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MicroRNA-520a-5p displays a therapeutic effect upon chronic myelogenous leukemia cells by targeting STAT3 and enhances the anti-carcinogenic role of capsaicin

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Aberrant expression profiles of microRNAs (miRNAs) have been previously demonstrated for having essential roles in a wide range of cancer types including leukemia. Antiproliferative or pro-apoptotic effects of capsaicin have been reported in several cancers. We aimed to study miRNAs involved in the JAK/STAT pathway in chronic myeloid leukemia cell model and the effects of the capsaicin treatment on cell proliferation and miRNA regulation. miR-520a-5p expression was extremely downregulated in capsaicin treated cells. Repressing the level of miR-520a-5p by transient transfection with specific miRNA inhibitor oligonucleotides resulted in induced inhibition of proliferation in leukemic cells. According to bioinformatics analysis, STAT3 messenger RNA was predicted as a putative miR-520a-5p target; which was detected as a potential target by qRT-PCR and western blot analysis. Cell proliferation inhibition was enhanced upon knockdown of STAT3 by RNA interference applications, but when miR-520a-5p inhibitor was additionally transfected onto STAT3 silenced cells; cell viability was dramatically decreased in leukemia cells. Finally we observed the effects of capsaicin following miR-520a-5p inhibitor transfection upon cell proliferation, apoptosis and STAT3 expression levels. We determined that, downregulation of miR-520a-5p affected the proliferation inhibition enhanced by capsaicin and reduced STAT3 mRNA and protein expression levels and increased apoptotic cell number. In summary, miR-520a-5p displays a therapeutic effect by targeting STAT3 and impacting the anticancer effects of capsaicin; whereas capsaicin; potentially through the miR-520a-5p/STAT3 interaction, induces apoptosis and inhibits K562 leukemic cell proliferation with need of further investigation.

Biography

Burcin Tezcanlı Kaymaz has completed her PhD at the age of 29 years from Ege University Medical School, Medical Biology Department and continued Postdoctoral studies at the same University. She has published more than 20 papers in reputed journals, with directing and participating many projects. He has published more than 120 scientific articles, reviews/book chapters and presented more than 250 abstracts/posters/talks at conferences world-wide.

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