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Anti-oxidative Cu₂(aspirin)₄ complex: in vitro and in vivo anti-oxidative activities, and absorption of copper

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Abstract:

Since it is proposed that reactive oxygen species (ROS) is involved in the pathogenesis of various diseases, low-molecular weight superoxide dismutase (SOD) mimetic complexes have been intensively studied. We prepared a Cu₂(aspirin)₄ complex consisting of Cu(II), active center of Cu, Zn-SOD, and aspirin, which has been in use for many years as an antipyretic, an analgesic, and as an anti-inflammatory agent. The ROS scavenging activities of Cu₂(aspirin)₄ and Cu(salicylic acid)₂, for comparison, have been evaluated in in vitro and in vivo. We have ever proposed that Cu₂(aspirin)₄ has SOD mimetic activity and defense activity against skin injury caused by an ultraviolet radiation. The suppressive effect of ROS generation following UVA irradiation on the skin of hairless mice, who received oral administration of the complexes for three consecutive days, was observed, the effect being significantly higher than that of Cu(II) ion. Further, the Cu concentration in the skin and blood of ICR mice who received complexes were measured using atomic absorption spectrometry. The Cu concentration in the skin of ICR mice treated with Cu₂(aspirin)₄ was slightly increased, probably due to lipophilicity of Cu₂(aspirin)₄ complex. The Cu₂(aspirin)₄ complex was thus observed to be an orally active anti-oxidative complex, proposing a potent anti-oxidative agent for clinical use in future to treat diseases relevant to ROS.

Key words: [Cu₂\(aspirin\)₄](#), [Cu\(salicylic acid\)₂](#), [reactive oxygen scavenging activity](#), [SOD mimics](#), [UV exposure](#), [skin](#)

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