The oral cavity is an important portal for ingress of SARS-CoV-2, being an entryway to the bronchial tubes, alveoli, and the rest of the lower respiratory tract, in which inflammation by viral infection is caused. There is the possibility that aspiration of oral bacteria in saliva into the lower respiratory tract may be a complicating factor for COVID-19. Periodontitis is also a risk factor for pneumonia and the exacerbation of chronic obstructive pulmonary disease, presumably because of the aspiration of saliva contaminated with periodontopathic bacteria into the lower respiratory tract. Patients with these diseases have increased rates of COVID-19 aggravation and mortality. Because periodontopathic bacteria have been isolated from the bronchoalveolar lavage fluid of patients with COVID-19, periodontitis may be a risk factor for COVID-19 aggravation. However, the molecular links between periodontitis and COVID-19 have not been clarified.

**Methods:** Real-time PCR and ELISA were used to investigate induction by culture supernatant of Fusobacterium nucleatum (CSF) for expression of ACE2 and proinflammatory cytokines by human respiratory epithelial cells.

**Result:** We found that the CSF upregulated the ACE2 in A549 alveolar epithelial cells. In addition, CSF induced IL-6 and IL-8 production by both A549 and primary alveolar epithelial cells. CSF also strongly induced IL-6 and IL-8 expression by BEAS-2B bronchial epithelial cells and Detroit 562 pharyngeal epithelial cells.

**Conclusion:** These results suggest that when patients with mild COVID-19 frequently aspirate periodontopathic bacteria, SARS-CoV-2 infection is promoted, and inflammation in the lower respiratory tract may become severe in the presence of viral pneumonia.

**P2-41 | Porphyromonas gingivalis gingipains potentially affects MUC5AC gene expression and protein levels in respiratory epithelial cells**

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**Introduction:** It has long been established that periodontal diseases contribute to a particular set of pulmonary diseases, such as pneumonia and COPD. However, a causal relationship between periodontopathic bacteria and the onset of pneumonia and COPD has not yet been established. Under normal conditions, mucus clearance occurs in the host as a first line of defense against airborne pathogens and pollutants, however, under pulmonary disease conditions like pneumonia and COPD, mucus hypersecretion occurs, potentially contributing to disease pathology and mortality. In addition, of the numerous mucins found in airway epithelial cells, MUC5AC and MUC5B comprise approximately 90% of overall mucin content and more importantly, MUC5AC expression and protein levels are elevated in pneumonia and COPD patients. Therefore, Porphyromonas gingivalis (Pg) may influence both MUC5AC expression and protein levels in airway epithelial cells, potentially contributing to the aggravation of pneumonia and COPD. Here, the remit of this study was to establish whether Pg virulence factors affected MUC5AC in immortalized and primary bronchial cells.

**Result:** MUC5AC gene expression and protein levels are affected by Pg culture supernatant, but not by lipopolysaccharide or FimA fimbriae. Cells treated with either Pg single (Kgp or Rgp) or double (Kgp/Rgp) mutants had altered levels of MUC5AC gene expression and protein levels, and MUC5AC staining of double mutant-treated mouse lung cells showed that MUC5AC protein levels were unaffected.

**Conclusion:** Pg gingipains may be the primary virulence factor that influences both MUC5AC gene expression and protein levels, potentially contributing to pneumonia and COPD aggravation.

**P2-42 | Effects of protease-activated receptor antagonist on steroid insensitive airway inflammation induced by LPS in mice**

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**Background and Aims:** Chronic obstructive pulmonary disease (COPD) and asthma are chronic inflammatory diseases of the lung that present with airway hyperresponsiveness and bronchoconstriction. In many cases, inhaled corticosteroids and bronchodilators provide sufficient therapeutic effects, but in patients with COPD and severe asthma, these current therapies are not able to completely control these symptoms. Recently, several studies have shown that the coagulation system is involved in inducing airway inflammation in these diseases. In this study, we investigated the inhibition effects of the coagulation cascade on lipopolysaccharide (LPS)-induced steroid insensitive airway inflammation in mice.

**Methods:** A/J mice (male) were intranasally administered to LPS and accumulation of inflammatory cells, CXCL1 and osteopontin in bronchoalveolar lavage fluid (BALF) were determined by flow cytometry and ELISA, respectively. Histological changes in the lung were evaluated by H&E staining.

**Results and Conclusions:** LPS exposure showed significantly increased the number of neutrophils in BALF of mice. Dabigatran inhibited the LPS-induced increase in neutrophils. In addition, dabigatran also inhibited increased production of CXCL1 and osteopontin in BALF induced by LPS exposure. However, LPS-induced airway inflammation was not relieved by fluticasone propionate. Furthermore, SCH79797, a protease-activated receptor antagonist, inhibited neutrophilia, chemokine and cytokine production.