XI CONGRESSO INTERNACIONAL DE UROONCOLOGIA
VI SIMPÓSIO MULTIPROFISSIONAL DE URO-ONCOLOGIA
2 E 3 DE ABRIL DE 2020

Anti-miR-221 and anti-miR-222 inhibits cell proliferation in PC-3, prostate cancer cell line by inducing p27kip1 expression

Nayara I Viana, Ruan Pimenta, Vanessa R Guimarães, Juliana A Camargo, Gabriela Q Amaral, Vitoria G Nunes, Iran A Silva, Katia R M Leite, Miguel Srougi, Sabrina T Reis
Laboratório de Investigação Médica (LIM55) – Disciplina de Urologia
Faculdade de Medicina da Universidade de São Paulo

Introduction

p27Kip1 (CDKN1B) has been emerged as an important transcriptional regulator, associated with essential cellular functions as cell division cycle, respiration, RNA processing, translation and cell adhesion. Its deregulation has been involved in cancer and neurodegeneration. OncomiRs 221 and 222 have as target p27kip1 and are, also involved in tumorigenesis in many organs. Our aim was to evaluate the role of anti-miRNAs 221 and 222 and their target gene p27kip1 in castration-resistant (PC-3) PCa cell line.

Methods

PC3, castration-resistant cell line was transfected with anti-miR-221, 222 and their scrambled controls using Lipofectamine RNA iMAX (Invitrogen®). The cell cycle assays were performed by flow cytometry.

Results

Following transfection of anti-miR-221 and 222, there was a significant increase in p27kip1 gene expression, p=0,003 and p=0,0004, respectively (figure 1). The cell cycle assays showed an increase of cells in G0/G1 phase, p=0.009 for anti-miR-221 and p=0.0007 for anti-miR-222 and a significant reduction in G2/M phase (p=0.0004) for both anti-miRs. Proliferation was also decreased after transfection of both anti-miRs (p=0.0003) (figure 2).

Conclusion

p27Kip1 control by miR-221 and 222 may play an important role in the progression of PCa, since the inhibition of these microRNAs resulted in the interruption of the cell cycle (increased cell rates in G0 / G1 and reduction in G2 / M) and lower rates of proliferation.

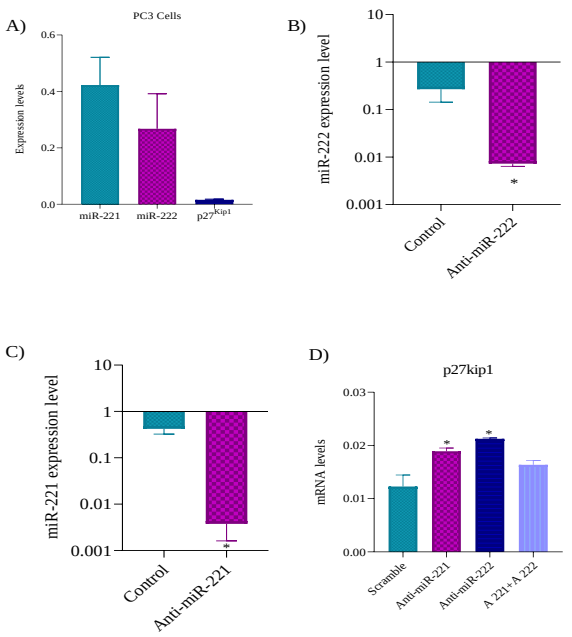

Figure 1. Basal levels of miR-221, miR-222 and p27Kip1 gene expression in the PC3 cell line (A). Underexpression of miR-222(B) and miR-221 (C) demonstrating the success of transfection in the PC3 cell line evaluated by qRT-PCR. p27Kip1 gene expression after transfection with Scramble, anti-miR-221, anti-miR-222 and Anti-miR-221+Anti-miR-222, respectively, in the PC-3 cell line (C). The bar graphs show mean and standard deviation values. *P<0.05.

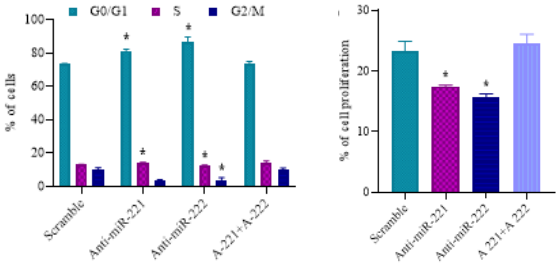

Figure 2. After 48-hours of anti-miR-221 and 222 transfection there was a significant increase in G0/G1 phase of the cell cycle, and a decrease in G2/M phase Cell viability assay * P <0.05.

Funding source: grant 2015/03582-6 Sao Paulo Research Foundation (FAPESP).

niviana@usp.br