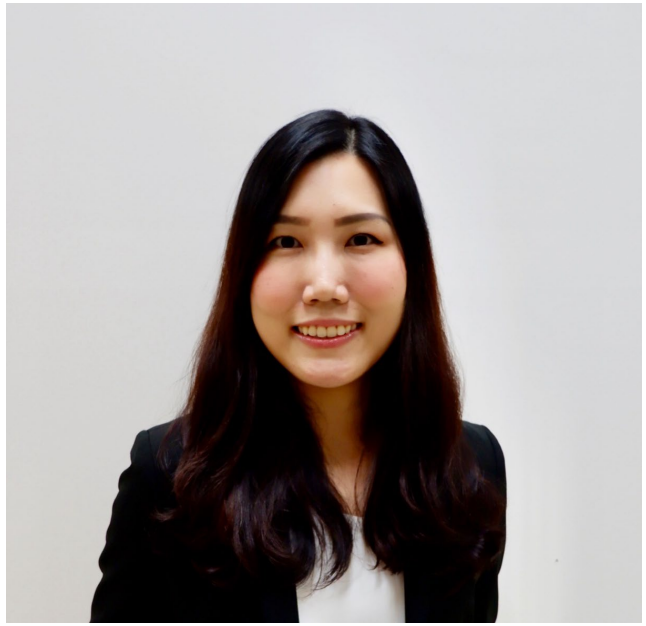
ATS 2025 Highlights

Respiratory Structure and Function Early Career Professionals

Get to know members of the RSF Assembly



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Is your research clinical, basic science or translational?

Clinical and translational research.

Tell us about your research

My research focuses on severe asthma, particularly the mechanisms driving its progression and exacerbations, to enable more precise treatments. Our work highlights the role of non-T2 inflammatory pathways. Through genetic studies, we identified ciliary dyskinesia-related gene abnormalities in patients with neutrophilic exacerbated severe asthma and confirmed their association with ciliary motility defects through functional analyses.

Where do you see yourself in 5 years?

In 5 years, I envision myself back in my hometown, Bangkok, Thailand, contributing as both a pulmonologist and scientist at a university hospital. My goal is to establish a research program to advance medical knowledge, improve patient care for respiratory diseases, and mentor future physician-scientists.

What do you find is the major benefit of RSF Assembly Membership?

The RSF Assembly Membership offers a unique opportunity to connect with leading pulmonologists and scientists across diverse research areas. It fosters collaboration, idea exchange, and the ability to stay updated on advancements in respiratory structure and function.

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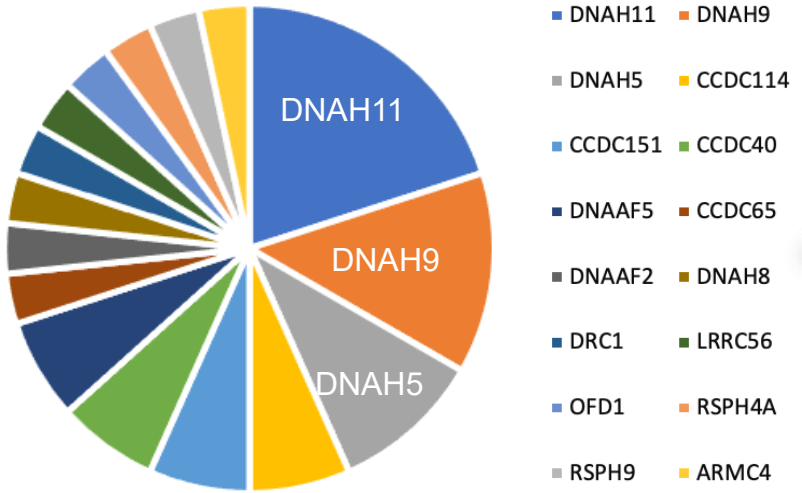

Abnormal PCD-related genes were identified from 23 patients. In total, 30 abnormal variants were detected across 16 genes, classified into 1 pathogenic variant, 7 likely pathogenic variants, and 22 variants of uncertain significance.

Unrecognized Ciliary Motility Disorders in Neutrophilic Severe Asthma Exacerbation

Objective: To report our experience of identifying ciliary motility disorders as contributors to neutrophilic exacerbations in patients with severe asthma referred to a tertiary university clinic for consideration of initiation or switching a biologic, employing Exome Sequencing in blood.

Methods: Whole exome sequencing for a primary ciliary dyskinesia (PCD) and immunodeficiency panel (Blueprint Genetics, Seattle, WA) was performed on 37 consecutive patients referred to our clinic, between October 2018 and September 2023, with a physician diagnosis of severe asthma. PCD panel was requested on patients with ≥3 episodes of respiratory infection or intense sputum neutrophilia (total cell count >25 million cells/g and neutrophils >65%) and evidence of a type 2-immune inflammation (peripheral or sputum eosinophilia, raised exhaled nitric oxide, or raised serum immunoglobulin E), without another evidence of immunodeficiency. Nasal epithelial brushings were obtained in a subset of patients with abnormal PCD gene mutations, and ciliary beat frequency (CBF) was assessed using a High-Speed Digital Imaging Setup for data acquisition.

Results: All 37 patients (age 55.66±14.31; 46% male) were referred to our center with a previous diagnosis of severe asthma. They were on moderate to high doses of ICS (median dose 1000 mcg of fluticasone propionate or equivalent) or OCS (median prednisone dose 6.75±5 mg). 13.51% were on biologics. 23/37 (62.16%) had a mutation associated with PCD genes. Ciliary beat frequency was reduced in all 14 patients in whom motility studies were performed (median of 9.01±5.45 Hz) (normal 14.2±1.0 Hz). Treatment with hypertonic saline led to a 40.38%/70.18% reduction in the dose of ICS/OCS and the decision not to use a biologic in 85% of patients. Moreover, despite the reduction in the dose of maintenance steroids, there was no decline in FEV1, with a mean improvement of 0.023L (1.13%).

Conclusion: 62% of patients with severe asthma with a history of recurrent airway infections (and evidence of a T2 inflammatory process) had mutations associated with ciliary proteins. All of them had reduced ciliary beat frequency. The heterozygous mutation of PCD-related genes, even if labelled as a variant of uncertain significance, could contribute to impaired ciliary function and recurrent airway infection. It is important to recognize ciliary motility disorders as contributors to airway infections in patients with severe obstructive lung diseases to provide effective treatment (with hypertonic saline) and limit unnecessary use of biologics.

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