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ABC transporters mediated multidrug resistance in prostate cancer cells

Toluleke Famuyiwa, Joubin Jebelli, Elizabeth Ramirez, Allen Reilly, Christopher Pecille and Kumi-Diaka
Florida Atlantic University, USA

Background: Prostate cancer is the second most diagnosed cancer. This study focuses on overcoming ATP Binding Cassette (ABC)-mediated drug resistance in prostate cancer treatment.

The objective of study: This study aims to (i) investigate the interaction between 3-BPA and SC-514, (ii) reduce treatment-induced ABC-mediated Multidrug Resistance(MDR), and (iii) investigate the signaling pathways involved in ABC transporter-mediated MDR.

Method: We utilized Poly Lactic-co-Glycolic Acid (PLGA) nanoparticles as a co-delivery system for SC-514 and 3-Bromopyruvate (3-BPA) in LNCaP cells. The impact of varying concentrations of these drugs on LNCaP cells was studied. Bioassays used included Trypan Blue, MTT, and NBT. Fluorescence microscopy was performed.

Results: A One-way ANOVA was conducted to compare 3-BPA, SC-514, and the combination of 3-BPA and SC-514 after 24 hours of treatment. The result shows that the p-value= 0.00023. Regression analysis of the results from the time-dependent experiments was performed. The regression analysis showed the following p-values: 24hrs (0.00023), 48hrs (0.00003), 72hrs (0.000000152), 96hrs (0.000000049). ROS levels of LNCaP cells treated with 3-BPA ($r=-0.5$), SC-514 ($r=-0.72$) and 3-BPA + SC-514 ($r=-0.58$) were compared using one-way ANOVA. The result showed no significant difference in ROS modulation ($p=0.54$).

Conclusion: There is a weak to moderate correlation between ROS levels and cell death. Additionally, there was a positive correlation between the drug concentrations and cell death.

Biography

Toluleke Famuyiwa is the CEO of Solution Illuminators LLC and a John Maxwell Certified Coach, Trainer, and Speaker. He is certified as a competent communicator by Toastmasters International. He is mentoring undergraduate students in the USA and Nigeria. He does mastermind workshops, seminars, keynote speaking, and coaching. He holds a Master of Science Degree in Biology. He is currently a PhD student in Integrative Biology at Florida Atlantic University. He is an Adjunct Instructor at Broward College. He is a member of the following professional association: American Association for the Advancement of Science (AAAS); Health, Wellness & Society Research Network; American Society for Biochemistry and Molecular Biology (ASMB); Society for Integrative and Comparative Biology (SCIB); American Society of Clinical Oncology (ASCO); American Society for Pharmacology and Experimental Therapeutics (ASPET). He held numerous leadership positions; President of National Animal Science Students Association (NASSA) as an Undergraduate in Nigeria; C-BAC chairperson at Broward House of Representative, FAU; Assistant Director of Graduate and Professional Students' Association (GPSA). He is a recipient of outstanding student volunteer of the year; M- DOT award; Idiculla John Broward Student Employee Impact Award; numerous fellowships at FAU.

tfamuyiwa2014@fau.edu

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