

Predicting the Role of SERPINA1 DNA Methylation in Chronic Obstructive Pulmonary Disease and Anaemia and Identification of 3 Novel Methylation Sites

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ABSTRACT Anaemia and chronic obstructive pulmonary disease (COPD) are the common blood and respiratory disorders respectively. The proper lung function is maintained by the *SERPINA1* gene predominantly that encodes for alpha 1 antitrypsin protein, which also regulates the iron homeostasis of the human body, whereas imbalance in the iron homeostasis may result in the anaemic condition. The altitudinal variations influence anaemia and COPD. DNA methylation is involved in the early developmental processes, which influences the gene functioning without altering the sequence. The current study has been aimed at analyzing the inter-relationship between anaemia and COPD with DNA methylation of the *SERPINA1* gene under altitudinal changes. The methodology involves the DNA isolation, bisulfite conversion and sequencing of the *SERPINA1* gene. The results of the current study have shown that *SERPINA1* DNA methylation did not significantly involve anaemia and COPD irrespective altitudes, but 3 novel CpG sites cg94377701, cg94389678 and cg94389930 were identified in the *SERPINA1* gene of anaemia and COPD patients.