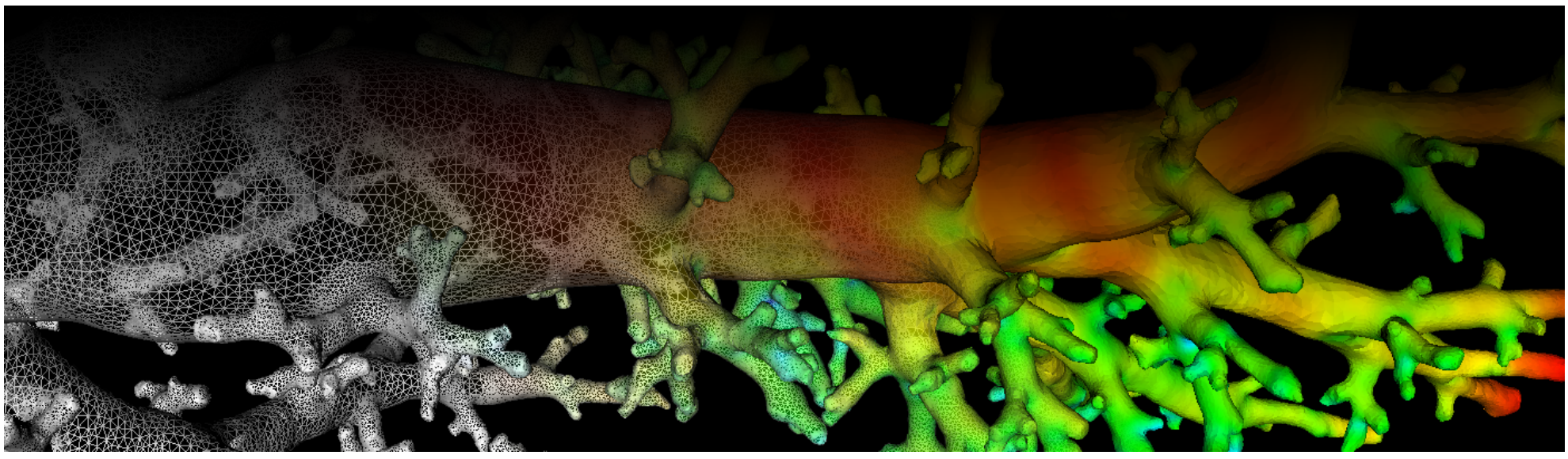
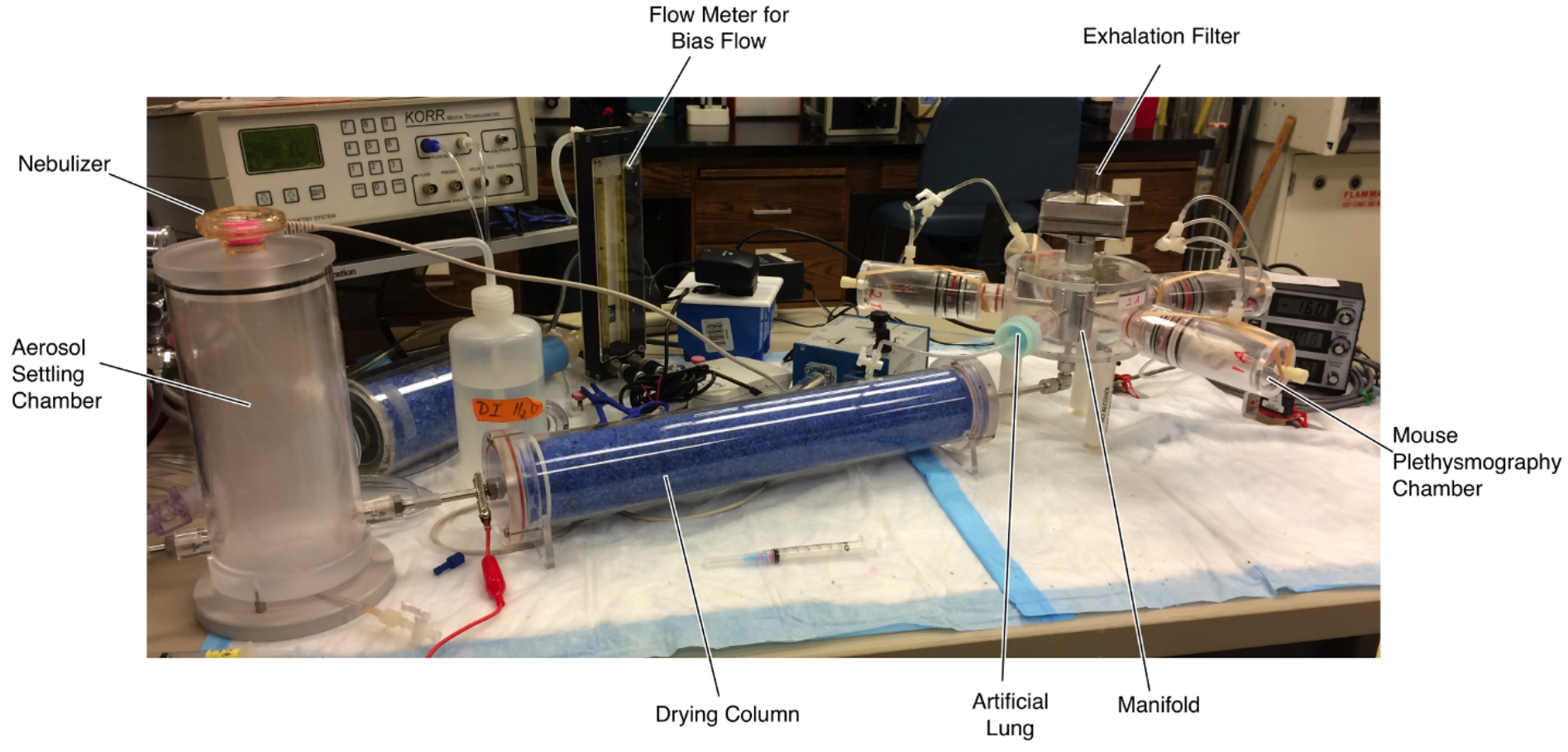
Lung Anatomy + Particle Deposition (lapd) Mouse Archive

for Modeling and Computational Toxicology



Animal Model

- Mice were studied in groups of 4, using 4 different strains (B6C3F1, BALB/c, CD-1, and C57BL/6) with balanced sexes.
- The animals were unsedated and restrained in place by a cervical holder that allowed free breathing while exposed to a central chamber containing fluorescent aerosol particles (see figure).
- Respiratory rate, tidal volumes and inspiratory/expiratory (I/E) ratios were measured and recorded in all animals throughout the exposure period using plethysmography.
- Aerosols of red fluorescent microspheres (ThermoFischer Scientific, Waltham, MA USA) were generated using an Aeroneb® Lab nebulizer that created droplets with volumetric mean volume diameters of 2.5 – 4.0 μm.
- The wet aerosol was allowed to settle and then pass through a drying column before entering a manifold that distributed the dry aerosol to the 4 mice.
- A Mini-Vent, operating as an artificial lung at a known minute ventilation, was attached to the fifth port. A filter collecting the microspheres was used later to estimate microsphere exposure dose to the mice.
- Separate experiments were conducted with aerosol microspheres with diameters of 0.5, 1.0, and 2.0 μm.
- After each exposure, the mice were killed, their lungs excised and filled to TLC with OCT (optimal cutting tissue media).
- The lungs, trachea, and heart are removed en bloc and placed in a silicone mold to freeze. Prior to slicing, the sample is embedded in lab-made "black" OCT.



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