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Biomimetic oxidized resveratrol metabolite mixtures

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There is an increasing interest in the chemical space of the metabolites that may be formed from an antioxidant upon scavenging reactive oxygen or nitrogen species (ROS/RNS) [1]. Resveratrol, a well-known natural plant polyphenol with a plethora of pharmacological activities most notably its antioxidant properties [2], can efficiently scavenge various types of ROS/RNS, resulting in several radical intermediates whose chemical stabilization may lead to various bioactive compounds [3].
Our current studies aimed at evaluating some potential pharmacological implications of resveratrol oxidation. Oxidation through various chemical reactions, including biomimetic approaches, resulted in several mixtures that exhibited greater bioactivities compared to the parent compound. Mixtures were tested for their *in vitro* antioxidant activities (DPPH, ORAC), and inhibitory action on cyclooxygenase 1 and 2, lipoxygenase, xanthine oxidase, and angiotensin converting enzyme.
Using a multi-step chromatographic isolation procedure and spectral analysis, a diverse group of compounds including dimers, chlorine-, iodine-, ethoxy- and benzofuran derivatives were obtained in pure form. Evidently, the final oxidation products and the stability of the intermediate species resulting from the oxidative reactions vary depending on the surroundings as well as the nature of oxidative process.
While all groups of metabolites showed enhanced activity in inhibiting angiotensin converting enzyme, the dimers exhibited the greatest inhibitory activity on lipoxygenase enzyme, with chlorine- and iodine-substituted compounds exhibiting greatest antioxidant activities and xanthine oxidase inhibition.

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