

# ABSTRACT

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*Title of diploma thesis:* Biological activity of potential antioxidants in L-6 rat myoblasts

This diploma thesis is based on the results of research conducted at the Department of Sciences, University of Roma Tre in Rome under the supervision of Professor Sandra Incerpi. Team of the Laboratory of physiology has been involved in the research of various natural substances with antioxidant and cytostatic properties for many years. Antioxidants are able to eliminate reactive oxygen species (ROS), which exert irreplaceable physiological effects in the body, but they are also a cause of certain diseases progression and aging due to the damage of various biomolecules. In this work, I studied the antioxidant activity of six synthetic derivatives of 4-methylcoumarin (AB-3, AB-4, AB-7, AB-8, AB-11, AB-12), which were synthesized and characterized by prof. Virinder Parmar (University of Delhi, India). Study was conducted in the L-6 rat myoblasts cell line (determination of intracellular ROS using dichlorofluorescein assay, cell proliferation assay) and in the cell-free environment (electron paramagnetic resonance spectroscopy, EPR). The strongest antioxidant was compound AB-7, which inhibited ROS formation in L-6 myoblasts by 75.9% at a concentration of  $10^{-5}$  M. This compound possessed the strongest anti-proliferative properties and proved to be the strongest antioxidant in EPR test. Good antioxidant properties showed also compounds AB-3 and AB-11, while compounds AB-4, AB-8 and AB-12 proved to be pro-oxidants. Antioxidant activity of 4-methylcoumarin derivatives was dependent on the presence of two adjacent hydroxyl groups on the benzene ring.