Alteration of Mucin Glycosylation in Airway Diseases

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Mucin, a highly glycosylated protein (over 50% carbohydrates per weight), is constantly expressed as extracelluar matrix including membrane-tethered types. Mucin is overproduced in airway diseases such as rhinosinusitis and rhinitis, which contributes to mucus obstruction of airways. In case of cystic fibrosis, there are changes in the amounts and carbohydrate composition of mucin by increased glycosyl-transferase expression. We have investigated carbohydrate alterations in mucin samples of chronic and acute rhinosinusitis and allergic rhinitis patients. Monosaccharide composition analysis revealed that the amount of sialic acid, an acidic monosaccharide, was increased by about 25% in chronic rhinosinusitis than the other diseases. The increase of sialic acid could be related to be acidification in airway diseases with more secretion of mucin, as well as sulfation. Further studies will unveil oligosaccharide structures in each disease with MALDI-ToF mass spectrometry and the relation between glycan structures and glycosyl-transferase expression.