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Transfecting miR-20a-5p miRNA mimic to inhibit the autophagy pathway in highly aggressive HOS 143B osteosarcoma cell line

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In children and teenagers, osteosarcoma is the most common kind of bone tumour. Due to the chemo resistance ability of osteosarcoma, the survival rate has remained unimproved and stayed under 20%. The mechanism behind this resistance is the ability of autophagy formation which enables the cancer cell to escape cell death. In order to overcome the mechanism behind resistance, which is autophagy development, it was aimed to target the autophagy formation pathway and inhibit the pathway using the miRNA mimic, miR-20a-5p.The osteosarcoma HOS 143B (highly aggressive) cell line was fast-forward transfected with miR-20a-5p mimic for 24 hours, and the Wild Type and Not Targeted Control were used as the control groups. The miRNA PCR was performed to measure the success level of transfection and RT-qPCR was performed to measure the gene expression level of ATG5, ATG7, p62, and LC3-I/LC3-II. The Western Blot method was applied to measure the protein expression levels of ATG5, ATG7, p62, and LC3-I/LC3-II.The results have shown that the transfection of the HOS 143B was a success and the miRNA expression level was increased. However, the gene expression level was not affected at protein level as the Western Blot data showed protein expression for all of the autophagy proteins. To conclude, the miR-20a-5p mimic transfection has increased the miRNA expression but, as of now, could not inhibit the autophagy gene expression. However, this data provides a future hope for transfecting the osteosarcoma cell lines with miRNA mimics in order to inhibit autophagy and enable the chemotherapy of doxorubicin and cisplatin. More studies are being performed.

Biography

Meral Gok is an MSc Cancer Biology and Therapeutics student at Middlesex University, United Kingdom. She has graduated from BSc Molecular Biology and Genetics at Istanbul University, Turkey. She is currently researching on osteosarcoma chemo resistance.

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