UNSATURATED 10H2DA QUEEN BEE ACID FROM ROYAL JELLY MODULATE EMT IN SW-480 COLORECTAL CANCER CELLS

Faculty of Science
University of Kragujevac

Institute of Information Technologies
University of Kragujevac

Milena M. Jovanović[1*], Dragana Šeklić[2]

[1] Faculty of Science, Department for biology and ecology, University of Kragujevac, Serbia
[2] Institute for Information Technologies Kragujevac, Department of Natural Sciences, University of Kragujevac, Serbia

* milena.jovanovic@pmf.kg.ac.rs

INTRODUCTION

Cancer research largely focuses on the epithelial to mesenchymal transition (EMT), as a critical mechanism required for the acquisition of the invasive potential of cancer cells that can culminate in the formation of metastases. This process involves the transformation of epithelial cells into mesenchymal cells by acquiring suppressed levels of E-cadherin, anti-EMT marker with role in establishment of intercellular junctions. Also, the expression of pro-EMT markers, regulatory SNAIL, as well as effectors N-cadherin and Vimentin, rises as cancer advances. Therefore, the emerging need arose for bioactive substances able to target and modulate EMT markers, and reverse this process.

Unsaturated fatty acid 10H2DA has not been investigated so far regarding its potential to target specific EMT markers in colorectal cancer (CRC), which was the aim of this study.

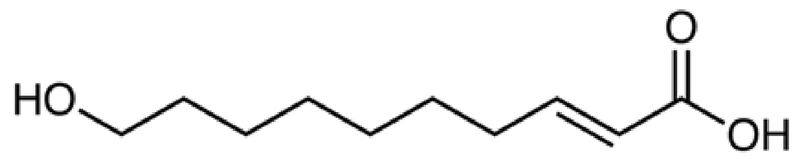

Figure 1. Structure of queen bee unsaturated fatty acid 10H2DA.

METHODS

Colorectal cancer cell line SW-480, isolated from stage II CRC was treated with 10H2DA in two selected concentrations - 10 and 100 μM. After 24 h, the gene expression of E-cadherin, SNAIL, N-cadherin and Vimentin markers was assessed by qPCR method. Additionally, the changes in protein concentration of these markers between control (untreated) and treated cells were evaluated by immunofluorescent assay.

RESULTS

Queen bee acid successfully upregulated the expression of anti-EMT marker *E-cadherin,* while our results point at downregulated expression of pro-EMT regulatory marker *SNAIL,* as well as effector markers *N-cadherin* and *Vimentin.*

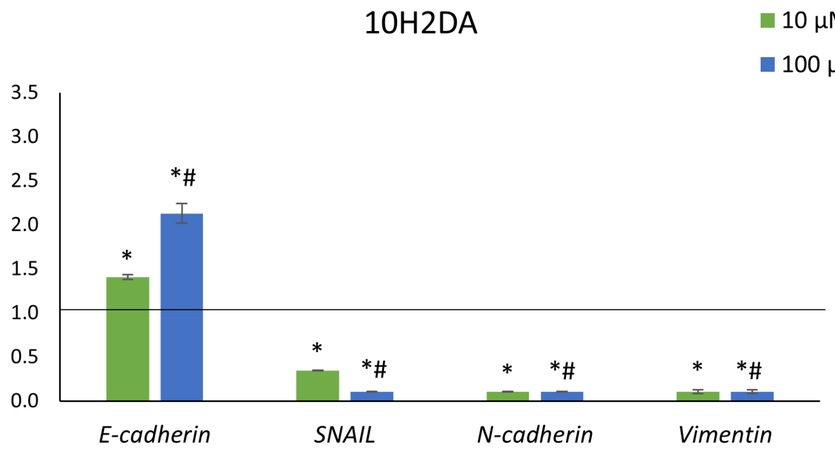

Figure 2. Effects of queen bee unsaturated fatty acid 10H2DA on gene expression of EMT markers in control and treated SW-480 cells. Results are presented as mean values ± standard error from three independent experiments; *p < 0.05 is considered as statistically significant difference between treatments and control values, and #p < 0.05 is considered as statistically significant difference between treatment concentrations.

This successively led to a significant elevation of E-cadherin on protein level, and also to an inhibition of pro-EMT proteins: SNAIL, N-cadherin and Vimentin.

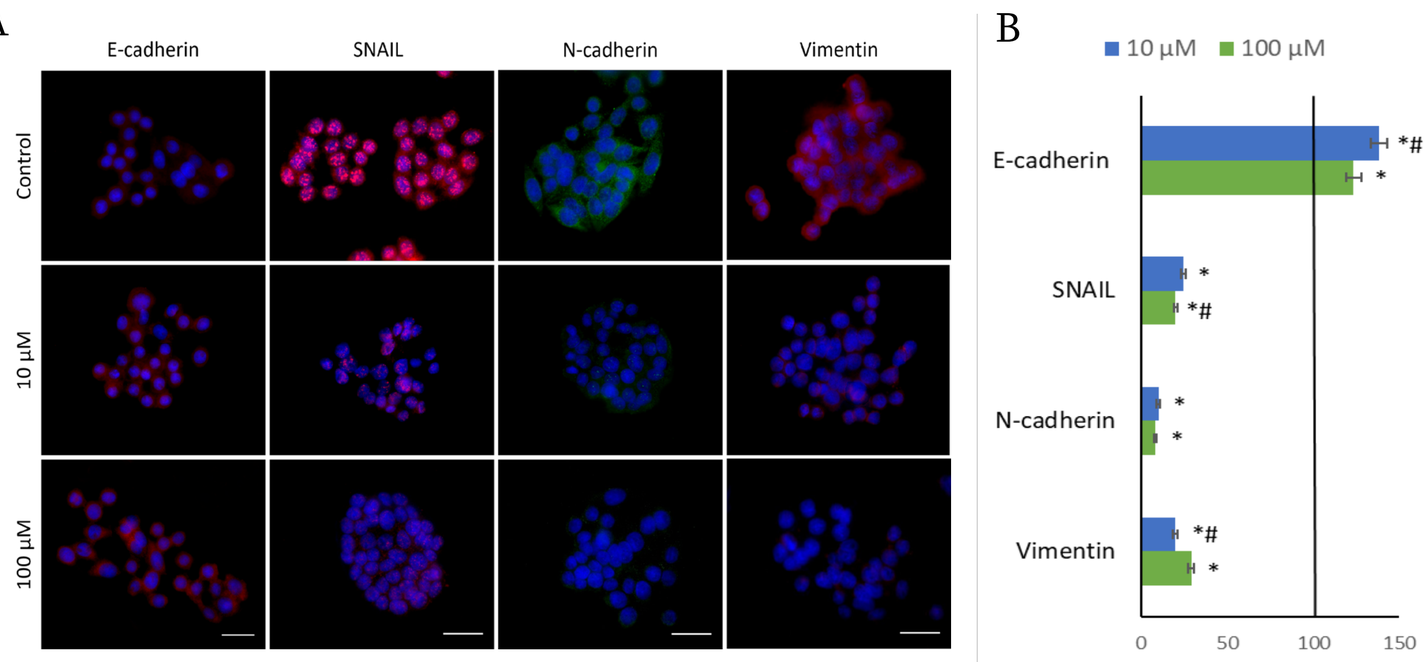

Figure 3. Representative micrographs showing EMT markers protein expression and localization (A), and relative fluorescence intensity (B) in untreated and SW-480 cells treated with 10H2DA. Results are presented as mean ± standard error from 2 independent experiments performed in triplicates, where *p<0.05 is considered as statistically significant difference between treatments and control values, and #p<0.05 is considered as statistically significant difference between treatment concentrations. Scale bar: 50 μm.

CONCLUSIONS

This prominent effects of unsaturated acid 10H2DA to modulate the expression of specific and significant EMT markers in CRC should not be neglected especially regarding new potential anticancer therapies.

ACKNOWLEDGEMENTS

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