Virtual academy of lung physiology and structure
15-17 May 2023

Pre-recorded sessions

**Session 1: Respiratory physiology: the basics**

Respiratory mechanics: How the lung is supported and moved - A. Aliverti
How oxygen is transported - S. Bayat
How CO2 is transported - S. Bayat
Pulmonary blood circulation – F. Lador
How breathing is controlled – J. L Feldman
Exercise - P. Laveneziana
Mechanisms of hypoxemia - P. Palange

**Session 2: Respiratory diseases from a physiologic perspective**

Asthma - M. Bonini
COPD – T. Conlon
Pulmonary embolism - M. Delcroix
ARDS - F. Laghi
Obesity-hypoventilation syndrome - J. Pépin, S. Schiza
Neuromuscular diseases - C. Jolley
Interstitial lung diseases - T. Gille

**Session 3: The expanding repertoire of resident epithelial cells – diversification of functions**

Bronchial epithelium / conducting zone - C. Staab-Weijnit, H. I. Heijink
Mechanisms of epithelial aging and senescence, key developmental pathways and their reactivation in disease - M. Lehmann, L. Donnelly
Lung fibroblast function and plasticity – S. Rolandsson Enes
Main components and functions of the extracellular matrix, ECM turnover - J. Burgess, C. Taggart
Endothelial cells - H. Bogaard, J. Schupp
Smooth muscle cells - R. Gosens
Session 4: Lung immunology
Development and education of the immune system – S. Knapp
Sensing and (not) responding to the inhaled environment - P. Hiemstra
Innate immunity and innate memory: not just short -term protection of our lungs – H. Heine
Beyond the classical Th1-Th2 paradigm – F. Polverino
The role of the immune response in tissue repair – B. N. Melgert
The response to bacterial and viral infections – A. Singanayagam
Chronic inflammation and the lung microbiome – N. Ubags

Session 5: Molecular regulation of pulmonary homeostasis and respiratory diseases
The many ways a cell can die - K. Bracke
Mitochondria; the powerhouses of our cells govern more than energy production - S. Cloonan
The involvement of dysregulated proteostasis in lung pathology and ageing - S. Meiners
Oxidative stress: the unavoidable consequence of breathing - N. Reynaert
Monday, 15 May 2023

**Opening session: Lung development**
Chair: P. Laveneziana, T. Gille

- **09:00–09:10** Introduction
- **09:10–09:30** Lung development – S. Bellusci
- **09:30-09:40** Q&A
- **09:40-10:00** How breathing is controlled – J. L Feldman
- **10:00-10:10** Q&A

**Session 2: Respiratory physiology - The basics**
Chair: P. Laveneziana, T. Gille

- **10:10–10:30** Pulmonary function tests – K. Sylvester
- **10:30–10:40** Q&A
- **10:40–11:00** Obstructive Lung Diseases - C. Jolley
- **11:00-11:10** Q&A

**Break**

- **11:10–11:25**
- **11:25–11:45** Restrictive Lung Diseases - T. Gille
- **11:45–11:55** Q&A
- **11:55–12:15** Vascular Diseases - F. Lador
- **12:15–12:25** Q&A

**Break**

- **12:25–12:35**
- **12:35–13:30** Case based discussion

**Lunch break**

**Session 3: Respiratory diseases from a physiologic perspective**
Chair: P. Laveneziana, T. Gille

- **14:30–14:50** Respiratory failure - F. Laghi
- **14:50–15:00** Q&A
- **15:00–15:20** Exercise limitation - P. Laveneziana
- **15:20–15:30** Q&A
15:30–15:45 Break

15:45–16:05 Environmental diseases - I. Annesi Maesano
16:05–16:15 Q&A
16:15–16:35 Sleep disordered breathing - S. Schiza
16:35–16:45 Q&A

16:45–17:00 Break

17:00–18:30 Case-based discussion

---

**Tuesday, 16 May 2023**

Session 1: Lung Tissue Structure and Cell Biology: The expanding repertoire of resident epithelial cells – diversification of functions
Chair: A. Goodwin

09:00–09:20 Bronchial epithelium / conducting zone - C. Staab-Weijnnitz, H. Irene Heijink
09:20–09:30 Q&A
09:30–09:50 Alveolar epithelium / respiratory zone – A. Pardo-Saganta
09:50–10:00 Q&A
10:00–10:20 Mechanisms of epithelial aging and senescence, key developmental pathways and their reactivation in disease - M. Lehmann, L. Donnelly
10:20–10:30 Q&A

10:30–11:00 Break

11:00–12:30 Interactive discussion

12:30-13:00 Lunch break
Session 2: Mesenchymal cells and ECM as powerful modulators of the lung scaffold
Chair: M. Nizamoglu
13:50–14:00  Q&A
14:00–14:20  Main components and functions of the extracellular matrix, ECM turnover - J. Burgess
14:20–14:30  Q&A
14:30–14:45  Break
14:45–15:05  Smooth muscle cells - R. Gosens
15:05–15:15  Q&A
15:35–15:45  Q&A
15:45–16:00  Break
16:00–17:30  Interactive discussion

Wednesday, 17 May 2023

Session 1: Lung immunology
Chair: L. Regard
09:00–09:20  Sensing and (not) responding to the inhaled environment - P. Hiemstra
09:20–09:30  Q&A
09:30–09:50  Innate immunity and innate memory: not just short-term protection of our lungs – H. Heine
09:50–10:00  Q&A
10:00–10:15  Break
10:15–10:35  Adaptive immunity – F. Polverino
10:35–10:45  Q&A
The interplay between acute infections and chronic inflammation and effects on the lung microbiome – N. Ubags

Q&A

Break

Interactive discussion

Lunch break

Session 2: Molecular regulation of pulmonary homeostasis and respiratory diseases
Chair: E. Lopez Rodriguez

Mitochondria – the powerhouses of our cells govern more than energy production - S. Cloonan

Q&A

The involvement of dysregulated proteostasis in lung pathology and ageing - S. Meiners

Q&A

Break

Closing lecture
Chair: R. Jurkowska

Lung function trajectories/exposome/aging – A. Agusti Garcia-Navarro

Q&A