Flavonoids are polyphenolic compounds that occur in plants and are consumed in the form of fruits, vegetables and its derivates. Quercetin is one of the flavonoids with already well recognized multiple biological protective properties such as anti-inflammatory, anti-ulcer, anti-tumor, immunomodulatory and anti-oxidant. So, the aim of the present study was to assess the influence of quercetin on the modulation of ROS production through PKC/NADPH oxidase pathway in SK Hep-1 cells.

For ROS production, cells (5x10^5) were pre-incubated with quercetin in concentrations 10, 25 and 50 µM for 30 minutes and 6 hours. To analyze the influence of PKC, cells were incubated for 30 minutes with PMA (50 nM) and ionomycin (100 nM). Carboxy-H_2DCFDA (10 µM) was added to assess ROS production in all samples and incubated with PMA/Iono. Diphenyleneiodonium chloride (DPI) (20 µM), a NADPH oxidase inhibitor, was used as a negative control during the first incubation (30 min or 6 hours). After, cells were washed and fixed with a fixing solution. Fluorescence was monitored using a flow cytometer and data were analyzed with software FlowJo7.6.5. Data were analyzed by ANOVA, followed by the Bonferroni post test using Prism 5.0.

The results showed that cells stimulated with PMA/ionomycin (activators of PKC) showed significantly increased ROS production (approximately 100%), and this production returned to baseline levels after treatment with DPI. We did not observe any change in ROS production in SK Hep-1 cells treated with quercetin for 30 minutes and then stimulated with PMA/iono. However, quercetin modulated ROS production by PKC pathway at concentrations 25 and 50 µM (decrease 50% and 75% respectively) in 6 hours of incubation.

Our data suggests that quercetin can reduce the production of ROS through the signaling pathway of PKC / NADPH, but more studies are needed to confirm the effective participation of the compound in this pathway.

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