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

Pre-recorded sessions

Session 1: Respiratory physiology: the basics

Respiratory mechanics: How the lung is supported and moved - A. Aliverti

How oxygen is transported and used? - S. Bayat

How CO2 is transported and used? - S. Bayat

Pulmonary blood circulation – F. Lador

How breathing is controlled

Exercise - P. Laveneziana

Mechanisms of hypoxemia - P. Palange

Session 2: Respiratory diseases from a physiologic perspective

Asthma - M. Bonini

COPD -

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-Weijnitz

Alveolar epithelium / respiratory zone - J. H. Lee

Mechanisms of epithelial aging and senescence, key developmental pathways and their reactivation in disease - M. Lehmann, L. Donnelly

Lung fibroblast function and plasticity -

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 -

Sensing and (not) responding to the inhaled environment - P. Hiemstra

Innate immunity and innate memory: not just short -term protection of our lungs -

Beyond the classical Th1-Th2 paradigm -

The role of the immune response in tissue repair -

The response to bacterial and viral infections -

Chronic inflammation and the lung microbiome -

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

Mechanosensing – the molecular intersection to (patho)physiology -

Monday, 15 May 2023

	Opening session: Lung development
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 –
10:00-10:10	Q&A
	Session 2: Respiratory physiology - The basics
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
11:10–11:20	Break
11:20–11:40	Restrictive Lung Diseases - T. Gille
11:40–11:50	Q&A
11:50–12:10	Vascular Diseases - F. Lador
12:10–12:20	Q&A
12:20–13:30	Case based discussion
13:30–14:30	**Lunch break**
	Session 3: Respiratory diseases from a physiologic perspective
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 Maesan
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
09:00–09:20	Bronchial epithelium / conducting zone - C. Staab-Weijnitz
09:20–09:30	Q&A
09:30–09:50	Alveolar epithelium / respiratory zone -
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
12:30-13:30	**Lunch break**
	Session 2: Mesenchymal cells and ECM as powerful modulators of the lung scaffold
13:30–13:50	Lung fibroblast function and plasticity - E. El Agha
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
15:15–15:35	Endothelial cells - H. Bogaard, J. Schupp
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
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 -
09:50–10:00	Q&A
10:00–10:15	Break
10:15–10:35	Adaptive immunity -
10:35–10:45	Q&A
10:45–11:05	The interplay between acute infections and chronic inflammation and effects on the lung microbiome -
11:05–11:15	Q&A
11:15–11:30	Break
11:30–13:00	Interactive discussion
13:00-14:00	**Lunch break**
	Session 2: Molecular regulation of pulmonary homeostasis and respiratory diseases
14:00–14:20	Mitochondria –the powerhouses of our cells govern more than energy production - S. Cloonan
14:20–14:30	Q&A
14:30–14:50	The involvement of dysregulated proteostasis in lung pathology and ageing - S. Meiners
14:50–15:00	Q&A
15:00–15:20	Mechanosensing – the molecular intersection to (patho)physiology -
15:20–15:30	Q&A
15:30–16:00	Break
16:00–17:30	Interactive discussion
17:30–17:45	Break
	Closing lecture

17:45–18:05	Lung function trajectories/exposome/aging -
18:05–18:15	Q&A