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The interplay of Δ133p53 with p53 and its target genes in lung cancer

Δ133p53 isoforms of the tumor suppressor gene p53, have been shown to be regulators of the cell cycle and apoptosis as they are activated in stress conditions. Δ133p53 isoforms along with the key partners of p53 and in particular the apoptotic factors MDM-2, PUMA and the cell cycle regulator p21, are considered to be responsible for the regulatory processes in cancer. Increased Δ133p53 levels have been found in various types of cancer including lung cancer. The aim of the present study is to evaluate how changes in the expression of Δ133p53 isoforms, following overexpression or silencing experiments, affect the expression of both p53 and its target genes. The human lung fibroblast cell line MRC-5 and the cancerous human lung alveolar epithelial cell line A549 were utilized in this study as in vitro models of normal and cancerous lung cell lines respectively. Overexpression and silencing experiments of p53 and Δ133p53 isoforms were performed. The effect of their overexpression as well as their silencing studied both at the transcriptional and translational levels, on p53 as well as on its target genes. The overexpression of full length p53 transcript led to the upregulation of p21 and downregulation of Δ133p53 transcripts in A549 cell line. Similarly, silencing of full length p53 led to the downregulation of p21 transcripts in A549 cell line. The overexpression of Δ133p53 transcript promoted the downregulation of p21 and MDM-2 whereas the levels of PUMA transcript remained the same. These results come in agreement with previous published data enhancing Δ133p53 mRNA level potential use as a biomarker in lung cancer.

Keywords: p53, Δ133p53 isoforms, lung cancer

Biography:

Dr. Fragou is a Laboratory reader in Biochemistry, in the laboratory of Biological Chemistry Medical School, AUSoM. She is a current Postdoc researcher and IKY grant holder for the Investigation of the regulatory role of Δ133p53 isoforms in tumor cell oncogenesis. During the academic years 2017-2019 she has been a Laboratory co-tutor in Basic Science Methodology, MSc Medical Research Methodology, AUTH. Dr. Fragou participated in the authorship of 11 scientific papers published in international journals, 5 articles published in conference peer-reviewed proceedings and 1 book chapter. Her work is cited in 141 articles (h-index=6).

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