Synthesis and electrochemical and biological studies of novel coumarin-chalcone hybrid compounds

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A series of novel hydroxy-coumarin-chalcone hybrid compounds 2a-i has been synthesized by employing a simple and efficient methodology. An electrochemical characterization using cyclic voltammetry and ESR spectroscopy were carried out to characterize the oxidation mechanism for the target compounds. The antioxidant capacity and reactivity were determined by ORAC and ESR assays, respectively. Biological assays were assessed to evaluate the cytotoxicity and cytoprotection capacity against ROS/RNS on BAEC. The results revealed that all tested compounds present ORAC values that are much higher than other well-known antioxidant compounds such as quercetin and catechin. Compound 2e showed the highest ORAC value (14.1) and also presented a low oxidation potential, good scavenging capacity against hydroxyl radicals, low cytotoxicity, and high cytoprotective activity.