

A Fungal Cu/Zn-Containing Superoxide Dismutase Enhances the Therapeutic Efficacy of a Plant Polyphenol Extract in Experimental Influenza Virus Infection

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The combined protective effect of a polyphenol-rich extract, isolated from *Geranium sanguineum* L. (PC), and a novel naturally glycosylated Cu/Zn-containing superoxide dismutase, produced from the fungal strain *Humicola lutea* 103 (HL-SOD), in the experimental influenza A virus infection (EIVI) in mice, induced with the virus A/Aichi/2/68 (H3N2), was investigated.

The combined application of HL-SOD and PC in doses, which by themselves do not defend significantly mice in EIVI, resulted in a synergistically increased protection, determined on the basis of protective indices and amelioration of lung injury. Lung weights and consolidation as well as infectious lung virus titers were all decreased significantly parallel to the reduction of the mortality rates; lung indices were raised. The excessive production of reactive oxygen species (ROS) by alveolar macrophages (aMØ) as well as the elevated levels of the lung antioxidant enzymes superoxide dismutase (SOD) and catalase (CAT), induced by EIVI, were brought to normal. For comparative reasons the combined protective effect of PC and vitamin C was investigated. The obtained results support the combined use of antioxidants for the treatment of influenza virus infection and in general indicate the beneficial protective role of combinations of viral inhibitors of natural origin with diverse modes of action.

Key words: Plant Polyphenol Extract, Fungal Cu/Zn-Containing SOD, Influenza Virus Infection