

Department of Respiratory Diseases and Allergy  
Aarhus University Hospital  
Aarhus University  
Aarhus  
Denmark



**TABLE OF CONTENTS**

Table of contents

Highlights 2021.....3

Research areas.....4

Research staff in 2021.....5

Research projects in 2021.....9

Papers.....15

Abstracts.....20

PhD thesis.....21

Funding.....22

Research strategy 2022-2025.....23

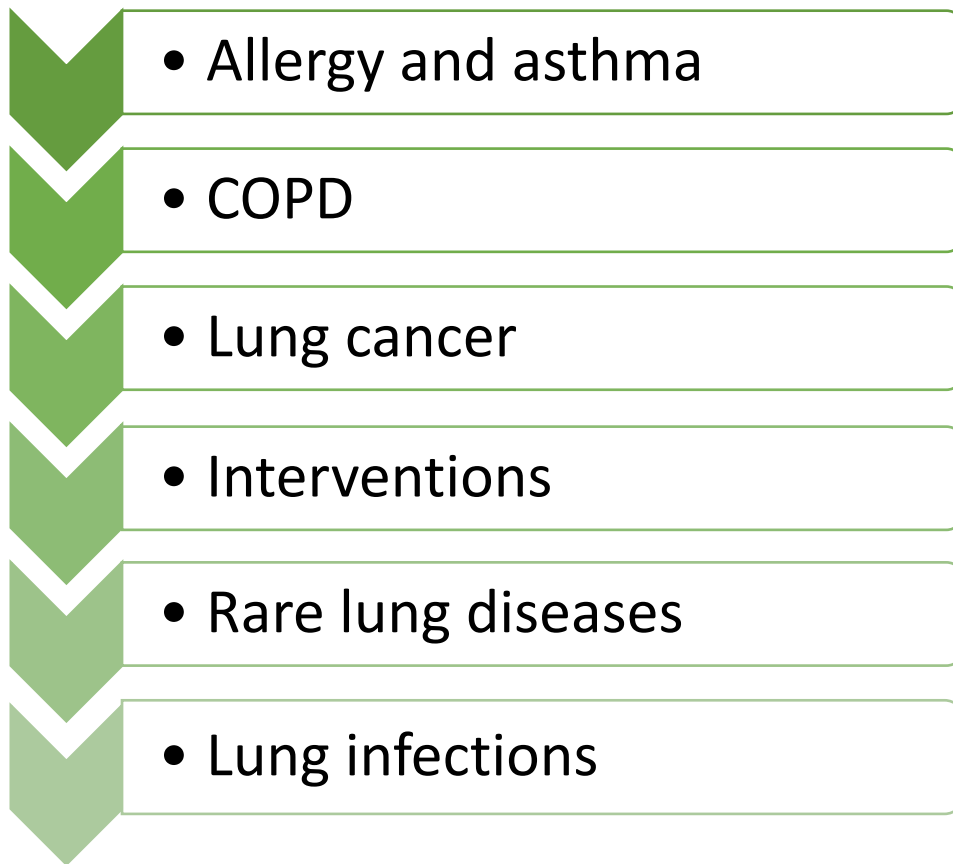
Contact information.....12

## HIGHLIGHTS 2021

- ✓ More than 60 papers published
- ✓ First nurse PhD thesis
- ✓ Research task force council
- ✓ ILIT
- ✓ Seven PhD students
- ✓ Four Pre-PhD students
- ✓ Professor appointment
- ✓ Five associate professors

## RESEARCH AREAS

At the Department of Respiratory Diseases and Allergy, our research is focused on six areas.

- 
- Allergy and asthma
  - COPD
  - Lung cancer
  - Interventions
  - Rare lung diseases
  - Lung infections

**RESEARCH STAFF IN 2021**



Elisabeth Bendstrup, professor, PhD



Hans Jürgen Hoffmann, professor MSO



Venerino Poletti, MD, PhD, affiliate professor

## RESEARCH STAFF IN 2021



Johannes Schmid  
MD, PhD, associate professor



Tina Skjold 3  
MD, PhD, associate professor



Anne Sophie Bjerrum  
MD, PhD, associate professor



Niels Lyhne Christensen  
MD, PhD, associate professor



Torben Riis Rasmussen  
MD, PhD, associate professor

## RESEARCH STAFF IN 2021



Bjarke Hviid-Vyff, MD, PhD student



Anne Poder Pedersen, Nurse, PhD student



Jose Cerdan de Las Hera  
Physiotherapist, PhD student



Anja Gouliaev, MD, PhD student



Janne Møller, MD, PhD student



Søren Sperling Haugen, MD, PhD student



Sissel Kronborg-White, MD, PhD student



Thomas Skovhus Prior, MD, PhD, post doc



Birgit Refsgaard Iversen, MScN, MLP, PhD



Andreas Fløe, MD, PhD



Søren Helbo, MD, PhD



**RESEARCH STAFF IN 2021**



Pernille Caspersen, Study nurse & coordinator



Dorte Kristensen, Study nurse



Lis Ottesen, Study nurse



Lena Johnsen, Study nurse



Mette Toft, professor secretary



Anne-Marie Toft, Laboratory technician



Hans Pedersen, Laboratory technician

## RESEARCH PROJECTS IN 2021

The Department of Respiratory Diseases and Allergy, and the research unit participates in investigator-initiated studies initiated from employees from our own department, investigator-initiated studies from national and international centers and sponsor-initiated studies.

### • Allergy and asthma

#### **Own investigator-initiated studies**

ILIT.NU: Effect of Intralymphatic immunotherapy in grass pollen allergic subjects

A motivation-enhancing intervention to retain participants in the ILIT.NU trial after treatment with allergen immunotherapy

#### **National investigator-initiated studies**

OPTIMAL study. Titration of treatment with biologics in severe asthma

#### **International investigator-initiated studies**

ISAR GLITTER: Characterization of biologic initiation in a real-world severe asthma cohort with high steroid exposure

ISAR GLITTER II: Comparative Effectiveness of Initiating Biologics in Patients with Severe Asthma and High Steroid Exposure

Biologic utilization patterns, clinical outcomes and healthcare resource utilization in ISAR -The CLEAR Study Results

#### **Sponsor-initiated studies**

CHINOOK, AstraZeneca

VESTIGE, Sanofi

WAYPOINT, AstraZeneca



## • COPD

### **Own investigator-initiated studies**

Patients experience with endobronchial valves (EBV): A qualitative investigation before and after EBV treatment

The lung microbioma in emphysema patients with chronic obstructive lung disease treated with endobronchial valves: complications and prognosis

COPD patients' experiences of affiliation with the outgoing lung team: A qualitative study

### **National investigator-initiated studies**

The CODEX-P Trial: [COPD EXacerbation and Pulmonary hypertension Trial]

COPERNICOS COPD: Eosinophil-guided Reduction of inhaled CORTicoSteroids

### **Sponsor-initiated studies**

COURSE, AstraZeneca

SPARTA, Grifols

SPARTA OLE, Grifols

ASTRAEUS, Mereo



## • Lung cancer

### **Own investigator-initiated studies**

*Quality Assessment of Lung Cancer MDT Conferences in Denmark*

*Long-term survival of Danish Lung Cancer Patients*

- Validation of the Danish Lung Cancer Registry
- Factors relating to 5-year mortality among Danish patients with NSCLC
- Causes of death of Danish and Norwegian patients with NSCLC
- The effect of depression on long term NSCLC survival

*A descriptive and comparative study of the Nordic Lung Cancer Registries*

### **National investigator-initiated studies**

**SUPE-R:** *SURveillance with PET/CT and liquid biopsies of stage I-III lung cancer patients after completion of definitive therapy; a Randomized controlled trial.*

**NEBULA:** *Electromagnetic Navigation Bronchoscopy versus Combined Electromagnetic Navigation Bronchoscopy and Radial Endobronchial Ultrasound for Diagnosis of Peripheral Lung Lesions – A Randomized Clinical Trial.*

Routes to diagnosis and the association with the prognosis in patients with cancer – A nationwide register-based cohort study in Denmark.

### **International investigator-initiated studies**

Long-term survival and treatment of lung cancer in Europe - an international registry study (LUCAEUROPE).



## • Interventions

### **Own investigator-initiated studies**

Survey regarding treatment of spontaneous pneumothorax in Denmark.

Cryobiopsies in interstitial lung diseases: A comparison study of conventional fluoroscopic guidance and SuperDimension navigation system  
Comparison of ultrasound modalities to assess diaphragm function.

Diaphragm dysfunction following thoracic surgery.

Focused lung ultrasound to predict respiratory failure in patients with symptoms of COVID-19. A multicentre prospective cohort study.

### **National investigator-initiated studies**

NEBULA: Electromagnetic Navigation Bronchoscopy versus Combined Electromagnetic Navigation Bronchoscopy and Radial Endobronchial Ultrasound for Diagnosis of Peripheral Lung Lesions – A Randomized Clinical Trial.

Point-of-care focused lung ultrasound in emergency medicine: a scoping review

### **International investigator-initiated studies**

Uniform Training in Point-of-Care Focused Lung Ultrasound for Pneumonia — an International Delphi Consensus Study

### **Sponsor-initiated studies**

A prospective, multicenter, post market study to collect data for software recognizing the anatomical structures as well as abnormalities in the lung during a bronchoscopy.



## • Rare lung diseases

### **Own investigator-initiated studies**

Interobserver agreement of radiological Scadding staging on thorax x-ray of sarcoidosis patients

D-vitamin and alveolar macrophages in Idiopathic Pulmonary Fibrosis

Qualitative study in patients with progressive fibrosing interstitial lung disease (PF-ILD) requiring opioid therapy for breathlessness

Associations between fibroblast activation protein and disease severity, progression and survival in IPF

Automated oxygen titration with O2matic during walking in patients with F-ILD: A randomized study

Correlation between B-cell follicles in lung cryobiopsies and mediastinal lymph node enlargement on HRCT

### **National investigator-initiated studies**

Non-infectious manifestations in Danish CVOD patients

Real-life experience of antifibrotic therapy with nintedanib in patients with progressive fibrosing interstitial lung disease (PF-ILD)

### **International investigator-initiated studies**

Anti-inflammatory Treatment in Unclassifiable Interstitial Lung Disease: ATTILA-Study

Comorbidities in unclassifiable interstitial lung disease: Data from the ATTILA cohort

Clusters of comorbidity in patients with chronic hypersensitivity pneumonitis

Implementation of complete blood count in predicting disease progression of patients with Hypersensitivity Pneumonitis

### **Sponsor-initiated studies**

Zephyrus, Fibrogen

Starscape, Roche

BI 1305, Boehringer Ingelheim

CMK389, Novartis



## • Lung infections

### **Own investigator-initiated studies**

Diagnosis and management of lung abscess: A retrospective cohort study

LOTUS – Long-term Pulmonary Outcomes After Infection With SARS-CoV-2

Diaphragm function in patients with myositis following SARS-CoV-2.

Diagnosis and treatment of latent tuberculosis in new refugees

Prevalence of latent and active tuberculosis and health factors associated with latent tuberculosis infection among socially marginalized people in urban areas of a low incidence country

### **National investigator-initiated studies**

Intrapleural fibrinolysis and DNase versus VATS for the treatment of pleural empyema: a randomized, controlled trial.

Personalized tuberculosis risk profile in a prospective cohort study in Denmark (miRNA til prædiktion af udvikling af TB)

### **Sponsor-initiated studies**

Encore, INSMED

Arise, INSMED

Aspen, INSMED

In 2021, we have published 61 papers in international and national peer-reviewed journals.

### Allergy and asthma (13 publications)

Paoletti G, DiBona D, Chu DK, Firinu D, Heffler E, Agache I, Jutel M, Klimek L, Pfaar O, Mösges R, Dunn Galvin A, Genuneit J, **Hoffmann HJ**, Canonica GW. Allergen immunotherapy: the growing role of observational and randomised trial "Real-World Evidence". *Allergy*. 2021 Feb 14. doi: 10.1111/all.14773.

Santos AF, Alpan O, **Hoffmann HJ**. Basophil activation test: mechanisms and considerations for use in clinical trials and clinical practice. *Allergy*. 2021 Jan 21. doi: 10.1111/all.14747.

Prætorius K, Henriksen DP, **Schmid JM**, Printzlau P, Pedersen L, Madsen H, Andersson EA, Madsen LK, Chawes BL. Indirect comparison of efficacy of dupilumab versus mepolizumab and omalizumab for severe type 2 asthma. *ERJ Open Res*. 2021

Zbären N, Brigger D, Bachmann D, Helbling A, Jörg L, Horn MP, **Schmid JM**, **Hoffmann HJ**, Kinet JP, Kaufmann T, Eggel A. A novel functional mast cell assay for the detection of allergies. *J Allergy Clin Immunol*. 2021.

Lamb D, De Sousa D, Quast K, Fundel-Clemens K, Erjefält JS, Sandén C, **Hoffmann HJ**, Kästle M, Schmid R, Menden K, Delic D. ROR $\gamma$ t inhibitors block both IL-17 and IL-22 conferring a potential advantage over anti-IL-17 alone to treat severe asthma. *Respir Res*. 2021.

Bousquet J, **Hoffmann HJ**. et al. Management of anaphylaxis due to COVID-19 vaccines in the elderly. *Allergy*. 2021.

Moheit L, Schmid JD, **Schmid JM**, Eser M, Marburg S. Acoustics Apps: Interactive simulations for digital teaching and learning of acoustics. *J Acoust Soc Am*. 2021.

Harrison TW, Chanez P, Menzella F, Canonica GW, Louis R, Cosio BG, Lugogo NL, Mohan A, Burden A, McDermott L, Garcia Gil E, Zangrilli JG; ANDHI study investigators. Onset of effect and impact on health-related quality of life, exacerbation rate, lung function, and nasal polyposis symptoms for patients with severe eosinophilic asthma treated with benralizumab (ANDHI): a randomised, controlled, phase 3b trial. *Lancet Respir Med*. 2021.

**Bjerrum AS**, **Skjold T**, **Schmid JM**. Oral corticosteroid sparing effects of anti-IL5/ anti-IL5 receptor treatment after 2 years of treatment. *Respir Med*. 2021; 176: 106260.

**Skaarup SH**, Graumann O, **Schmid JM**, **Bjerrum AS**, **Skjold T**, **Hoffmann HJ**. The number of successful injections associates with improved clinical effect in intralymphatic immunotherapy. *Allergy*. 2021.

**Skaarup SH**, **Schmid JM**, **Skjold T**, Graumann O, **Hoffmann HJ**. Intralymphatic immunotherapy improves grass pollen allergic rhinoconjunctivitis: A 3-year randomized placebo-controlled trial. *J Allergy Clin Immunol*. 2021.



**Schmid JM**, Würtzen PA, Siddhuraj P, Jogdand P, Petersen CG, Dahl R, Erjefält JS, **Hoffmann HJ**. Basophil sensitivity reflects long-term clinical outcome of subcutaneous immunotherapy in grass pollen-allergic patients. *Allergy*. 2021.

Hansen S, Hilberg O, Ulrik CS, Bodtger U, Rasmussen LD, Assing K, Wimmer-Aune AB, Rasmussen K, Bjerring N, Christiansen A, **Schmid JM**, Krogh NS, Porsbjerg C. The Danish severe asthma register: an electronic platform for severe asthma management and research. *European Clinical Respiratory Journal*. 2021; 8, 1, 13 s., 1842117.

### **COPD (6 publications)**

**Sritharan SS**, Østergaard EB, Callesen J, Elkjaer M, Sand L, Hilberg O, **Skaarup SH**, Løkke A. Barriers toward Physical Activity in COPD: A Quantitative Cross-Sectional, Questionnaire-Based Study. *COPD*. 2021 May 10:1-16.

Laursen KR, Bønløkke JH, **Bendstrup E** et al. An RCT of acute health effects in COPD-patients after passive vape exposure from e-cigarettes. *European Clinical Respiratory Journal* 2021.

Larsen CH, **Bendstrup E**, Neergaard MA. Screening Tools for Depression and Anxiety in Patients with Chronic Obstructive Pulmonary Disease – A Systematic Review. *COPD: Journal of Chronic Obstructive Pulmonary Disease*. doi.org/10.1080/15412555.2021.1972091

**Iversen BR**, Løkke A, Bregnballe V, Rodkjær LØ. Does affiliation to a cross-sectorial lung team impact well-being, health-related quality of life, symptoms of anxiety and depression and patient involvement in patients with COPD? A randomised controlled trial. *Scand. J. Caring Sci*. 2021; 11: 1-12.

**Iversen BR**, Rodkjaer L, Bregnballe V, Løkke A. Clinical Outcome of a Cross-Sectorial Lung Team Treating Patients with COPD at High Risk of Exacerbation: A Randomized Controlled Trial. *COPD: Journal of Chronic Obstructive Pulmonary Disease*. 2021;18(2):201-9. doi.org/10.1080/15412555.2021.1898577

**Iversen BR**, Rodkjær LØ, Bregnballe V, Løkke, A. The impact on severe exacerbations of establishing a cross-sectorial lung team for patients with COPD at high risk of exacerbating: a pilot study. *European Clinical Respiratory Journal*. 2021;8(1):1882029. doi.org/10.1080/20018525.2021.1882029

### **Lung cancer (11 publications)**

Bredtoft EN, **Madsen HH**, **Rasmussen TR**. Stage I lung cancer patients with or without symptoms – are the patients different and should we treat them differently? *Acta Oncologica* 2021.

Danckert B, Falborg AZ, **Christensen NL**, Frederiksen H, Lyratzopoulos G, McPhail S, Ryg J, Vedsted P, Thomsen LA, Jensen H. Routes to diagnosis and the association with the prognosis in patients with cancer – A nationwide register-based cohort study in Denmark. *Cancer Epidemiology* 2021

**Gouliaev A**, Risikesan J, **Christensen NL**, **Rasmussen TR**, Hilberg O, Ibsen R, Løkke A. Direct and indirect economic burden of lung cancer in Denmark a nationwide study. *Eur Clin Respir J*. 2021

**Gouliaev A**, Hilberg O, **Christensen NL**, **Rasmussen TR**, Ibsen R, Løkke A. Comorbidity among Danish lung cancer patients before and after initial cancer diagnosis. *Eur Clin Respir J*. 2020 Dec 20;8(1):1861579.

Therkildsen DS, Christensen J, Andersen O, Thomsen LA, **Rasmussen TR**, **Christensen NL**. Outcomes and characteristics of Danish patients undergoing a lung cancer patient pathway without getting a lung cancer diagnosis. A retrospective cohort study. *European Clinical Respiratory Journal*. 2021.

Fjællegaard K, Petersen JK, Armbruster K, Jensen HK, **Skaarup SH**, Laursen CB, Clementsen PF, Bødtger U. Malignant pleural effusion. *Ugeskr Laeger*. 2021 Apr 26;183(17):V10200751.

Berthelsen MF, Riedel M, Cai H, **Skaarup SH**, Alstrup AKO, Dagnæs-Hansen F, Luo Y, Jensen UB, Hager H, Liu Y, Callesen H, Vendelbo MH, Jakobsen JE, Thomsen MK. The CRISPR/Cas9 Minipig—A Transgenic Minipig to Produce Specific Mutations in Designated Tissues. *Cancers* 2021, 13, 3024. <https://doi.org/10.3390/cancers13123024>

Borg M, Løkke A, **Rasmussen TR**. Symptoms and lung function follow-up after lung cancer resection. *Dan Med J*. 2021 Sep 15;68(10)

Cronin-Fenton D, Dalvi T, Movva N, Pedersen L, Hansen H, Fryzek J, Hedgeman E, Mellempgaard A, **Rasmussen TR**, Shire N, Hamilton-Dutoit S, Nørgaard M. PD-L1 expression, EGFR and KRAS mutations and survival among stage III unresected non-small cell lung cancer patients: a Danish cohort study. *Sci Rep*. 2021 Aug 19;11(1):16892.

Samson MH, Abildgaard AM, Espelund U, **Rasmussen TR**, **Folkersen B**, Frystyk J, Nexø E. Circulating trefoil factors in relation to lung cancer, age and lung function: a cross-sectional study in patients referred for suspected lung cancer. *Scand J Clin Lab Invest*. 2021 Oct;81(6):446-450. Epub 2021 Jul 9.

Hedgeman E, Nørgaard M, Dalvi T, Pedersen L, Hansen HP, Walker J, Midha A, Shire N, Boothman AM, Fryzek JP, Rigas J, Mellempgaard A, **Rasmussen TR**, Hamilton-Dutoit S, Cronin-Fenton D. Programmed cell death ligand-1 expression and survival in a cohort of patients with non-small cell lung cancer receiving first-line through third-line therapy in Denmark. *Cancer Epidemiol*. 2021 Aug;73:101976. Epub 2021 Jul 1.

#### **Interventions (4 publications)**

**Kronborg-White S**, **Srithanan SS**, Madsen LB, **Folkersen B**, **Voldby N**, **Poletti V**, **Rasmussen TR**, **Bendstrup E**. Integration of cryobiopsies for interstitial lung disease diagnosis is a valid and safe diagnostic strategy – experience based on 250 biopsy procedures. *J. Thorac. Dis*. 2021; 13: 1455-1465.

Davidsen JR, Laursen CB, Højlund M, Lund TK, Jeschke KN, Iversen M, Kalhauge A, **Bendstrup E**, Carlsen J, Perch M, Henriksen P, Schultz HHL. Lung Ultrasound to Phenotype Chronic Lung Allograft Dysfunction in Lung Transplant Recipients. A Prospective Observational Study. *J. Clin. Med*. 2021 Mar 5;10(5):1078.

Pietersen PI, Jørgensen R, Graumann O, Konge L, **Skaarup SH**, Lawaetz Schultz HH, Laursen CB. Training Thoracic Ultrasound Skills: A Randomized Controlled Trial of Simulation-Based Training versus Training on Healthy Volunteers. *Respiration*. 2021;100(1):34-43.

**Kronborg-White S**, **Bendstrup E**, Gori L, Luzzi V, Madsen LB, **Poletti V**, **Rasmussen TR**, Trigiani M, Vezzosi S, Tomassetti S. A pilot study on the use of the super dimension navigation system for optimal cryobiopsy location in interstitial lung disease diagnostics. *Pulmonology* 2021; 1-5.

### Rare lung diseases (23 publications)

**Prior TS**, Hoyer N, Hilberg O, Shaker SB, Davidsen JR, Rasmussen F, **Bendstrup E**. Clusters of comorbidities in idiopathic pulmonary fibrosis. *Resp. Med.* doi.org/10.1016/j.rmed.2021.106490

**Møller J**, Altraja A, Sjøheim T, Rasmussen F, Madsen LB, **Bendstrup E**. International multidisciplinary team discussions on the diagnosis of idiopathic non-specific interstitial pneumonia and the development of connective tissue disease. *European Clinical Respiratory Journal* 2021. <https://doi.org/10.1080/20018525.2021.1933878>

Wijsenbeek MS, **Bendstrup E**, et al. Disease Behaviour During the Peri-Diagnostic Period in Patients with Suspected Interstitial Lung Disease: The STARLINER Study. *Adv Ther.* <https://doi.org/10.1007/s12325-021-01790-y>

Maier TM, **Bendstrup E**, Dron L, Langley J, Gerald Smith G, Khalid JM, Patel H, Kreuter K. Global incidence and prevalence of idiopathic pulmonary fibrosis. *Maier et al. Respir Res* (2021) 22:197.

Jessen H, Hoyer N, **Prior TS**, Frederiksen P, Karsdal MA, Leeming DJ, **Bendstrup E**, Sand JMB, Shaker SB. Turnover of type I and III collagen predicts progression of idiopathic pulmonary fibrosis. *Resp. Res.* 2021; 22:205.

Durheim MT, **Bendstrup E**, Carlson L, Sutinen EM, Hyldegaard C, Kalafatis D, Myllärniemi M, Sköld CM, Sjøheim T. Outcomes of patients with advanced idiopathic pulmonary fibrosis treated with nintedanib or pirfenidone in a real-world multicentre cohort. *Respirology* 2021.

Glaspole I, Bonella F, Bargaglia E, Glassberg MK, Caaro F, Stansen W, Quaresma M, Orsetti L, **Bendstrup E**. Efficacy and safety of nintedanib in patients with idiopathic pulmonary fibrosis who are elderly or have comorbidities. *Resp. Res.* 2021; 22 (1): 125.

Hoyer N, Jessen H, **Prior TS**, Sand JMB, Leeming DJ, Karsdal MA, Åttingsberg EKA, Vangsgaard GKM, **Bendstrup E**, Shaker SB. High turnover of types III and VI collagen in progressive idiopathic pulmonary fibrosis. *Respirology* 2021 Apr 9. doi: 10.1111/resp.14056. Online ahead of print.

Kalluri M, Luppi F, Vancheri A, Vancheri C, Balestro E, Varone F, Mogulkoc N, Cacopardo G, Bargaglia E, Renzoni E, Torrisi S, Calvello M, Libra A, Pavone M, Bonella F, Cottin V, Valenzuela C, Wijsenbeek M, **Bendstrup E**. Patient-reported outcomes and patient-reported outcome measures in interstitial lung disease: where to go from here? *Eur. Resp. Rev.* 2021;30: 210026 [DOI: 10.1183/16000617.0026-2021]

Hoffmann-Vold AM, **Bendstrup E** et al. *Rheumatology (Oxford)* 2021 Feb 15; keab154. Identifying unmet needs in SSC-ILD by semiquantitative in-depth interviews.

Cottin V, **Bendstrup E**, et al. *Eur Respir J.* 2021; 57: 2100079. The case of methotrexate and the lung: Dr. Jekyll and Mr. Hyde.

Tzouveleki A, Antoniou K.....**Bendstrup E**, et al. The DIAMORFOSIS (DIAGNOSIS and Management Of lung cancer and FibrOSIS) survey: international survey and call for consensus. *ERJOpen* 2021. <https://doi.org/10.1183/23120541.00529-2020>.

Funke-Chambour M, ....**Bendstrup E** et al. Suggestions for improving clinical utility of future guidelines for diagnosis and management of IPF – results of a Delphi survey. *Eur Respir J* 2021

Kreuter M, Hoffmann-Vold AM, **Bendstrup E**. Interstitial lung diseases: quo vadis? *Lancet Resp Med* 2021.

Polke M, Kondoh Y, Wijssenbeek M, Cottin V, Walsh SLF, Collard HR, Chaudhuri N, Avdeev S, Behr J, Calligaro G, Corte TJ, Flaherty K, Funke-Chambour M, Kolb M, Krisam J, Maher TM, Molina Molina M, Morais A, Moor CM, Morisset J, Pereira C, Quadrelli S, Selman M, Tzouveleakis A, Valenzuela C, Vancheri C, Vicens-Zygmunt V, Wälscher J, Wuyts W, **Bendstrup E**, Kreuter M. Management of Acute Exacerbation of Idiopathic Pulmonary Fibrosis in Specialised and Non-specialised ILD Centres Around the World. *Frontiers in Medicine* 2021

Younus S, Bakal JA, Richman-Eisenstat J, Alrehaili G, Aldhaheri S, Morales M, Rippon N, **Bendstrup E**, Harle I, Moran-Mendoza O, Barratt SL, Adamali H, Kalluri M. Comparison of Palliative Care Models in Idiopathic Pulmonary Fibrosis. *Applied Sciences* 2021.

**Prior TS**, Hoyer N, Shaker SB, Davidsen JR, Hilberg O, Patel H, **Bendstrup E**. Validation of a derived version of the IPF-specific Saint George's Respiratory Questionnaire. *Resp. Res.* (2021) 22:259.

Hylgaard C, **Bendstrup E**, Pedersen AB, Pedersen L, Ellingsen T. Interstitial Lung Disease in Connective Tissue Diseases: Survival Patterns in a Population-Based Cohort. *J. Clin. Med.* 2021, 10, 4830. <https://doi.org/10.3390/jcm10214830>

**Cerdán de Las Heras J**, Balbino F, Løkke A, Catalán-Matamoros D, Hilberg O, **Bendstrup E**. Tele-Rehabilitation Program in Idiopathic Pulmonary Fibrosis—A Single-Center Randomized Trial. *Int. J. Environ. Res. Public Health.* 2021, 181, 16.

**Kronborg-White S**, Madsen, LB, **Bendstrup E**, **Poletti V**. PD-L1 Expression in Patients with Idiopathic Pulmonary Fibrosis. *J. Clin. Med.* 2021.

**Kølnner-Augustson L**, **Prior TS**, **Skivild V**, **Aalestrup A**, **Bendstrup E**. Fatigue in idiopathic pulmonary fibrosis measured by the Fatigue Assessment Scale during antifibrotic treatment. *European Clinical Respiratory Journal* 8 (1), 1853658

**Sritharan SS**, **Kølnner-Augustson L**, **Kronborg-White S**, **Prior TS**, **Møller J**, **Bendstrup E**. Behandling af progressiv fibrotisk interstitiel Lungesygdom. *Ugeskr Læger* 2021;183:V04210348

Enemark A, Jönsson ÅLM, **Kronborg-White S**, **Bendstrup E**. Pulmonary Alveolar Microlithiasis - A review. *Yale J Biol Med.* 2021 Dec 29;94(4):637-644.

#### **Lung infections (4 publications)**

Skaarup KG, Lassen MCH, Espersen C, Lind JN, Johansen ND, Sengeløv M, Alhakak AS, Nielsen AB, Ravnkilde K, Hauser R, Schöps LB, Holt E, Bundgaard H, Hassager C, Jabbari R, Carlsen J, Kirk O, Bodtger U, Lindholm MG, Wiese L; Kristiansen OP, Walsted ES, Nielsen OW, Lindegaard B, Tønder N, Jeschke KN, Ulrik CS, Lamberts M, Sivapalan P, Pallisgaard J, Gislason G, Iversen K, Jensen JUS, Morten M, **Skaarup SH**, Platz E, Sørensen TB. Lung ultrasound findings in hospitalized COVID-19 patients in relation to venous thromboembolic events: the ECHOVID-19 study. *Journal of Ultrasound* <https://doi.org/10.1007/s40477-021-00605-8>.

**Sperling S**, Mortensen KL, Gjørup P, Fløe F, Hilberg O. Bakterielle lungeabscesser. *Ugeskr Læger* 2021;183:V12200948

Cecilie Norup Thomsen CN, **Sperling S**, Fledelius J, Gjørup PH. Rare nocardiosis in danish patient with diabetes. *Eur. Clin. Resp. J.* 2021, 8, 1882030.

Staerke NB, Smidt-Hansen T, Oldenborg L, Jensen TT, Weinreich UM, Shakar S, Wejse C, Hilberg O, **Fløe A**. High yield from repeated testing for tuberculosis among high-risk citizens in Denmark. *Int J Infect Dis*. 2021 Jan;102:352-356. doi: 10.1016/j.ijid.2020.10.076. Epub 2020 Oct 31.

PhD thesis

Birgit Refsgaard Iversen defended her PhD thesis: "The impact of affiliation to a cross-sectorial lung team for patients with chronic obstructive pulmonary disease at risk of exacerbations" in April 2021.

## Funding 2021

In 2021 funding was obtained from the following funds:

Balslevs mindefond: 500.000 DKK for “Microbiome in asthma patients”

Danish Cancer Society: 1.150.000 DKK “Improved Long Term Survival for Danish Lung Cancer Patients”

Novo Nordisk Foundation: 1.000.000 DKK “LOTUS study”

Skibsreder Per Henriksen, R. og hustrus fond: 300.000 “LOTUS study”

Dansk lungemedicinsk selskab: 50.000 “LOTUS study”

Trial Nation: 92.000 “LOTUS study”

Department of Clinical Medicine: 120.000 “LOTUS study”

Pulje for sundhedsvidenskabelige professioner på AUH: 225.000 DKK “The outgoing lung team – patient and relatives involvement in a cross-sectorial cooperation”

Innovation Fund Denmark: 15.300.000 “ILIT.NU”

Aarhus University Hospital: 7.500.000 “ILIT.NU”

Aarhus University: 2.500.000 “ILIT.NU”

Galapagos, unrestricted Grant: 96.000

### **Overall aim**

Through research to improve the diagnosis, management and care of patients with respiratory or allergic diseases

### **Goals**

Our research strategy supports the overall research strategy at Aarhus University Hospital.

- To be leading in research in Interstitial lung disease, pulmonary interventions and allergy in Denmark
- To have an attractive research environment interesting for national and international partners
- To deliver high-quality research for the pharmaceutical industry

### **Aim**

- Visible research for all partners e.g., patients, patient societies and collaborators
- > 40 publications annually in peer-reviewed journals
- All staff members participate and help with research
- $\geq 1$  new PhD students each year
- All new PhD students should have an international supervisor
- > 2 major funding applications annually

### **Strategy**

- 2 annual thematic research meetings
- 2 monthly journal clubs (pulmonology and asthma/allergy)
- Interdisciplinary research
- Involvement of patient and relatives
- Write a column in the newsletter of the Department
- Uniform layout for posters and PowerPoint presentations with respect to research area
- Make research visible for patients and patient organizations
- Participate with posters at the annual meeting in the Danish Respiratory Society



Contact information

**Elisabeth Bendstrup**  
Professor

Tel: +45 7846 1115  
karbends@rm.dk

**Mette Toft**  
Professor secretary

Tel: +45 7846 2106  
mettflas@rm.dk

