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Oxidation of Quercetin by Salivary Components II. Effects of Quercetin on Reactive Oxygen Metabolism by Salivary Polymorphonuclear Leukocytes

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Salivary polymorphonuclear leukocytes (SPMN) produce O_2^- and H_2O_2 reducing molecular oxygen, and quercetin is a phenolic compound found in vegetables and fruits. The aim of the present study was to elucidate the interaction between SPMN and quercetin. The oxygen consumption by SPMN, which was stimulated by phorbol myristate acetate (PMA), was suppressed by quercetin. Half-inhibition was observed at about 20 μM quercetin. During inhibition of the oxygen uptake, quercetin was oxidized; the oxidation was inhibited by superoxide dismutase and enhanced by horseradish peroxidase. Quercetin was taken up into SPMN and myeloperoxidase in SPMN could oxidize quercetin if H_2O_2 was provided. These results indicate that quercetin can inhibit the formation of O_2^- and H_2O_2 by PMA-stimulated SPMN and that the flavonol can scavenge O_2^- and H_2O_2 generated by the SPMN. Quercetin inhibited the growth of *Porphyromonas gingivalis* that might cause periodontal disease. According to the above results, quercetin seems able to suppress SPMN-dependent inflammation caused by reactive oxygen species inhibiting the growth of bacteria in the mouth.

Keywords: [oxygen metabolism](#), [quercetin](#), [salivary polymorphonuclear leukocyte](#), [scavenging of reactive oxygen species](#)

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