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## Relevance of Machine Learning Approach in Analysing Metabolomic Data to gain insights on Comorbidity issues in COPD & Asthma

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**Background:** Comorbidity is usually defined as a disease coexisting with the disease of interest. Chronic obstructive pulmonary disease (COPD) and Asthma are the most frequent causes of respiratory ill health, covering all ages and several cases of comorbidity between the two conditions have been reported. Asthma and COPD are different diseases each with a unique natural history and pathophysiology, but differentiating the underlying cause of their symptoms is difficult and often leads to generalized treatment protocols. Metabolomics involves quantitative measurement of time-related multi-parametric metabolic response of living systems to pathophysiological stimuli or change in gene expression profile. Over the past few years a number of studies especially employing Mass Spectrometry and NMR have emerged to identify the presence of metabolite markers specific to Asthma and COPD. The study aims at identifying a consensus metabolic profile of Asthma and COPD using text mining based machine learning approach and gain understand the underlying mechanism causing comorbidity.

**Lacunae:** There is little information available on metabolite profile specific for COPD and Asthma, such knowledge would be invaluable in gain Insights on comorbidities between the 2 conditions..

**Methodology:** Comprehensive text mining was carried to enlist all eligible studies on metabolomic profiling studies to recognize specific metabolite signatures common for Asthma and COPD and employ Machine learning approaches to gain Insights on comorbidity issues between the 2 conditions.

**Results & Conclusions:** Modeling using Machine Learning like ANN, SVM, GA approaches were used to get quantitative effects of exogenous compounds on pathogenesis of COPD and Asthma. Metabolic profiling through the use of pattern recognition statistics on metabolite signals has the potential to identify specific signatures for COPD and Asthma which can aid in differential diagnosis and also to gain understanding on the comorbidity between the 2 disorders. Such knowledge would help in accurate diagnostics and to devise a novel management technique for COPD and Asthma. The results will be presented and discussed.

### Biography

P K Ragunath graduated in March 1983 from Vivekananda College, Chennai, affiliated to University of Madras. He obtained Post Graduate Degree from Pachaiyappa's College, Chennai and MPhil degree from Madras University. Later he completed PhD in Madras Medical College, Chennai, affiliated to The Tamil Nadu MGR University Chennai. In addition, he has completed many degree/certificate programs in Management and information Technology. He has published 15 research articles in peer-reviewed journals and has also presented around 15 papers in national and international conferences. He is holding membership in many 'World 'renowned organizations' catering to the Bioinformatics & Medical Informatics.

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**Notes:**

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