

Antioxidant Effects of *Scutellaria baicalensis* Georgi Against Hydrogen Peroxide-induced DNA Damage and Apoptosis in HaCaT Human Skin Keratinocytes

Seung Young Lee, Hyun Mi Jin, Byung-Gon Ryu, Ji Young Jung, Hye Kyeong Kang, Hee Won Choi, Kyung Min Choi and Jin Woo Jeong*

Freshwater Bioresources Utilization Bureau, Nakdonggang National Institute of Biological Resources, Sangju 37242, Korea

In this study, we investigated whether *S. baicalensis* rhizome ethanol extract (SBRE) has antioxidant capacities against oxidative stress induced cellular damage in the HaCaT keratinocytes. Our results revealed that treatment with SBRE prior to hydrogen peroxide (H₂O₂) exposure significantly increased the HaCaT cell viability. SBRE also effectively attenuated H₂O₂ induced comet tail formation, and inhibited the H₂O₂ induced phosphorylation levels of the histone γ H2AX, as well as the number of apoptotic bodies and Annexin V positive cells. In addition, SBRE exhibited scavenging activity against intracellular ROS generation and restored the mitochondria membrane potential loss induced by H₂O₂. Moreover, H₂O₂ enhanced the cleavage of caspase-3 and degradation of poly (ADP-ribose)-polymerase as well as DNA fragmentation; however, these events were almost totally reversed by pretreatment with SBRE. Furthermore, SBRE increased the levels of HO-1 associated with the induction of Nrf2. Therefore, we believed that SBRE may potentially serve as an agent for the treatment and prevention of neurodegenerative diseases caused by oxidative stress.

Key words: *Scutellaria baicalensis* Georgi, Antioxidant, ROS, DNA damage, Apoptosis, Nrf2/HO-1

[This research was supported by the Basic Science Research Program through the National Research Foundation of Korea (NRF) grant funded by the Korea government (No. 2016R1C1B1014724).]

[This work was supported by the Nakdongnag National Institute of Biological Resources grant funded by the Ministry of Environment, Republic of Korea.]