

Delivery of Oncolytic Viruses by Exploiting Mesenchymal Stem Cells: Tumor Regression, Resistance-Beating, and Metastases-Blocking

Rayan A. Ahmed



Jazan University Jazan, Saudi Arabia.

Abstract

The battle against cancer is not easy and that because cancer is not only one disease. Actually, it is a group of disorders comprising abnormal cell growth with the possibility to spread to different parts of the body. It is one of the main causes of death globally, and is liable for an expected 9.6 million deaths in 2018. Progress in drug development for cancer is the continuous efforts. However, undesirable toxicities and side effects are the key hurdles which prevent its success rate. Currently, various procedures have been carried out in the treatment of cancer including surgery, radiotherapy, chemotherapy, hormonal therapy, targeted therapy, as well as immunotherapy. Also, oncolytic virotherapy (OV) is another novel approach of cancer management which uses replicating viruses to kill abnormal cells, but systemic transportation and immunoreactions against the viruses stay challengeable.

Besides, mesenchymal stem cells (MSCs), which are a type of adult stem cells, have been recently introduced as an effective tool for cell-based therapy of multiple diseases, including cancer. With this aspect, MSCs are designed as cell vehicles equipped with anticancer drugs or viruses, not just on the grounds that they are easily acquired and multiplied to big numbers in-vitro, yet additionally due to their capacity to relocate and engraft into tumors. It also provides the protection to viruses from immune reactions inside the body. Furthermore, MSCs loaded with oncolytic viruses are used to treat advanced metastatic types of cancer. In facts, MSCs-intervened systemic transport of oncolytic viruses accomplished not just a synergistic anticancer activity with enhanced safety profiles, yet in addition the resistance of tumor cells is overwhelmed.

In brief, tremendous efforts of developing mesenchymal stem cells to deliver oncolytic viruses were done to set up a stage transforming advancement in oncolytic virus treatment to the hospitals.



Biography:

Rayan A. Ahmed is an assistant professor at Jazan University, Faculty of Pharmacy, Jazan, Saudi Arabia. He got his Ph.D degree from University of Louisiana at Monroe, Monroe, United States of America (2018). He focused his research work on understanding the molecular mechanisms of action of natural compounds in eradication of Epithelial-to-Mesenchymal Transition (EMT) associated with breast cancer (BC) metastasis and stemness. He is a member of many cancer association and societies worldwide.

Speaker Publications:

1. Ahmed RA, Alawin OA, Sylvester PW. γ -Tocotrienol reversal of epithelial-to-mesenchymal transition in human breast cancer cells is associated with inhibition of canonical Wnt signalling. *Cell Prolif.* 2016; 49(4):460-70. doi: 10.1111/cpr.12270. (Published).
2. Alawin OA, Ahmed RA, Ibrahim BA, Briski KP, Sylvester PW. Antiproliferative effects of γ -tocotrienol are associated with lipid raft disruption in HER2-positive human breast cancer cells. *J Nutr Biochem.* 2016; 27:266-77. (Published).

Beating, and Metastases- Blocking, Clinical Oncology 2020, 6th International Conference on Clinical and Medical Oncology; Webinar / Online Event- June 08-09, 2020 (<https://oncologistsconference.euroscicon.com/abstract-submission>).

3. Alawin OA, Ahmed RA, Dronamraju V, Briski KP, Sylvester PW. The Antitumor γ -Tocotrienol Incorporation in Lipid Raft is Associated with the Alteration of the Mitogenic Contents of Human Breast Cancer Cells Exosomes. J Nutr Biochem. 2016. (Published).

4. Alawin OA, Ahmed RA, Dronamraju V, Algayadh IG, Kalloub AA, Sylvester PW. Role of Endoplasmic Reticulum Stress in Mediating the Anticancer Effects of Tocotrienols In: Wagner C, editor. Endoplasmic Reticulum Stress: Regulation, Function and Role in Health and Disease. U.S: Nova Science Publishers 2016; 2016. P. 101-28. (Published).

5. Ahmed RA and Sylvester PW. γ -Tocotrienol Reversal of Epithelial-to-Mesenchymal Transition in Breast Cancer Cells is Mediated by Suppression of Hedgehog Signaling Pathway. 2018. (Submitted).

6. Ahmed RA, Sylvester PW. γ -Tocotrienol Reversal of Epithelial-to-Mesenchymal Transition in Human Breast Cancer Cells is Mediated Through a Suppression of Canonical Wnt and Hedgehog Signaling In: Vitamin E in Health and Disease. Intech open 2018. (Published).

7. Sohail Hussain, Saeed Alshahrani and Rayan A. Ahmed. Epigallocatechin-3-gallate attenuates aristolochic acid induced renal carcinoma in-vivo by oxidative stress, caspases and interleukins. 2019. (Submitted).

8. Sohail Hussain, Mohammad Ashafaq, Saeed Alshahrani, Rahimullah Siddiqui, Rayan A. Ahmed. The Cinnamon Oil Protects the Hepatotoxicity Induced by Acetaminophen in Male Rats. 2019. (Submitted).

9. Hafiz A. Makeen*1, Syam Mohan2, Mohamed Ahmed Al-Kasim3, Ibrahim M. Attafi4, Rayan A. Ahmed3, Nabeel K. Syed1, Muhammad Hadi Sultan5, Mohammed AlBratty6, Hassan A. Alhazmi2,6, Raisuddin Ali7, M. Intakhab Alam*5. Gefitinib loaded nanostructured lipid carriers: Characterization, evaluation and anti-human colon cancer activity in-vitro. 2020. (Submitted)

[6th International Conference on Clinical and Medical Oncology](#); Webinar / Online Event- June 08-09, 2020.

Abstract Citation:

Rayan A. Ahmed, Delivery of Oncolytic Viruses by Exploiting Mesenchymal Stem Cells: Tumor Regression, Resistance-