UNIFood2021 Conference
24th-25th September 2021 University of Belgrade
2nd International UNIfood Conference

FOOD BIOACTIVES FIGHTING RENAL CANCER PROGRESSION

Íris Guerreiro[1], Nuno Saraiva[1], João Costa[1], Bojana Vidovic[2], Nuno G. Oliveira[3], Ana S. Fernandes[1] *

[1] CBIOS, Universidade Lusófona´s Research Center for Biosciences & Health Technologies, Lisbon, Portugal
[2] Department of Bromatology, Faculty of Pharmacy, University of Belgrade, Belgrade, Serbia
[3] Research Institute for Medicines (iMed.ULisboa), Faculty of Pharmacy, Universidade de Lisboa, Lisbon, Portugal

** Corresponding author: ana.fernandes@ulusofona.pt*

Many studies suggest a protective role of certain dietary patterns (e.g., consumption of cruciferous vegetables) against the risk of renal cancer. However, the current body of evidence is yet insufficient to establish a link between diet and the risk of renal cancer development and progression. Our work aims at contributing to fill this gap by dissecting the effects of two structurally distinct redox-active food components on kidney cell characteristics related to renal cancer progression. A special emphasis was given to cell motility due to its critical importance for the development of metastases. Thymoquinone is a monoterpene isolated from the oil of Nigella sativa seeds, which is widely used as a spice as well as in traditional medicine. We have shown that thymoquinone reduced the viability and promoted apoptosis of 786-O human renal cancer cells. At non-cytotoxic/genotoxic concentrations, thymoquinone significantly decreased the collective migration and the invasiveness potential of these cells. Erucin is an isothiocyanate that can be generated by *in vivo* reduction of sulforaphane or by enzymatic hydrolysis of glucoerucin. Contrarily to sulforaphane, limited studies have addressed the anticancer properties of erucin. Erucin induced a concentration-dependent decrease of cell viability, more pronounced in 786-O cancer cells than in the "normal-like" Vero-E6 cells. The exposure of cells to this bioactive led to an increase of the G2/M population. Collective cell migration, chemotaxis and chemoinvasion abilities, as well as cell adhesion, were impaired in erucin-treated cells. Additionally, erucin induced concentration-dependent changes on cell morphology and impaired tubulin polymerization. Overall, our results suggest that thymoquinone and erucin may have a beneficial impact in reducing renal cancer cells migration, contributing to explore the mechanisms of possible dietary approaches for chemoprevention.

Keywords: Renal cancer; thymoquinine; erucin; cell motility

Acknowledgements: Fundação para a Ciência e a Tecnologia (grants UIDB/04567/2020 and UIDP/04567/2020 to CBIOS, UIDB/04138/2020 and UIDP/04138/2020 to iMed.ULisboa and PhD grant 2020.07813.BD to IG); COST Action 16112–NutRedOx (STSM grant to B.V); U. Lusófona/ILIND (FIPID 2019/2020).