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Rehmannia glutinosa increase the antioxidant enzyme activities in HEI-OC1 cells

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A mechanism of hair cell damage caused by noise and ototoxic agents is mediated through generation of free radicals and reactive oxygen species (ROS). It is known that most of animals have defense systems of ROS that protect against ROS, and the cochlea of animals also has ROS defense system, which appear efficient in detoxifying ROS generated under normal condition. This system includes several antioxidant enzymes such as superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPX), and glutathione reductase (GR). Steamed roots of Rehmannia glutinosa have been used in Oriental traditional medicine for treatment of auditory disease such as tinnitus and hearing loss and to treat inflammatory diseases, hectic fever, night sweat, headache and dizziness. In the present study, we showed that the ethanol extract of steamed roots of R. glutinosa (SRG) increased the antioxidant enzymes such as SOD, CAT, GPX, and GR in mouse auditory hair cell (HEI-OC1 cell) damage. In cytotoxicity test, 0, 5, 10, and 50 μg/ml of SRG did not show the significant cytotoxicity. SRG gave positive tests for phenolics, flavonoids, glycosides, peptides, steroids and organic acids. Our results further support the view that SRG is promising sources of potential antioxidants. Future studies will be aimed at investigating the effects of SRG on the regulation of cellular mechanisms and upon isolating and identifying the substances responsible for the antioxidant enzyme system effects of the plant extracts. This work was supported by the Korea Science & Engineering Foundation (KOSEF) through the Vestibulocochlear Research Center (VCRC) at Wonkwang University (R13-2002-055-01003-0).