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Matrix metalloproteinases in development of COPD

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The main pathological features of COPD are abnormal chronic inflammation in the airways, development of extensive tissue remodeling and local and systemic oxidative stress. A growing body of evidence indicates that matrix metalloproteinases (MMPs) play a pivotal role in remodeling of the small airways and particularly of the terminal bronchioles in lungs of COPD patients. In the current review, we aim to present our results concerning the possible role of several functional SNPs in promoter regions *of MMPs (MMP-1607 1G>2G, [rs1799750], MMP2–1306C>T [rs243865], MMP3-1171 5A>6A, [rs3025058], MMP7-181A>G [rs11568818],* and *MMP12-82A>G [rs2276109])* and serum levels of those proteinases in development of COPD in Bulgarian population from the central region of the country. The performed case-control studies showed that *MMP2–1306C>T, MMP7-181A>G* and *MMP12-82 A>G* may affect the risk for COPD, while the other promoter SNPs did not have any associations with COPD. The old carriers (≥65 years) of minor T allele genotypes (CT+TT) of *MMP2–1306C>T* SNP had higher risk than CC carriers (OR=4.54, 95%CI:1.20-17.24, gender and age adjusted, p=0.026). Concerning *MMP7-181A>G* SNP, we observed that the minor G allele genotypes (AG+GG) were more frequent in COPD than AA genotype among the younger individuals (OR=2.30, 95%CI:1.00-5.27, gender and age adjusted, p=0.050). Moreover, patients with minor G allele genotypes developed COPD significantly early that those with AA genotype (61.01±10.11 vs. 64.87±9.00 years, p=0.032). The minor G allele of *MMP12-82 A>G* SNP appeared to be a protective factor for COPD as the carriers of G allele genotypes had about 2-fold lower risk for the disease (OR=0.446, 95%CI:0.25-0.80, adjusted for gender and age, p=0.007). The serum levels of MMP-1 and MMP-7 did not differ significantly between patients and controls, while the MMP-3 appeared to be higher in patients with COPD (p=0.020), and MMP-2 was higher in female COPD patients than healthy women (p=0.043).

Biography

Tatyana Vlaykova is a Professor in Medical Biochemistry in Medical Faculty, Trakia University, Stara Zagora and Medical University, Plovdiv. She obtained a PhD degree in Department of Oncology, Medical Faculty, Turku University, Turku, Finland, focusing on tumor angiogenesis, apoptosis and proliferation markers as predictive and prognostic factors of skin metastatic melanoma. Later, she extended her interest and expertise in analyzing the risk and prognostic factors in colorectal cancer and of chronic inflammatory lung diseases as COPD and bronchial asthma. In those latter fields, she has been studying the genetic predisposition factors for COPD as polymorphisms in the genes encoding xenobiotic-metabolizing enzymes of GST family, cytokines (IL-6, IL-1B, TNF-□, IL-10, IL-1Ra) and several matrix metalloproteinases. She is a Supervisor of six PhD students and Tutor of the research work of many undergraduate students in medicine.

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