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Expression Validation of miR-149-5p targets in prostate cancer

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Abstract

Prostate cancer (PCa) is one of the leading causes of mortality in men. Current therapeutics for PCa are androgen depletion by castration or/and anti-androgen based treatments. Androgens are necessary for Androgen receptor (AR) to function as a transcription factor, AR then regulates the expression of genes which promote cancer cell proliferation. However, despite the therapeutic interventions recurred AR signaling, which is facilitated by the acquisition of mutations in AR and its amplification, cholesterol biosynthesis and alterations in the steroidogenesis continue promoting PCa carcinogenesis. Our research is focused on regulatory small RNA molecules know as microRNAs (miRNA) in PCa. Numerous miRNAs fine-tune the expression of multiple genes involved in posttranslational modification, cell proliferation, organogenesis, energy balancing and developmental regulation thus affecting cell proliferation, differentiation, and cell death. miRNA "replacement therapy" is highly promising as it can target the expression of carcinogenesis promoting AR and androgen signaling, the holy grail of PCa therapeutics. In this research project, we have tested the efficiency of miR-149-5p in controlling AR expression using a sensor luciferase reporter assay system in PCa cell culture model. We found a significant downregulation of AR reporter gene in PCa cells indicating the efficacy of miR-149-5p in controlling the growth of AR based tumors. Our result indicates miRNA mediated regulation of genes involved in PCa and therapeutic potential.