

The use of styrene Maleic Acid nanomicelles encapsulating the synthetic cannabinoid analog WIN55,212-2 for the treatment of triple negative breast cancer

Khaled Greish ^a, Aanchal Mathur ^a, Reem Al Zahrani ^a, Sara Elkaissi ^a, Muna Al Jishi ^a, Osama Nazzal ^a, Safa Taha ^a, Valeria Pittalà ^b and Sebastien Taurin ^a



^aArabian Gulf University, Kingdom of Bahrain

^bCatania University, Italy

Abstract

Breast cancers are the most common cancers diagnosed in women. The therapeutic decision relies primarily on the level of expression of three protein biomarkers namely: estrogen receptor- α (ER- α), progesterone receptor (PR), and HER2. These biomarkers are essential determinants of breast cancer biology, have guided the therapeutic strategies, and predicted the response to systemic therapies.

Triple-negative breast cancers (TNBC), lacking the expression of these three biomarkers, continue to experience the highest mortality rate. Synthetic cannabinoid WIN55,212-2 (WIN) has shown promise as an anticancer agent but causes psychoactive side-effects.

In the present study, nano-micelles of styrene maleic acid (SMA)-conjugated WIN were synthesized to reduce side-effects and increase drug efficacy against triple negative breast cancer. Pharmacokinetics studies revealed the lower brain concentrations levels of WIN formulated Nano micelles, accompanied by almost 3 folds increase in its concentration levels in cancer tissues compared to free WIN. SMA-WIN formulation reduced tumor growth with milder psychoactive side effects when compared to the free drug. Moreover, low dosage of SMA-WIN, almost devoid of psychoactive side effects, in combination with an established chemotherapeutic agent achieved therapeutic efficacy and was sufficient to reduce the tumor volume of TNBC murine cancer model drastically

Adjunct Associate Professor of Pharmaceutical Chemistry at University of Utah, USA. He Published > 80 peer reviewed papers, and 10 book chapters in the field of targeted anticancer drug delivery. Controlled Release Society (CRS) awarded him the CRS Postdoctoral Achievement award in 2008 and in 2010; he was elected as member of the CRC College of Fellows.

Speaker Publications:

1. Screening and Molecular Docking of Novel Benzothiazole Derivatives as Potential Antimicrobial Agents; Antibiotics/Volume 9/Issue 5
2. New Arylethanolidazole Derivatives as HO-1 Inhibitors with Cytotoxicity against MCF-7 Breast Cancer Cells; International Journal of Molecular Sciences/Volume 21/Issue6
3. A multivariate statistical analysis of the effects of styrene maleic acid encapsulated RL71 in a xenograft model of triple negative breast cancer; Journal of Biological Methods/Volume 6/Issue4
4. Protective Effect of Spirulina platensis Extract against Dextran-Sulfate-Sodium-Induced Ulcerative Colitis in Rats; Nutrients/Volume 11/Issue 10
5. Subchronic and Chronic Toxicity Evaluation of Inorganic Nanoparticles for Delivery Applications; Advanced Drug Delivery Reviews/Voume 144

[19th Annual Congress on Pharmaceutics & Drug Delivery Systems](#) June 18-19, 2020 Webinar

Abstract Citation:

Khaled Greish, The Use of Styrene Maleic Acid Nanomicelles Encapsulating the Synthetic Cannabinoid Analog WIN55,212-2 for the Treatment of triple negative breast Cancer, Euro Pharmaceutics 2020, 19th Annual Congress on Pharmaceutics & Drug Delivery Systems June 18-19, 2020 Webinar.

<https://pharmaceutics.annualcongress.com/abstract/2020/the-use-of-styrene-maleic-acid-nanomicelles-encapsulating-the-synthetic-cannabinoid-analog-win55-212-2-for-the-treatment-of-triple-negative-breast-cancer>



Biography:

Khaled Greish is Associate Professor of Molecular Medicine, and head of the Nano-research unit, at Princes Al-Jawhara Centre, Arabian Gulf University, Kingdom of Bahrain, and