

Patient-Reported Sputum Color Reflects Airway Inflammation and Exacerbations in Bronchiectasis

Glenview, IL (October 12, 2026) – Patient-reported sputum color was associated with neutrophil serine protease (NSP) activity and disease activity in patients with bronchiectasis, according to a post hoc analysis of data from the phase III ASPEN trial.

“Sputum is a noninvasive marker of airway inflammation, with purulence reflecting the presence and activity of neutrophils in the airways. Its color is considered an indicator of bronchiectasis disease activity, severity, and inflammation.” said James Chalmers, MBChB, PhD, a CHEST 2026 presenting author. “It’s a valuable tool for monitoring bronchiectasis exacerbations. With the recent FDA approval of brensocatib for the treatment of bronchiectasis in adults and adolescents, we wanted to evaluate its impact on sputum color.”

Researchers evaluated the association between patient-reported sputum purulence and NSP activity and assessed the impact of brensocatib treatment according to baseline sputum purulence and during pulmonary exacerbations.

Adult patients in the ASPEN trial with at least two pulmonary exacerbations in the 12 months before screening were randomized 1:1:1 to receive once-daily brensocatib 10 mg, brensocatib 25 mg, or placebo for 52 weeks. Patients completed the Bronchiectasis Exacerbation and Symptom Tool (BEST) diary daily, including an assessment of sputum purulence using a six-point color scale. Sputum samples from a subset of patients were assessed for neutrophil elastase (NE), cathepsin G (CatG), and proteinase 3 (PR3).

In a pooled analysis across treatment arms, 326 patients had corresponding sputum NSP data. At baseline, 36.2% reported mucoid sputum, 43.9% reported mucopurulent sputum, and 19.9% reported purulent sputum. Greater sputum purulence was associated with higher NE activity at baseline and throughout the treatment period, with similar trends observed for CatG and PR3. Greater sputum purulence at baseline was also associated with greater disease activity, including increased sputum neutrophil counts, *Pseudomonas aeruginosa* positivity, exacerbation rates, and bronchiectasis-computed tomography scores, as well as decreased postbronchodilator FEV₁.

Treatment with brensocatib was associated with greater reductions in NE activity than placebo across all sputum purulence categories, with similar trends observed for CatG and PR3. Sputum purulence increased across treatment arms during pulmonary exacerbations regardless of severity. However, brensocatib 10 mg and 25 mg reduced sputum purulence scores compared with placebo during severe exacerbations.

The findings suggest that greater patient-reported sputum purulence was associated with increased NSP activity and overall disease activity at baseline.

Further results will be presented at the CHEST Annual Meeting 2026 as part of the CF and Non CF Bronchiectasis Management rapid fire original investigation presentations titled, *Patient-Reported Sputum Color and its Association With Neutrophil Serine Proteases and Exacerbations in Patients With Bronchiectasis: A Post Hoc Analysis From the ASPEN Trial*. The [study abstract](#) can be viewed on the *CHEST*® journal website.