

## ABSTRACT

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Title of diploma thesis: Biological activity of antioxidant compounds in monocytes THP-1

Elaboration of this work is based on the experiments carried out in the Laboratory of Physiology at University Roma Tre in Rome, under the supervision of Prof. Sandra Incerpi. The team of this laboratory studies the antioxidants of different structures and evaluates their ability to prevent the production of reactive oxygen species (ROS). These reactive species are essential for many physiological processes, but they can also have deleterious effects and participate in the development of various diseases. In this work, I dealt with a study of antioxidant properties of different polyphenolic compounds (mosloflavone, negletein, 5,6-dihydroxyflavone, baicalein, gallic acid, and compound 1625) in the cell culture of human monocytes THP-1 and also in the *in vitro* test. Three different methods were used: intracellular ROS determination (dichlorofluorescein assay), cytotoxicity assay, and electron paramagnetic resonance spectroscopy (EPR). Mosloflavone showed scavenging ability neither in the cell culture nor during EPR. On the other hand, negletein possessed good scavenging ability in EPR but in the cell culture behaved as pro-oxidant at the concentration  $10^{-5}$  M. Baicalein and 5,6-dihydroxyflavone exerted significant ROS scavenging ability in all three assays. Gallic acid was able to inhibit ROS production only at higher concentrations ( $10^{-5}$ - $10^{-6}$  M), but due to its hydrophilic character is not capable of crossing the cell membrane. By contrast, its lipophilic derivative compound 1625, which proved to have comparable antioxidant ability as gallic acid, can cross the cell membrane and thus may serve as a transport form of gallic acid to the cells.