

Two Open Ph.D. Positions on Lung Aerosol Dynamics Modeling

Responsibilities:

Computational Biofluidics and Biomechanics Laboratory at Oklahoma State University (CBBL@OKSU) is seeking two highly motivated Ph.D. candidates to join the group of Dr. Yu Feng in the School of Chemical Engineering starting Spring 2017. The overall goal of Dr. Yu Feng's group is to make significant impact to medical world and human life by providing well-posed solutions to realistic pulmonary health problems using numerical simulations based on interdisciplinary engineering fundamentals. The two openings are for graduate students interested in developing and applying advanced computational solutions to multiple biomedical problems involving inhaled aerosol transport in human respiratory systems and their translocation into systemic regions, using computational fluid-particle dynamics (CF-PD) and finite element analysis (FEA). Each Ph.D. candidate position will be offered a research assistantship. Some research projects may involve collaborations with the Oklahoma Center for Respiratory and Infectious Diseases (OCRID). Students with diverse backgrounds are encouraged to apply.

During his/her Ph.D. study, the successful candidate will:

- Focus on teamwork/collaboration, engineering fundamentals, creativity, and communication development (both written and oral).
- Establish novel and realistic computer simulation models that will provide quantitative data for assessment of inhaled aerosol transport, deposition, absorption, and translocation in human bodies.
- Interact with experimentalists and clinical doctors to validate numerical models and theoretical findings.
- Integrate scientific knowledge on pulmonary disease detection and treatment from multiple aspects in addition to pure computational research.
- Analyze numerical results and findings to generate new insights with relevance to, but not limited to, pulmonary health risk assessment, pulmonary drug delivery device optimization, non-invasive pulmonary disease diagnosis, etc.
- Contribute to the preparation of scientific publications and project documentations

Qualifications:

- Meet the admission requirements of the Graduate Program at Oklahoma State University
- B.S./M.S. in Chemical Engineering, Biomechanical Engineering, Mechanical Engineering, or other related engineering/science discipline
- Solid background in Partial Different Equations, Transport Phenomena, Aerosol Science, and Fluid Mechanics.
- Strong interest in Numerical Methods and Computational Fluid Dynamics (CFD)
- Strong motivation, great enthusiasm, and commitment for research excellence
- Good knowledge of FORTRAN, C, and/or C++ programming languages

- Good verbal and written English skills
- Good commercial CFD code skills for ANSYS CFD/Fluent and mesh generation tools are preferred
- Experience in Lattice-Boltzmann Method (LBM) is preferred
- Experience in AutoCAD/Solidworks is preferred
- Experience in turbulence and multiphase flow modeling is preferred
- Experience in fluid-structure interaction (FSI) modeling is preferred
- Experience in parallel programming and high performance computing is preferred.
- Knowledge of biology, human anatomy and physiology, as well as pharmaceutical industry is preferred.

Close Date:

Evaluation of applications will begin immediately and continue until the position is filled

How to Apply:

Interested candidates should submit to Dr. Yu Feng (yfeng4 [a] ncsu.edu) and the graduate program chegradprogram@okstate.edu with subject heading “(your name) – Ph.D.”, containing:

- Cover letter, describing your interest in and qualifications for this position;
- Curriculum vitae;
- (Unofficial) transcript;
- Representative publications (if any);
- Two or three letters of recommendation emailed separately by the writers

Dr. Yu Feng is happy to talk with the candidates to explore research topics to work on and potential fit to the group.

Context:

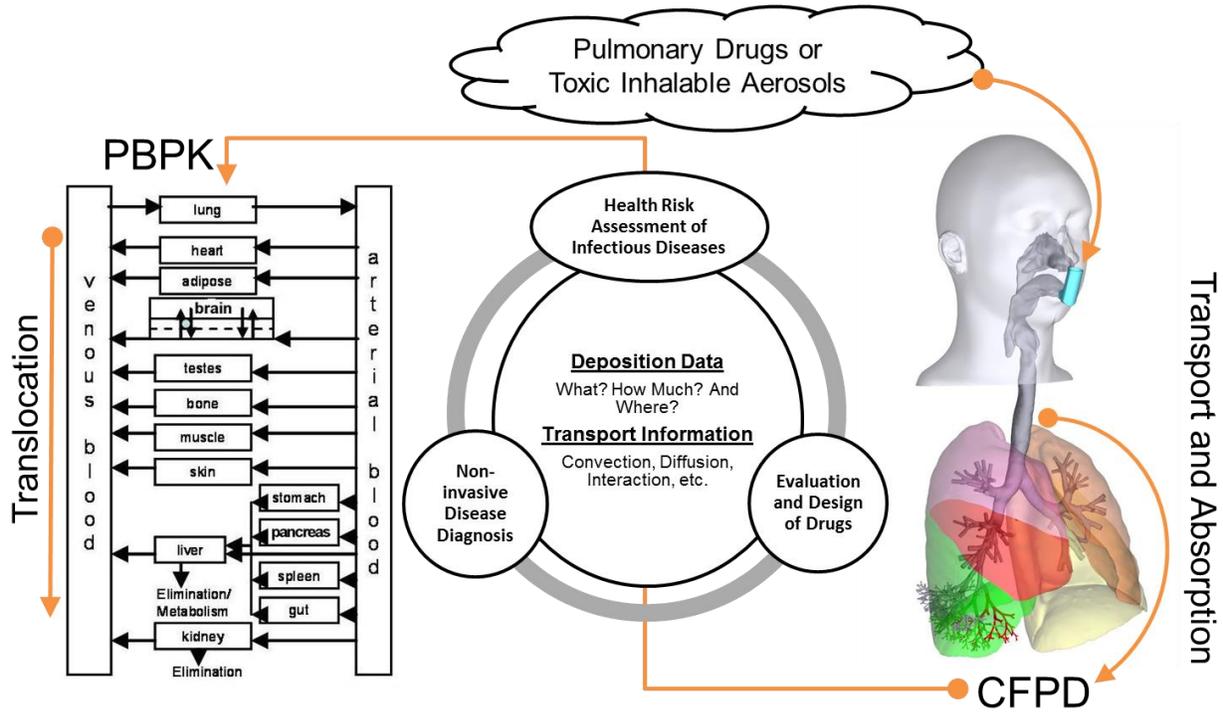


Fig. 1: Multi-scale Numerical Methods of Inhaled Aerosol Transport, Deposition, Translocation, and Clearance in Human Bodies

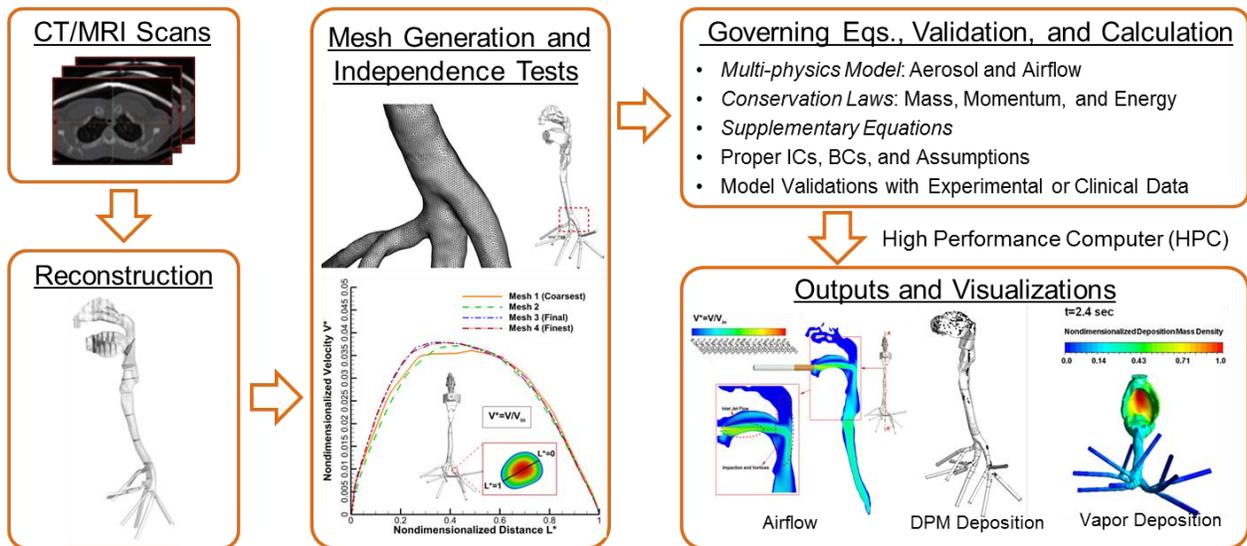


Fig. 2: Numerical Simulation Workflow using CF-PD Models

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Dr. Yu Feng's Short Bio:

Yu Feng will join the School of Chemical Engineering at Oklahoma State University as an Assistant Professor in August 2016. He will also join the Oklahoma Center for Respiratory and Infectious Diseases (OCRID) as a Center Investigator. Yu Feng is currently a Research Assistant Professor and Lab Manager of the Computational Multi-Physics Laboratory (CM-PL) at North Carolina State University. He has also held an affiliation with DoD Biotechnology HPC Software Applications Institute (BHSAI) as a Research Scientist II. He completed his B.S. in Engineering Mechanics in 2007 from the School of Aeronautics and Astronautics, Zhejiang University, Hangzhou, China. He then joined the Department of Mechanical and Aerospace Engineering at North Carolina State University, and obtained his M.S. and Ph.D. degrees in 2010 and 2013 respectively. His current research interests include advanced computational fluid-particle dynamics (CF-PD) modeling for the transport and deposition of inhalable drugs and toxicants in human respiratory systems, with applications of medical device improvements for effective and targeted drug deliveries, novel lung therapeutics, non-invasive disease diagnostic methodologies, and exposure health risk evaluations. The overall goal the research is to understand and consider more underlying physics and chemistry, in order to provide non-invasive, cost-effective, and accurate numerical tools with more simulating capabilities, complementing in vitro and in vivo studies for interdisciplinary engineering practice and academic research.

Outside of work, Yu Feng enjoys running (16 half marathons and 3 marathons in the past 3 years), hiking, playing basketball, and playing accordion.