

ABSTRACT

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Title of diploma thesis: Biological activity of antioxidant compounds in L-6 myoblasts from rat skeletal muscles.

This work was 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 and oxidative stress. The reactive oxygen and nitrogen species play an important role as regulatory mediators of physiological responses. However, they can be also very harmful because they can damage DNA and proteins, cause peroxidation of lipids and injure other biomolecules. In my work, I tested the antioxidant effect of different polyphenols (baicalein, 5,6-dihydroxyflavone, negletein, mosloflavone, gallic acid and its derivative) in the cell culture (L-6 myoblasts from rat skeletal muscles) and in the *in vitro* test. The state of oxidative stress was induced by cumene hydroperoxide (generator of cumene hydroperoxide radical) and galvinoxyl. The methods used to evaluate the antioxidant activity were the cytotoxicity assay (MTT), fluorescence assay (DCFH-DA method) and electron paramagnetic resonance spectroscopy (EPR). Baicalein, 5,6-dihydroxyflavone and the synthetic ester of gallic acid (methyl-3,4,5-triacetoxybenzoate) showed the significant scavenging ability of free radicals at concentrations 10^{-5} - 10^{-7} M. Negletein showed prooxidative effect in the cells at concentration 10^{-5} M but in the *in vitro* test its scavenging ability was comparable with baicalein or 5,6-dihydroxyflavone. Mosloflavone did not show any scavenging ability at all. Gallic acid, because of its hydrophilic character, was not able to enter the cells and trap radicals. On the other hand, these compounds were able to inhibit the cell proliferation.