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Oncostatin M Mediated Regulation of MicroRNA-21 Levels in Cancer Cell Lines

MicroRNA (miRNA) have been found to be dysregulated in a variety of cancers. Since miRNA regulate mRNA translation into protein, understanding miRNA regulation can provide insight into some of the mechanisms underlying the uncontrolled cell division that is characteristic of cancer. The endogenous human cytokine Oncostatin M (OSM) was identified in a miR-21 luciferase reporter assay as a likely regulator of miR-21. In this study, we investigated the mechanism of OSM mediated miR-21 regulation, including potential inhibition of miR-21 biogenesis or function, as well as OSM signaling pathways such as JAK/STAT that may result in downstream effects on miR-21.

Our miR-21 luciferase reporter assays allowed us to determine an optimal dose and length of time of OSM treatment; 24-hour exposure to 20 ng/mL OSM was chosen for future experiments. Attempts were then made to quantify miR-21 expression as well as the expression of PTEN and PDCD4, mRNA known to be regulated by miR-21, as a function of length of OSM treatment via quantitative polymerase chain reaction. The effects of OSM on miR-21 localization were then explored via fluorescent *in situ* hybridization and PTEN protein levels were detected by Western Blot in response to 24 hour OSM treatment.