Abstract: Cancer is one of the most substantial causes of mortality worldwide. This renders its prevention and treatment an overwhelming significance. Aberrant epigenetic alterations such as DNA methylation play a significant role in cancer development. Since epigenetic alterations are considered to be more easily reversible compared to genetic changes, epigenetic therapy is potentially very useful in reversing some of these defects. MEG3 is a tumor suppressor long non-coding RNA being expressed in the majority of normal tissues. Yet, methylation of MEG3 promoter region elicits the decrease in its expression in a variety of malignancies. Bioactive nutrients including curcumin offer great potential in altering DNA methylation status with the intention to prevention and treatment of cancer. DNA methylation is catalyzed via DNMT1, DNMT3A and 3B. The fundamental role of altered epigenetic modification patterns in tumorigenesis establishes epigenetic regulatory enzymes as important targets for cancer therapy. Herein, we aimed to investigate epigenetic effects of nanocurcumin on key factors of cancer. The appropriate treatment dose for cells was specified through MTT assay. Following exposure of cells to nanocurcumin, MEG3 expression was examined by q-PCR which exhibited the augmentation of MEG3 expression (p < 0.05). Bioinformatic analysis was conducted to designate the promoter regions crucial to epigenetic alteration. DNA methylation assay was studied via bisulfite sequencing technique. Following treatment with nanocurcumin, expression of DNMT1, DNMT3A and 3B, was examined by q-PCR which exhibited downregulation of DNMTs expression (p < 0.05). Thus, we conclude that nanocurcumin can induce DNA hypomethylation and re-expression of silenced tumor suppressor genes in cancer cells.

Cancer, nanocurcumin, epigenetic, long non coding RNA MEG3, DNMT

Presentation: Poster