Workshop: Acinar micromechanics in health and disease

June 19 to June 20
Hannover Medical School,
Institute of Functional and Applied Anatomy
Building I3, Floor H0, Room 2020

June 19, 2019

Session 1: The functional design of the lung in health and disease

10:00 – 10:40 Matthias Ochs (Berlin, DE): The functional design of the human lung – what do we know about acinar microarchitecture?
10:40 – 11:20 Elena Lopez-Rodriguez (Berlin, DE): Lung surfactant metabolism: early in life and early in diseases.
11:20 – 12:00 Rachel Zemans (Michigan, USA): ARDS and regeneration: what we learned from imaging studies.

Lunch break

Session 2: Quantitative and functional imaging techniques in animal studies

13:00 – 13:40 Philip Koniezke, Willi Wagner, Zhu Lin (Heidelberg, DE): The use of micro computed tomography (µCT) in animal models of lung diseases.
13:40 – 14:20 Carrie Perlman (Hoboken, USA): Ex vivo imaging to investigate alveolar micromechanics in health and disease: roles of edema, surfactant and mucins.
14:20 – 15:00 Wolfgang Kübler (Berlin, DE): Functional imaging of alveolar micromechanics in models of acute lung injury.
15:00 – 15:40 Roman Grothausmann (Hannover, DE): Using image analyses to study alveolar shape

Coffee break

Session 3: Quantitative and functional imaging techniques in humans

16:00 – 16:40 Hoen-oh Shin (Hannover, DE): Morphological and functional CT analysis of regional change in Idiopathic Pulmonary Fibrosis (IPF)
16:40 – 17:20 John McDonough (Yale, USA): Correlative imaging of lung explants to investigate the spatial spreading of human IPF within the lung.

June 20, 2019

Session 4: Computational modelling

8:30 – 9:10 Bradford Smith (Denver, USA): Computational modelling of structure- function relationships in ARDS and VILI

9:10 – 9:50 Jason HT Bates (Burlington, USA): The concept of percolation – a model of lung mechanical degradation in lung fibrosis

09:50 – 10:30 Bela Suki (Boston, USA): The role of collagen waviness in alveolar inflation stability

Coffee break

Session 5: How imaging can be used to inform computational modelling?

11:00 – 11:40 Christian Mühlfeld (Hannover, DE): Design-based stereology to quantify lung structures in animal models of lung diseases

11:40 – 12:20 Lars Knudsen (Hannover, DE): Animal models of lung injury and fibrosis – structure-function relationship.

12:20 – 13:00 Bradford Smith (Denver, USA) and Lars Knudsen (Hannover, DE): Potential computational modelling concepts for ARDS/ VILI and pulmonary fibrosis

13:00 – Discussion: e.g. knowledge gaps and how to address them; combining functional and quantitative imaging with lung mechanics using computational modelling.