSYS Academic SpaceClaim Tools (5 tasks)
- 2 ANSYS Academic Meshing Tools (5 Tasks)
- Ensight (5 Tasks)

**CBBL-ESSS Academic Partnership (2017 to Present)**

Our research group formed a new academic partnership with ESSS Inc. (Woburn, MA), to model and understand the underlying physics of interactions among irregularly shaped elastic particles using Discrete Element Method (DEM). associated with multiple applications towards pulmonary health care and occupational exposure risk assessments. As a result of the new partnership, ESSS provides Dr. Yu Feng's group Rocky DEM Academic licenses with GPU acceleration capabilities (worth **$160,000 per year**).

## TEACHING EXPERIENCE

**School of Chemical Engineering, Oklahoma State University**

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|---|---|
| CHE5743 - Chemical Engineering Process Modeling | Fall 2016, 2017 |
| CHE4990/5990 - Computational Fluid-Particle Dynamics: Basic Theory and Select Chemical and Biomedical Applications | Spring 2017, 2021 |
| CHE4002 - Unit Operation Lab I | Spring 2018, 2019, 2020,2022 |
| CHE4112 - Unit Operation Lab II | Fall 2018, 2019, 2020, 2021,2022 |
| CHE6010 - Chemical Engineering Seminar | Fall 2019, Spring 2020 |

## GRADUATE STUDENTS MENTORED

Rashed Islam (Ph.D. student), Oklahoma State University, 08/2021 to Present

Ted Sperry (Ph.D. Student), Oklahoma State University, 08/2019 to Present
Hamideh Hayati (Ph.D. Student), Oklahoma State University, 08/2018 to Present
Jianan Zhao (Ph.D. Student), Oklahoma State University, 08/2017 to 08/2021
Hang Yi (Ph.D. Student), Oklahoma State University, 08/2016 to 12/2020
Max Kozak (M.S. Student), Oklahoma State University, 08/2017 to 08/2019
Ahmadreza Haghnegahdar (M.S. Student), Oklahoma State University, 01/2017 to 12/2019

## UNDERGRADUATE STUDENTS MENTORED

Blake A. Bartlett, Oklahoma State University, 05/2021 to Present (Wentz Scholarship)
Sydney Turner, Oklahoma State University, 06/2020 to Present
Avery Sessom, Oklahoma State University, 08/2019 to 08/2020
Ted Sperry, Oklahoma State University, 08/2018 to 06/2019

## HIGH SCHOOL STUDENT MENTORED

Benjamin Li, North Carolina School of Science and Mathematics, 04/2021 to Present

## PUBLICATIONS (IN RANK)

*Symbols: co-first author* (†)*, advised graduate student* (*)*, advised undergraduate student* (**)*, corresponding author* (+)

**Publications**

*Journal Papers (In Press)*

[2] Kolewe, E., Padhye, E., Woodward, I., Wee, J., Rahman, T., b, Briddell, J., Fromen, C. (2022). Spatial aerosol deposition correlated to anatomic feature development in 6-year-old upper airway computational models, Journal of Applied Physiology (under review).

[1] Sun, Y., Yu, D., Li, J., Zhao, J., **Feng, Y.**, Zhang, X., Mao, S. (2022). Elucidation of lactose fine size and drug shape on rheological properties and aerodynamic behavior of dry powders for inhalation. *European Journal of Pharmaceutics and Biopharmaceutics* (under review).

*Journal Papers Published (In Rank)*

[32] Wang, J., Zhang, Y., Chen, X., **Feng, Y.**, Ren, X., Yang, M., Ding, T. (2022). Targeted Delivery of Inhalable Drug Particles in a Patient-Specific Tracheobronchial Tree with Moderate COVID-19: A Numerical Study. *Powder Technology, 405,* 117520

[31] Yi, H. [*], **Feng, Y.** [+], Fahlenkamp, H. (2022). Analysis of Topical Dosing and Administration Effects on Ocular Drug Delivery in a Human Eyeball Model using Computational Fluid Dynamics. *Computers in Biology and Medicine,* 141, 105016

[30] Zhao, J.[*], Haghnegahdar, A., **Feng, Y.**[+], Patil, A., Kulkarni, N., Singh, G. J. P., Malhotra, G., Bharadwaj, R. (2022). Prediction of the Carrier Shape Effect on Particle Transport, Interaction and Deposition in Two Dry Powder Inhalers and a Mouth-to-G13 Human Respiratory System: A CFD-DEM Study. *Journal of Aerosol Science,* 160, 105899

[29] Li, B. *, **Feng, Y.**+ (2022). In Silico Study to Enhance Delivery Efficiency of Charged Nanoscale Nasal Spray Aerosols to the Olfactory Region Using External Magnetic Fields. *MDPI Bioengineering, 9(1)*, 40.

[28] Hu, P., Cai, C., Yi, H. *, Zhao, J. *, **Feng, Y.**+, Wang, Q. (2022). Aid Airway Obstruction Diagnosis with Computational Fluid Dynamics and Convolutional Neural Network: A New Perspective and Numerical Case Study. *ASME Journal of Fluids Engineering, 144,* 081206

[27] Zhao, J. *, **Feng, Y.** +, Koshiyama, K., Wu, H. (2021). Prediction of Airway Deformation Effect on Pulmonary Air-Particle Dynamics: A Numerical Study. *Physics of Fluids, 33,* 101906

[26] Zhao, J. *, **Feng, Y.** +, Tian, G., Taylor, C., Arden, S. N. (2021). Influences of Puff Protocols and Upper Airway Anatomy on Cannabis Pharmacokinetics: A CFPD-PK Study. *Computers in Biology and Medicine*, 132, 104333

[25] Yi, H. *, Wang, Q., **Feng, Y.** + (2021). Computational analysis of chronic obstructive pulmonary disease (COPD) and expiration intensity effects on the cough-driven mucus movement and clearance in an idealized upper airway model using Volume of Fluid (VOF) method. *Physics of Fluids, 33,* 021903

[24] **Feng, Y.**+, Zhao, J. *, Spinolo, M., Lane, K., Laung, D., Marshall, D., Mlinaric, P. (2021). Assessing the Filtration Effectiveness of an Air Sanitizer on Airborne SARS-CoV-2 Laden Droplets in a Patient Room: A CFPD Study. *Aerosol and Air Quality Research, 21(5)*, 20608

[23] **Feng, Y.**+, Zhao, J. *, Hayati, H. *, Sperry, T. *, Yi, H. * (2021). Tutorial: Understanding the transport, deposition, and translocation of particles in human respiratory systems using Computational Fluid-Particle Dynamics and Physiologically Based Toxicokinetic models. *Journal of Aerosol Science, 151, 105672*

[22] Ford Versypt, A. N., Carpenter, S. L., Adkins, T. L., Sperry*, T. A., **Feng, Y.** (2021). Kidney and Lung Demonstrations to Introduce Engineering Concepts to Middle School Students and Their Grandparents *ASEE*. https://peer.asee.org/37415

[21] Zhao, J. *, **Feng, Y.** +, Tian, G., Taylor, C., Arden, S. N. (2021). Influences of Puff Protocols and Upper Airway Anatomy on Cannabis Pharmacokinetics: A CFPD-PK Study. *Computers in Biology and Medicine*, 132, 104333

[20] Hayati, H. *, **Feng, Y.** +, Hinsdale, M. (2021). Inter-species Variabilities of Droplet Transport, Size Change, and Deposition in Human and Rat Respiratory Systems: An *In Silico* Study, *Journal of Aerosol Science, 154,* 105761

[19] Yi, H. *, Wang, Q., **Feng, Y.** + (2021). Computational analysis of chronic obstructive pulmonary disease (COPD) and expiration intensity effects on the cough-driven mucus movement and clearance in an idealized upper airway model using Volume of Fluid (VOF) method. *Physics of Fluids, 33,* 021903

[18] **Feng, Y.** +, Zhao, J. *, Spinolo, M., Lane, K., Laung, D., Marshall, D., Mlinaric, P. (2021). Assessing the Filtration Effectiveness of an Air Sanitizer on Airborne SARS-CoV-2 Laden Droplets in a Patient Room: A CFPD Study. *Aerosol and Air Quality Research, 21(5)*, 20608

[17] **Feng, Y.** +, Zhao, J. *, Hayati, H. *, Sperry, T. *, Yi, H. * (2021). Tutorial: Understanding the transport, deposition, and translocation of particles in human respiratory systems using Computational Fluid-Particle Dynamics and Physiologically Based Toxicokinetic models. *Journal of Aerosol Science, 151, 105672*

[16] Kolewe, E., **Feng, Y.**, Fromen, C. (2020). Realizing Lobe-Specific Aerosol Targeting in a 3D Printed In Vitro Lung Model. *Journal of Aerosol Medicine and Pulmonary Drug Delivery,* 33(0)

[15] Chen, X., Zhou, X., Xia, X., Xie, X., Lu, P., **Feng, Y.** (2020). Modeling of the transport, hygroscopic growth, and deposition of multi-component droplets in a simplified airway with realistic thermal boundary conditions. *Journal of Aerosol Science, 151,* 105626

[14] **Feng, Y.**$^{+}$, Marchal, T., Sperry, T. *, Yi, H. * (2020). Influence of Wind and Relative Humidity on the Social Distancing Effectiveness to Prevent COVID-19 Airborne Transmission: A Numerical Study. *Journal of Aerosol Science, 147,* 105585

[13] Yi, H. *, **Feng, Y.**$^{+}$, Park, H., Wang, Q. (2020). Configuration predictions of large liquefied petroleum gas (LPG) pool fires using CFD method. *Journal of Loss Prevention in the Process Industries, 116*, 104099

[12] Zhao, J.*, **Feng, Y.**$^{+}$**,** Fromen, C. (2020). Glottis Motion Effects on the Inhaled Particle Transport and Deposition in a Subject-Specific Mouth-to-Trachea Model: An in silico Study. Computers in Biology and Medicine. *116*, ID: 103532.

[11] Zhao, J.*, **Feng, Y.**$^{+}$**,** Bezerra, M., Wang, J., Sperry, T. (2019). Numerical Simulation of Welding Fume Lung Dosimetry. *Journal of Aerosol Science. 135,* 113-129

[10] Yi, H.*, **Feng, Y.**$^{+}$**,** Wang, Q. (2019). Computational Fluid Dynamics (CFD) Study of Heat Radiation from Large Liquefied Petroleum Gas (LPG) Pool Fires. *Journal of Loss Prevention in the Process Industries*. *61,* 262-274

[9] Haghnegahdar, A.*, Zhao, J.*, **Feng, Y**.$^{+}$ (2019). Lung aerosol dynamics of airborne influenza A virus-laden droplets and the resultant immune system responses: An in silico study. *Journal of Aerosol Science, 134,* 34-55

[8] Haghnegahdar, A.*, Zhao, J.*, Kozak, M.*, Williamson, P., **Feng, Y.** $^{+}$(2019). Development of a Hybrid CFD-PBPK Model to Predict the Transport of Xenon Gas Around a Human Respiratory System to Systemic Regions. *Heliyon, 5*(4)*,* e01461

[7] Amer, M., Ramsey, J., **Feng, Y.** (2019). Using CFD Simulations and Statistical Analysis to Correlate Oxygen Mass Transfer Conditions in a Stirred0Tank Bioreactor. *Biotechnology Progress, 35*(3), e2785

[6] **Feng. Y.**$^{+}$, Zhao, J.*, Kleinstreuer, C., Wang, Q., Wang, J., Wu, D.H., Lin, J. (2018). An in silico Inter-subject Variability Study of Extra-thoracic Morphology Effects on Inhaled Particle Transport and Deposition. *Journal of Aerosol Science*, *123*, 185-207.

[5] Haghnegahdar, A.*, **Feng, Y.**$^{+}$, Chen, X., & Lin, J. (2018). Computational analysis of deposition and translocation of inhaled nicotine and acrolein in the human body with e-cigarette puffing topographies. *Aerosol Science and Technology*, *52*(5), 483-493.

[4] Chen, X., Zhong, W., Kleinstreuer, C. **Feng, Y.**, (2018). Effects of thermal airflow and mucus-layer interaction on hygroscopic droplet deposition in a simple mouth-throat model. *Aerosol Science and Technology. 52(8), 900-912*

[3] **Feng, Y.**$^{+}$**,** Zhao, J.*, Chen, X., Lin, J. (2017). An In Silico Subject-Variability Study of Upper Airway Morphological Influence on the Airflow Regime in a Tracheobronchial Tree. *Bioengineering*, 4(4), 90.

[2] Chen, X., **Feng, Y.,** Zhong W., Sun, B., Tao, F. (2017). Numerical Investigation of Particle Deposition in a Triple Bifurcation Airway due to Gravitational Sedimentation and Inertial Impaction. *Powder Technology*, 323, 284-293.

[1] Chen, X., **Feng, Y.**, Zhong, W., Kleinstreuer, C. (2016). Numerical investigation of the interaction, transport and deposition of multicomponent droplets in a simple mouth-throat model, *Journal of Aerosol Science*. 105, 108-127

*Book Chapter Published (In Rank)*

[2] **Feng, Y.**$^{+}$, Hayati, H.*, Bates, A., Koch, W., Lehner, M., Benda, O., Ortiz, R., Koch, G. (2021). Clinical CFD Applications 2. In: Inthavong K., Singh N., Wong E., Tu J. (eds) Clinical and Biomedical Engineering in the Human Nose. Biological and Medical Physics, Biomedical Engineering. Springer, Singapore. https://doi.org/10.1007/978-981-15-6716-2_10

[1] **Feng, Y.**[+], Xu, Z., & Haghnegahdar, A.[*] (2016). Computational Fluid-Particle Dynamics Modeling for Unconventional Inhaled Aerosols in Human Respiratory Systems, Aerosols - Science and Case Studies, Dr. Volkov Konstantin (Ed.), InTech, DOI: 10.5772/65361

*Unrefereed/Internet Publications (In Rank)*

[6] Jianan Zhao*, **Feng, Y.**[+] (2019). Prediction of drug particle transport in a dry powder inhaler using Rocky DEM. https://rocky.esss.co/blog/prediction-of-drug-particle-transport-in-a-dry-powder-inhaler-using-rocky-dem

[5] **Feng, Y.** [+], Chen, X., Yang, M., Dong, K. (2019). Editorial: Multiscale Computational Models for Respiratory Aerosol Dynamics with Medical Applications. *Computational and Mathematical Methods in Medicine (SI),* ID: 4304139

[4] Lin, J., Yu, M., Seipenbusch, M., Ku, X., **Feng, Y.** (2019). Editorial: Nanofluidics and Nanofluids. *Journal of Nanotechnology (SI)*, ID: 8767624

[3] **Feng, Y.**[+] (2018). Targeting a tumor. *ANSYS Advantage, Issue 2. https://www.ansys.com/about-ansys/advantage-magazine/volume-xii-issue-2-2018/targeting-a-tumor*

[2] **Feng, Y.**[+], Chen, X., Zhao, J [*]. (2018). Create the individualized digital twin for noninvasive precise pulmonary healthcare. Significances of Bioengineering & Biosciences, SBE.000507.

[1] Lin J., Yu, M., Seipenbusch, M., Ku, **Feng, Y.** (2018). Editorial: Nanofluidics and Nanofluids. *Journal of Nanotechnology, Special Issue: Nanofluidics and Nanofluids.*

## Presentations

*Invited Lectures*

[21] **Feng, Y.**, Zhao, J., Haghnegahdar, A., Bharadwaj, R. (2022). An In Silico Modeling Framework to Predict Particle Dynamics in Dry Powder Inhalers. Respiratory Drug Delivery 2022, Orlando, FL, USA.

[20] **Feng, Y.** (2022). Computational Fluid Dynamics based Digital Twin System for Pulmonary Healthcare. Health and Life Sciences Technology Showcase, Tulsa, OK, USA.

[19] **Feng, Y.** (2021). Developing the Next-Generation Elastic Whole-Lung Model using Computational Fluid Particle Dynamics. INTERACT Research Symposium 2021, Stillwater, OK, USA

[18] **Feng, Y.** (2021). A Disease-specific "All-in-One" Modeling Framework to Predict IVIVCs of orally inhaled drug products (OIDPs). Triple Helix Expertise Exchange Workshop On Modeling Drug-Device Interaction (Virtual Presentation)

[17] **Feng, Y.** (2021). Developing the Next-Generation Virtual Lung Model using Computational Fluid Particle Dynamics. Baylor University (Virtual Presentation)

[16] **Feng, Y.** (2021). Invited Tutorial: Dynamic Modeling of Aerosol Transport, Deposition, and Translocation in Human Respiratory Systems. AAAR 2021 (Virtual Presentation)

[15] **Feng, Y.** (2020). Paving the way to the Next-Generation Virtual Lung Model for Exposure Risk Assessment. Department of Occupational and Environmental Health, Hudson College of Public Health, University of Oklahoma, Oklahoma City, OK.

[14] **Feng, Y.** (2020). Towards Human Respiratory Digital Twin using CFPD and PBPK Models. ANSYS Healthcare Industry Webcast Series. https://www.ansys.com/resource-library/webinar/towards-human-respiratory-digital-twin-using-cfpd-and-pbpk-models

[13]**Feng, Y.** (2020). Paving the way to the Next-Generation Virtual Lung Model for Exposure Risk Assessment, Oral Robert University, Tulsa, OK

[12] **Feng, Y.** (2020). Paving the way to the Next-Generation Virtual Lung Model for Personalized Pulmonary Healthcare. School of Industrial Engineering and Management at Oklahoma State University, Stillwater, OK.

[11] **Feng, Y.** (2019). Paving the Way to the Next-Generation Virtual Lung Model for Personalized Pulmonary Healthcare. 7th Beihang University Vision Forum for International Young Scholars, Beijing, China (Presented in Chinese)

[10] **Feng, Y.** (2019). The Next-Generation Virtual Human Model for Personalized Pulmonary Healthcare. Northeast University, Shenyang, Liaoning, China (Presented in Chinese)

[9] **Feng, Y.** (2019). Paving the way to the Next-Generation Virtual Lung Model for Personalized Pulmonary Healthcare. Kansas State University, Manhattan, KS, USA.

[8] **Feng, Y.** (2018), The next-generation virtual lung model with applications towards smoking related topics. Philip Morris International, Neuchatel, Switzerland

[7] **Feng, Y.** (2018). Paving the way to the Next-Generation Virtual Lung Model for Personalized Pulmonary Healthcare. Design of Medical Devices Conference China 2018, Beijing, China.

[6] **Feng, Y.** (2018). The CBBL Virtual Human System with Multiple Applications on Pulmonary Healthcare. Southeast University, Nanjing, Jiangsu, China (Presented in Chinese).

[5] **Feng, Y.** (2018). The CBBL Pulmonary Digital Twin and CFD-PBPK/TK Model. Zhejiang University, Hangzhou, Zhejiang, China (Presented in Chinese)

[4] **Feng, Y.** (2018). Applications of multiphase flow models on pulmonary healthcare research. Zhejiang Sci-Tech University, Hangzhou, Zhejiang, China (Presented in Chinese)

[3] **Feng, Y.** (2018). The CBBL Virtual Human System with Multiple Applications on Pulmonary Healthcare. DUT Star Ocean International Forum for Young Scholars, Dalian, Liaoning, China (Presented in Chinese)

[2] **Feng, Y.** (2016). Advanced Computational Fluid-Particle Dynamics (CF-PD) Models for Unconventional Inhaled Aerosols in Human Upper Airways (Plenary Lecture). Computational and Imagine methods for Lung Drug Delivery Workshop, COST Action MP1404, Prague, Czech Republic.

[1] **Feng, Y.** (2016). Advanced Computational Fluid-Particle Dynamics (CF-PD) Models for Inhalable Aerosols in Human Respiratory Systems. Shenyang Pharmaceutical University, China.

*Contributed Oral Presentations*

[35] Vannarath, S., Kim, P., Ford, M., Santhanakrishnan, A., **Feng, Y.**, Cai, C. (2022). Aerosol Dispersion of Submicrometer Particles in an Aircraft Cabin. AIHce EXP 2022, Nashville, TN, USA.

[34] Kolewe, E., Padhye, S., Woodward, I., Briddel, J., **Feng, Y.**, Fromen, C. (2022). CFPD Illuminates Developmental Anatomical Feature Influence on Aerosol Deposition Patterns in 6-year-old Upper Airway CT-Scan Models. AIChE Annual Meeting 2022, Pheonix, AZ, USA.

[33] Sperry, T., Zhao, J., **Feng, Y.,** Song, C., Shi, Z. (2022). Predict Transport and Deposition of Multicomponent E-cigarette Aerosols in a Subject-specific Airway Model with Different Nicotine Forms: An in silico Study. AAAR 2022, Raleigh, NC, USA.

[32] Chen, H., Harui, A., **Feng, Y.**, Roth, M., Zhu, Y. (2022). An Artificial Lung Model for Characterizing Deposition of E-cigarette Aerosols in Human Tracheobronchial Airways. AAAR 2022, Raleigh, NC, USA.

[31]Haghnegahdar A., Bharadwaj, R., **Feng, Y**. (2022). A CFD-DEM model for predicting the influence of nasal hair on the air-particle dynamics in nasal cavity. World Congress on Particle Technology (WCPT) 2022, Madrid, Spain

[30] Li, B.[*], **Feng, Y**[+]**.** (2022). In Silico Study to Enhance Delivery Efficiency of Nanoscale Nasal Spray Aerosols to the Olfactory Region Using External Magnetic Fields, Society for Computational Fluid Dynamics of the Nose & Airway (SCONA) 2022 (Virtual Meeting)

[29] Ford Versypt, A. N., Carpenter, S. L., Adkins II, T. L., Sperry, T. A. [*], **Feng, Y.** (2021). Kidney and Lung Activities for Biomedical Engineering Major at Grandparent University. BMES 2021, Orlando, FL, USA

[28] Ford Versypt, A. N., Carpenter, S. L., Adkins II, T. L., Sperry, T. A.[*], **Feng, Y.** (2021). Kidney and Lung Demonstrations to Introduce Engineering Concepts to Middle School Students and Their Grandparents. ASEE 2021 Annual Conference (Virtual Meeting)

[27] Zhao, J.[*], **Feng, Y.**[+], Haghnegahdar, A., Bharadwaj, R. (2021). Predict the Effect of Disease-Specific Airway Deformation Kinematics on Dry Powder Transport and Deposition in Whole Lung. AIChE Annual Meeting 2021, Boston, MA, USA

[26] Cai, C., **Feng, Y.** [†,+] (2021). Aid Pulmonary Disease Diagnosis and Treatment with CFD Modeling and Deep Learning: a New Perspective and Pilot Study. AAAR 2021 (Virtual Meeting)

[25] Bartlett, B.[*], **Feng, Y.,** Fromen, C. A., Ford Versypt, A. N. (2021), Computer Modeling of Aerosol Particle Transport through Lung Mucosa. AIChE Annual Meeting 2021.

[24] Zhao, J.[*], **Feng, Y.**[+] (2021). Prediction of disease-specific airway deformation kinematics using a new elastic truncated whole-lung model. ANSYS Simulation World 2021 (Virtual Meeting)

[23] Grady A., Rosencrans, T., Wu, H., **Feng, Y.** (2021). Computed Tomography Use in The Early Detection of Chronic Obstructive Pulmonary Disease. ATS 2021 International Conference, San Diego, CA.

[22] Zhao, J.*, **Feng, Y.**[+], Haghnegahdar, A.*, Saurabh, S., Rahul, B. (2020). Numerical Investigation of Particle Shape and Actuation Flow Rate Effects on Lactose Carrier Delivery Efficiency through a Dry Powder Inhaler (DPI) Using CFD-DEM. AIChE 2020 Annual Meeting, San Francisco, CA, USA

[21] Kolewe, E. L., **Feng, Y.**, Fromen, C. A. (2020). Lobe-Specific Aerosol Targeting in a 3D Printed Lung Model. AIChE 2020 Annual Meeting, San Francisco, CA, USA

[20] **Feng, Y.** (2020). Paving the way to the Next-Generation Virtual Lung Model for Personalized Pulmonary Healthcare. ANSYS Simulation World (Online Event)

[19] Hayati, H.*, **Feng, Y.**[+] (2020). A Precise Scale-up Method to Predict Particle Delivered Dose in A Human Respiratory System Using Rat Deposition Data: An In Silico Study. 2020 Design of Medical Devices Conference, Minneapolis, MN, USA

[18] Sessom, A. *, **Feng, Y.** [+] (2020). A Noninvasive Method for Early Diagnosis of Lower Airways Obstructions. AIChE Mid-America Regional Student Conference, Lincoln, Nebraska, USA

[17] Gaddam, M., **Feng, Y.**, Santhanakrishnan, A., Effect of Varying Inhalation Durations in Normal Breathing and HFOV Conditions. 72nd Annual Meeting of the APS Division of Fluid Dynamics, Seattle, WA, USA

[16] Zhao, J.*, **Feng, Y.**[+], Fromen, C., Hayati, H. (2019), The Impact of Glottis Abduction and Adduction on Particle Transport and Deposition in a Human Upper Airway Model. Third Aerosol Dosimetry Conference, Irvine, CA, USA

[15] Zhao, J.*, **Feng, Y.**[+], Bezerra, M., Wang, J., Sperry, T. (2019). Lung Dosimetry Assessments of Welding Fume and Gas Exposure using a Virtual Human Model with a Subject-Specific Respiratory System. AAAR 2019, Portland, OR, USA

[14] Sperry, T.*, **Feng, Y.**[+] (2019). Glottis Opening Effects on Inhaled Particle Deposition in Human Airways.AAAR 2019, Portland, OR, USA

[13] Kolewe, E. L., Fromen, C. A., **Feng, Y.** (2019). Realizing Lobe-Specific Targeting of Aerosols in a 3D Printed Lung Model. BMES 2019 Annual Meeting, Philadelphia, PA, USA

[12] **Feng, Y.**$^{+}$**,** Zhao, J*. (2019). Prediction of Lung Deformation and Induced Transient Airflow Patterns using Fluid-Structure Interaction (FSI) Modeling Techniques. American Thoracic Society (ATS) 2019 International Conference. Dallas, TX, USA.

[11] **Feng, Y.** (2018). Paving the way to the Next-Generation Virtual Lung Model for Personalized Pulmonary Healthcare. Design of Medical Devices Conference China 2018, Beijing, China.

[10] **Feng, Y.** (2018). Create your Digital Twin for Noninvasive Personalized Pulmonary Healthcare Planning, Coalition for Advancing Digital Research & Education, Stillwater, OK, USA

[9] Haghnegahdar, A.*, **Feng, Y.**$^{+}$ (2018). Predicting the Within-Host Dynamics of Influenza A Virus Infection in Upper Airway Epithelial Cells using a Multiscale CFPD-HCD model. The Oklahoma Center for Respiratory and Infectious Diseases 5th Annual Retreat, Stillwater, OK, USA

[8] Chen, X., Kleinstreuer, C., **Feng, Y.**, Lu, T., Sun, B., Zhong, W. (2018). Numerical Study of Flow Rate Effect on Hygroscopic Aerosol Transport and Deposition in a Basic Mouth-throat Airway with Realistic Wall Conditions. 10$^{th}$ International Aerosol Conference (IAC), St. Louis, IL, USA

[7] **Feng, Y.**$^{+}$**,** Chen, X., Yang, M. (2018). An In Silico Validation of a Lobe-Specific Targeted Pulmonary Drug Delivery Method. Design of Medical Devices Conference, University of Minnesota, Minneapolis, MN, USA

[6] **Feng. Y.**$^{+}$**,** Haghnegahdar, A.*, Chen, X. (2017). A Computational Multiphase Flow Model to Predict the Transport and Deposition of Inhaled Flu Virus-Laden Droplets in Human Respiratory Tracts for Early Infection Diagnosis. AIChE 2017 Annual Meeting, Minneapolis, MN, USA

[5] **Feng, Y.** (2017). A New Patient-Specific Pulmonary Drug Targeted Delivery Method to Treat Lung Cancer using E-Cigarette Technology. AIChE 2017 Annual Meeting, Minneapolis, MN, USA

[4] **Feng, Y.**$^{+}$**,** Wang, J., Haghnegahdar, A.*, (2017). Numerical Investigation of Occupational-related Metal Aerosol Transmission and Deposition Patterns in a Virtual Human Respiratory System. AAAR 2017, Raleigh, NC, USA

[3] **Feng, Y.** (2017). Implementation of Project-Based Learning Method on Teaching Numerical Modeling of Multiphase Flow with Biomedical Applications. 2017 ASEE Chemical Engineering Summer School, Raleigh, NC, USA

[2] **Feng, Y.** (2017). Computational Modeling Work in Targeted Pulmonary Drug Delivery. FY 2017 Generic Drug Research Public Workshop, Silver Spring, MD, USA

[1] Haghnegahdar, A.*, **Feng, Y.**$^{+}$ (2017). The translocation of nicotine from human lung to systemic regions due to E-cigarette aerosol inhalation: a numerical study, 5th International Conference on Computational and Mathematical Biomedical Engineering (CMBE), Pittsburgh, PA, USA.

*Contributed Poster Presentations (In Rank)*

[18] Bartlett, B., **Feng, Y.**, Fromen, C.A., Ford Versypt, A. N. (2019). Computer Modeling of Aerosol Diffusion through Lung Mucosa. AIChE Annual Meeting 2019, Orlando, FL, USA.

[17] Zhao, J.*, **Feng, Y.** $^{+}$ (2019). Understanding the Glottis Motion Effect on Aerosol Transport and Deposition in a Subject-Specific Human Upper Airway Configuration. AAAR 2019, Portland, OR, USA

[16] Kolewe, E. L., Fromen, C. A., **Feng, Y.** (2019). Realizing Lobe-Specific Targeting of Aerosols in a 3D Printed Lung Model. BMES 2019 Annual Meeting, Philadelphia, PA, USA

[15] Kolewe, E. L., **Feng, Y.**, Briddell, J., Fromen, C. A. (2019). Realizing Localized Aerosol Targeting: Right and Left Lung Deposition. 22nd International Society for Aerosols in Medicine (ISAM) Congress, Montreux, Switzerland.

[14] Hayati, H.*, **Feng, Y.**$^{+}$ (2019). Deposition Comparisons of IAV-Laden Particles in Rat and Human Respiratory Systems: An *In Silico* Study. Oklahoma Center for Respiratory and Infectious Diseases 6th Annual Research Symposium, Stillwater, OK, USA.

[13] Sperry, T.*, **Feng, Y.**$^{+}$ (2019). Glottis Opening Effects on Inhaled Particle Deposition in Human Airways. AIChE Mid-America Regional Student Conference, Rolla, Missouri, USA.

[12] Zhao, J.*, Liu, L., Fromen, C., **Feng, Y.**$^{+}$ (2019). Predicting Transport and Deposition of Inhaled Microparticles in an Elastic Lung Model. BMES/FDA Frontiers in Medical Devices Conferences, College Park, Maryland, USA.

[11] Haghnegahdar, A.*, **Feng, Y.**$^{+}$ (2019). Predicting the Influenza Virus Laden Droplets Transport, Deposition, and Associated Immune System Responses in Lung by a Multiscale CFPD-HCD Model. BMES/FDA Frontiers in Medical Devices Conferences, College Park, Maryland, USA

[10] Kozak, M.*, Fahlenkamp, H., **Feng, Y.**$^{+}$ (2018). Multiphase modeling of monocyte migration in a flow bioreactor system: an *in-silico* study. BMES Annual Meeting 2018, Atlanta, GA, USA

[9] Zhao, J., **Feng, Y.**$^{+}$, Mao, S., Lin, P. (2018). Transport Dynamics of Inhaled Chemotherapeutic Particles in a Human Respiratory System Using an LES Model. BMES Annual Meeting 2018, Atlanta, GA, USA

[8] Haghnegahdar, A., **Feng, Y.**$^{+}$ (2018). Deposition and Replication of Low-Strain Influenza A Virus in the Epithelium of a Human Upper Airway. BMES Annual Meeting 2018, Atlanta, GA, USA

[7] Haghnegahdar, A.*, Zhao, J.*, Kozak, M.*, Williamson, P., **Feng, Y.**$^{+}$ (2018) Analysis of Xenon Mass Transfer from Human Upper Airway to Systemic Region using a Hybrid CFD-PBPK Model. 10$^{th}$ International Aerosol Conference (IAC), St. Louis, IL, USA

[6] **Feng, Y.**$^{+}$**,** Chen, X., Zhao, J.* (2018). Effects of Airway Surface Roughness on Local Particle Depositions in Subject-Specific Tracheobronchial Trees. 10$^{th}$ International Aerosol Conference (IAC), St. Louis, IL, USA

[5] Kozak, M.*, Falenkamp, H., **Feng, Y.**$^{+}$(2017). Non-Newtonian fluid flow patterns in a customized parallel plate flow chamber: an i*n-silico* study using a Computational Fluid Dynamics model. 2017 ASEE Midwest Section Conference, Stillwater, OK, USA

[4] Haghnegahdar, A.*, **Feng, Y.**$^{+}$ (2017). Development of a multiscale CFPD-PBTK model for lung deposition and whole-body translocation of inhaled nicotine and acrolein in e-cigarette aerosols. 2017 ASEE Midwest Section Conference, Stillwater, OK, USA

[3] **Feng. Y.** $^{+}$**,** Wang. J., Chen, X. (2017). Noninvasive Diagnostics for the Early Detection of Lower Respiratory Diseases: an *In-Silico* Study. AIChE 2017 Annual Meeting, Minneapolis, MN, USA

[2] **Feng, Y.**$^{+}$**,** Chen, X., Xu, Z., Haghnegahdar, A.* (2017). Intersubject Variability in Pulmonary Drug Delivery Efficiency to Target Lung Tumors at Different Lobes: An *In-Silico* Study. BMES 2017 Annual Meeting, Phoenix, AZ, USA

[1] **Feng, Y.**$^{+}$, Haghnegahdar, A.* (2017). A New Pulmonary Drug Targeted Delivery Method for Lung Diseases Treatment: An *In-Silico* Study**.** The Oklahoma Center for Respiratory and Infectious Diseases 4th Annual Retreat, Stillwater, OK, USA

## PROFESSIONAL AFFILIATION AND ORGANIZATION MEMBERSHIPS

- **Chair:** Health Related Aerosol Working Group in American Association for Aerosol Research (AAAR)

- **Panel Reviewer:** NSF CBE Mammalian Cells and Fluid Dynamics, DoD CDMRP PRMRP 2020, NIH, NASA, etc.
- **Conference Organizer and Convener:** Society for Computational Fluid Dynamics of the Nose and Airway (SCONA) Annual Conference 2022
- **Early Career Editorial Board (ECEB):** Journal of Aerosol Science
- **Topical Advisory Panel Member:** MDPI Atmosphere
- **Editorial Board:** Korean Journal of Clinical Medicine
- **Editorial Advisory Board Member**: Heliyon
- **Lead Guest Editor:** MDPI Atmosphere Special Issue: "Special Issue on Mitigation Strategies for Airborne Transmission of SARS-CoV-2 Laden Aerosols"
- **Lead Guest Editor:** Computational and Mathematical Methods in Medicine *Special Issue:* Multiscale Computational Models for Respiratory Aerosol Dynamics with Medical Applications
- **Guest Editor:** Journal of Nanotechnology
- Member of Biomedical Engineering Society (BMES)
- Member of American Institute of Chemical Engineers (AIChE)

## TECHNICAL REVIEW ACTIVITIES

**(30+ Journals and 3 Conferences)**

- Physics of Fluids
- Physical Review Fluids
- PNAS
- The Lancet Regional Health Western Pacific,
- Journal of Aerosol Science
- Journal of Applied Physics
- Journal of Biomechanics
- Powder Technology
- Aerosol Science and Technology
- ASME Journal of Biomechanical Engineering
- European Journal of Pharmaceutical Sciences
- ASME Journal of Fluids Engineering
- Computer in Biology and Medicine
- Communication Medicine
- Building and Environment
- Aerosol and Air Quality Research
- Journal of Breath Research
- Biomechanics and Modeling in Mechanobiology
- Respiratory Physiology & Neurobiology
- Atmospheric Environment
- Energy Conversion and Management
- Energy
- Applied Thermal Engineering
- Fluids
- Particuology
- Journal of Mechanics Engineering and Automation
- Entropy
- European Journal of Mechanics
- Journal of Physics D: Applied Physics

- International Journal of Thermal Sciences
- International Journal of Physical Science
- Journal of Thermophysics and Heat Transfer
- Journal of Mechanical Engineering Science
- Journal of Nanoengineering and Nanosystems
- Abstract and Applied Analysis
- Applied Mathematical Modelling
- Nanoscale and Microscale Thermophysical Engineering
- Journal of Mechanical Engineering Research
- ASME IMECE 2013
- BMES 2017
- AAAR 2017 to 2021

## EDUCATIONAL ACTIVITIES

2019-2021 Development of "Lungevity" Session for OSU Grandparent University (GPU)

2021 Design Project Workshop for CEAT Summer Program

2021 Co-host of "Biomedical Engineers" Session for Oklahoma Technology Student Association conference

## HONORS and AWARDS

2021 Top 10 App Idea: "Pulmonary Obstruction Detector (POD)", OSU App Competition

2020 Pillar World Award, Innovation of the Year | Tackling COVID-19 with Innovative Ways

2019 "The Digital Elastic Whole-Lung Model", Winner of ANSYS Hall of Fame Competition 2019

2017 Best Presentation of Session "Computational Methods in Biological and Biomedical Systems II" AIChE Annual Meeting, Minneapolis, MN, USA

2017 Top 10 App Idea: "Personalized Pulmonary Surgery Planner", OSU App Competition

2016 ASME Early Career Technical Conference (ECTC) Presentation Award