

Anti-tyrosinase and Antioxidant Activities of GINOS : A Novel Ginseng Mixture

Zelika Mega Ramadhania¹⁾, Huo Yue¹⁾, Ramya Mathiyalagan¹⁾, Jong Chan Ahn¹⁾, Jin Kyu Park¹⁾, Feng Jiao Xu¹⁾, Dong Uk Yang²⁾ Dong Wook Lee²⁾, Deok Chun Yang^{1),2)*}



¹ Graduate School of Biotechnology, College of Life Sciences, Kyung Hee University, Yongin, 17104, Republic of Korea.
² Department of Oriental Medicinal Biotechnology, College of Life Sciences, Kyung Hee University, Yongin, 17104, Republic of Korea.
*Email : dcyang@khu.ac.kr

Abstract

Background: Ginseng possess many therapeutic and cosmeceutical properties because of their abundant bioactive compounds, especially their saponin compounds, ginsenosides. In the present study, the various ginsengs (white ginseng, red ginseng, black ginseng, fermented red ginseng, Taegeuk ginseng, and cultured root mountain ginseng (CRMG)) were mixed with an equivalent ratio, namely GINOS, to improve its benefit as human health and beauty products ingredient. Hence, we determined the anti-tyrosinase and antioxidant activities of GINOS to check its potential as a skin-whitening agent.

Methods and Results: The results showed dose-dependent inhibitory activity of GINOS towards mushroom tyrosinase and intracellular tyrosinase on B16F10 cells. Tyrosinase activity of GINOS-treated cells at 125, 250, and 500 µg/mL concentration was reduced by 23.6%, 39.6%, and 49.5% compared with IBMX-stimulated cells, respectively. GINOS reduced 35% free radical scavenging and increased the reducing power activity at 10 mg/mL concentration. We also evaluated intracellular Reactive Oxygen Species (ROS) production in H₂O₂-induced oxidative stress-treated on HaCaT cells, it showed GINOS at 1000 µg/mL reduced 35% of ROS level. Furthermore, GINOS did not show toxicity effect at the concentration tested in B16F10, HaCat and Human Dermal Fibroblast (HDF).

Conclusion: These results suggest that GINOS might be a good potential source of anti-tyrosinase and antioxidants for application in cosmeceutical products.

Results

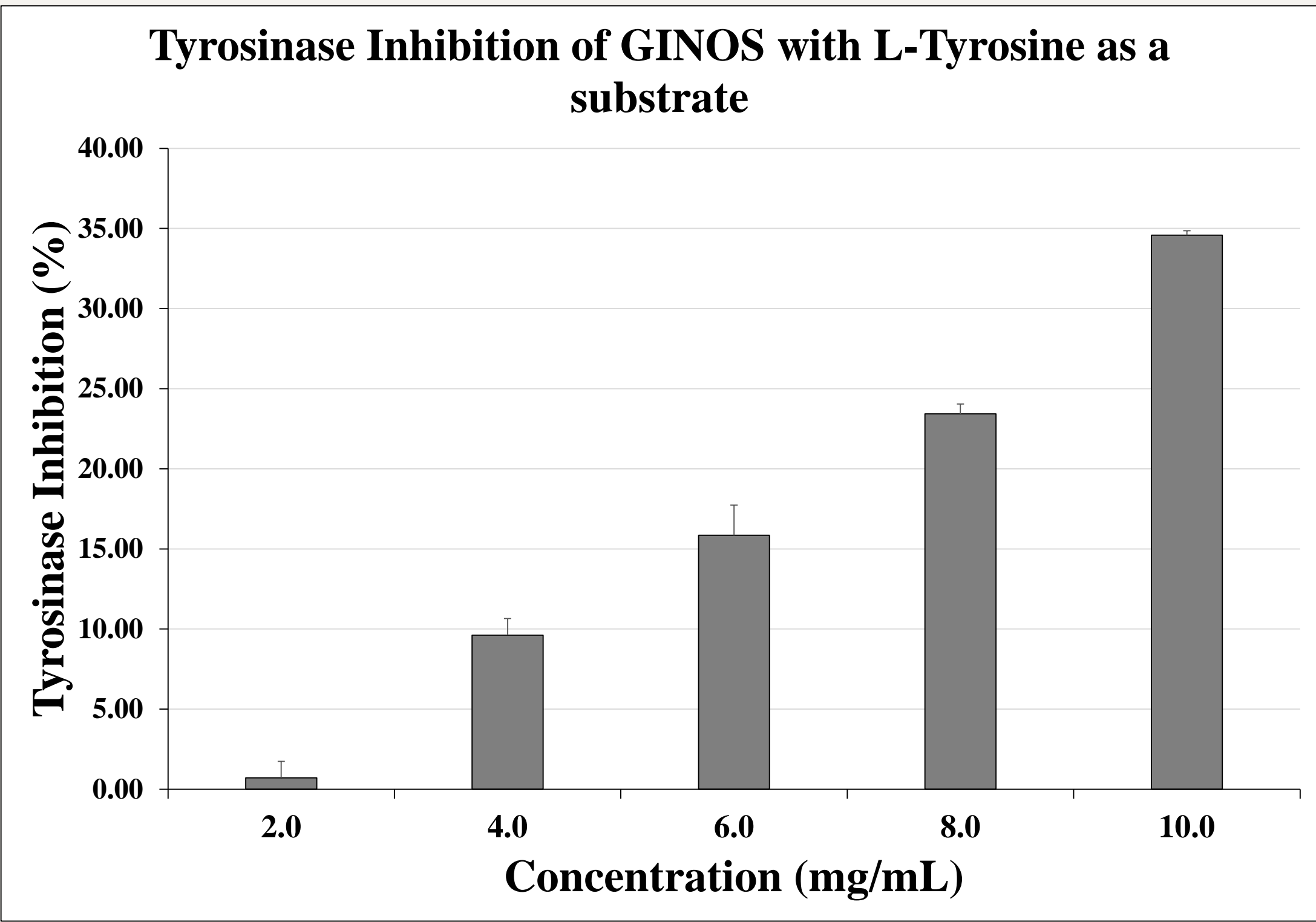


Fig 1. Mushroom Tyrosinase Activity

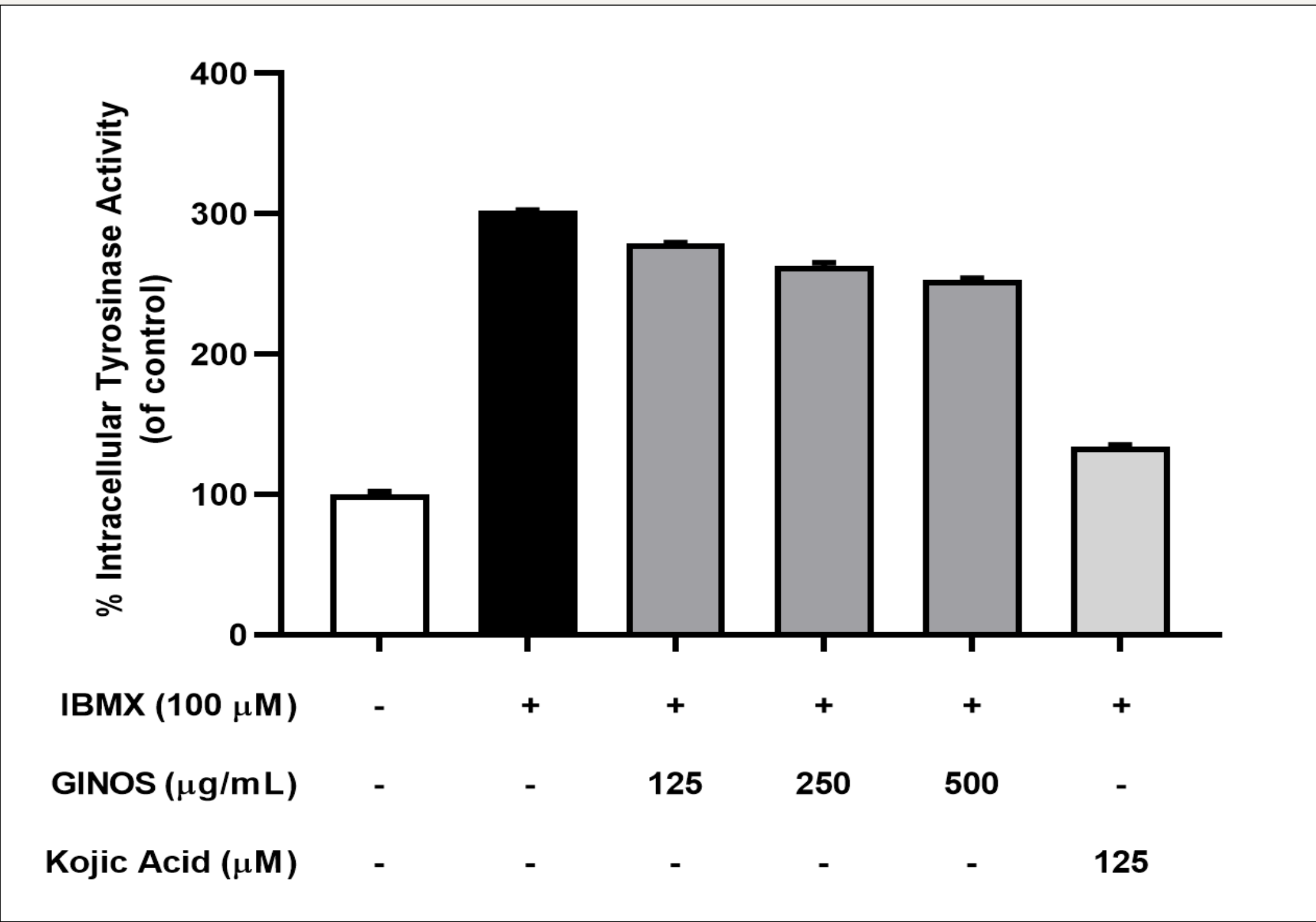


Fig 2. Intracellular Tyrosinase Activity

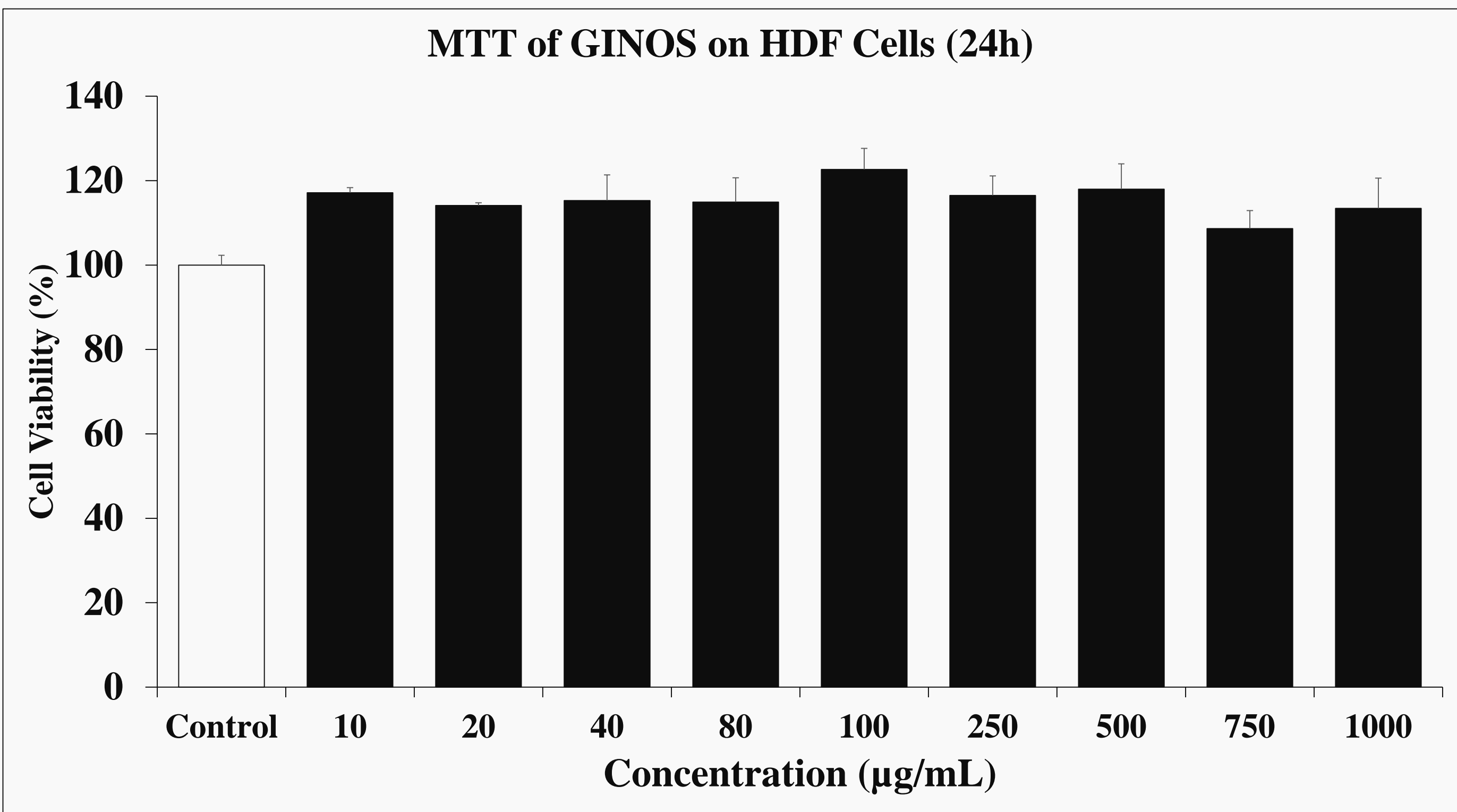


Fig 6. Cell Viability of GINOS on B16F10 Cells

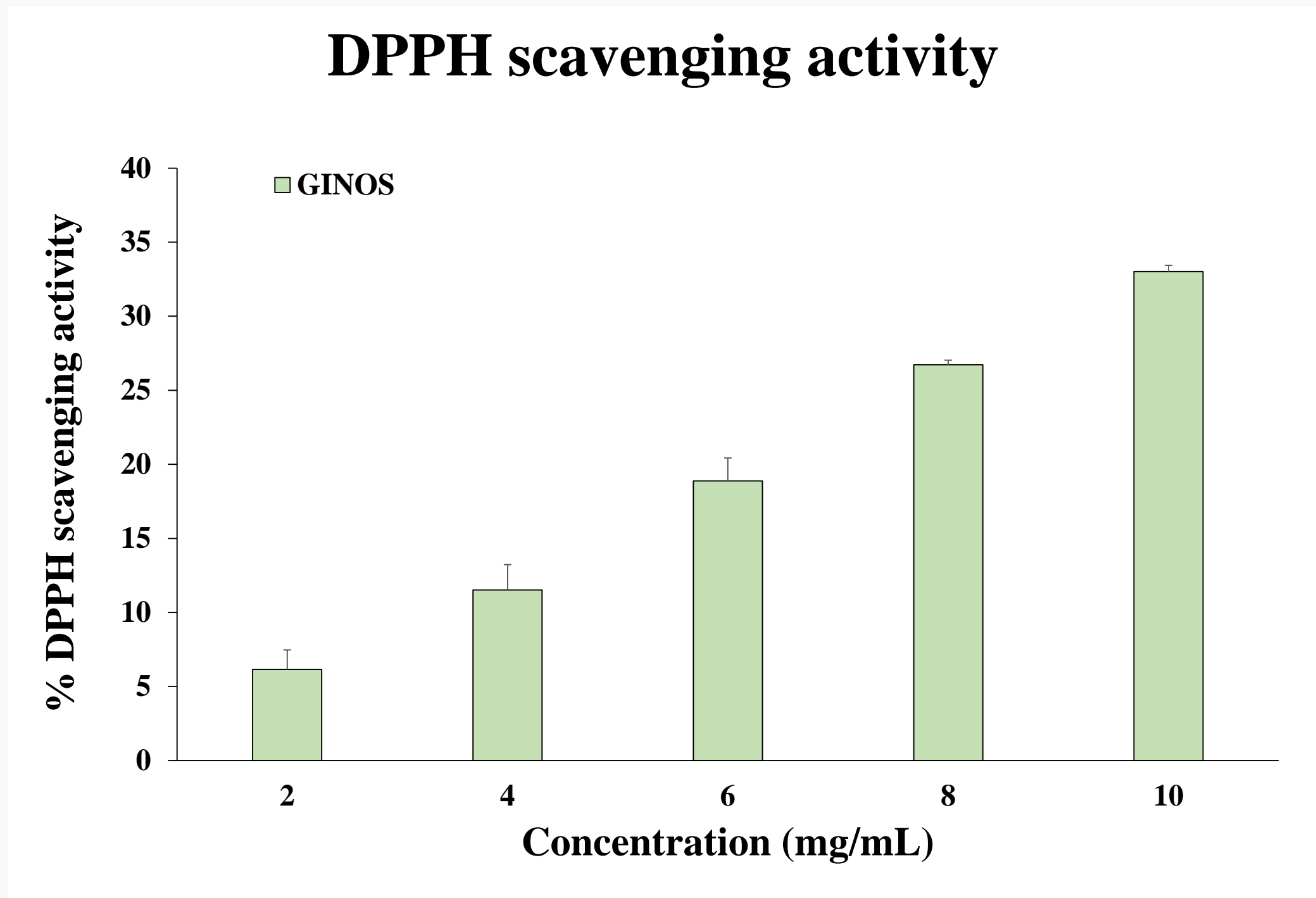


Fig 3. DPPH Scavenging Activity

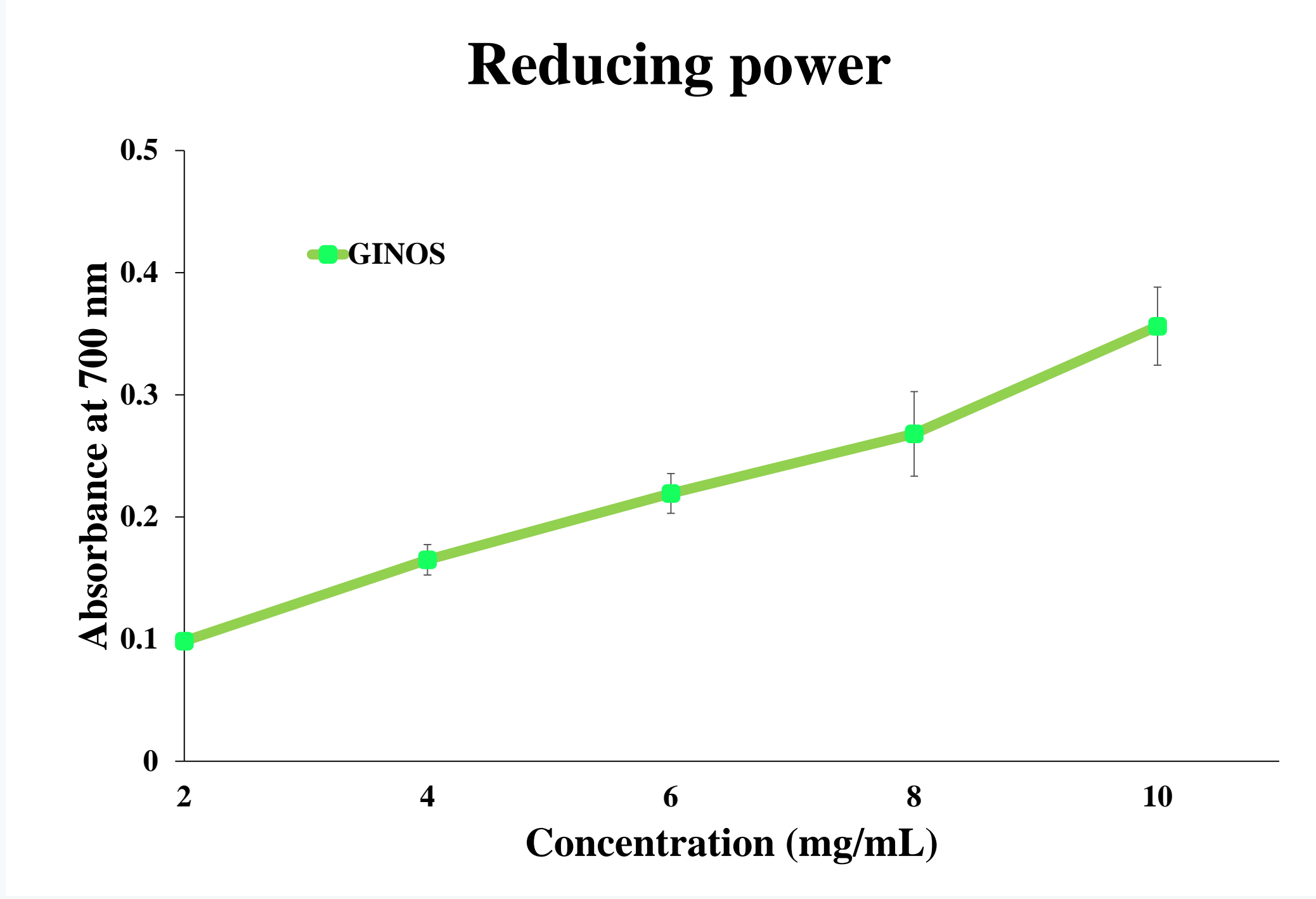


Fig 4. Reducing Power Activity

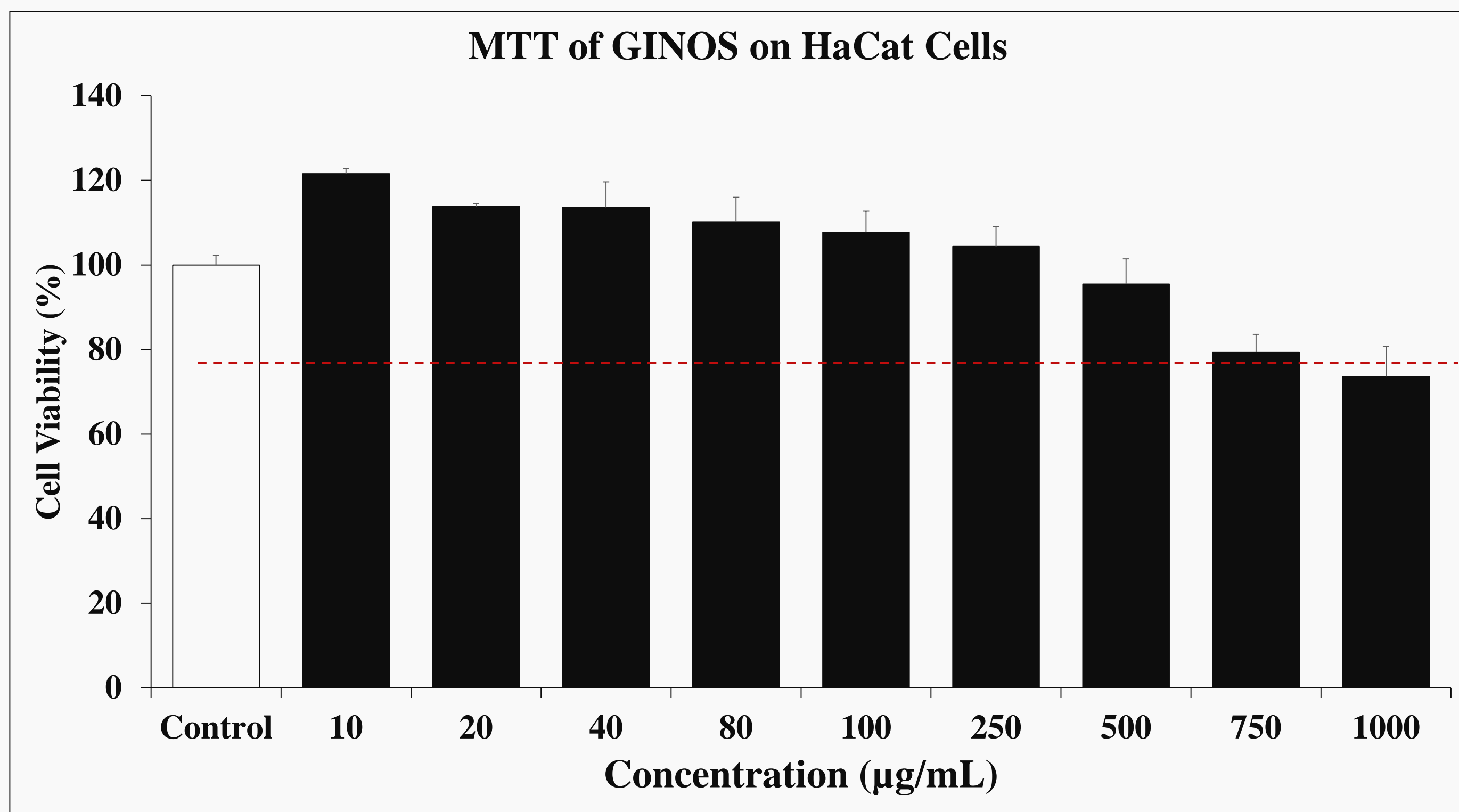


Fig 7. Cell Viability of GINOS on HaCat Cells

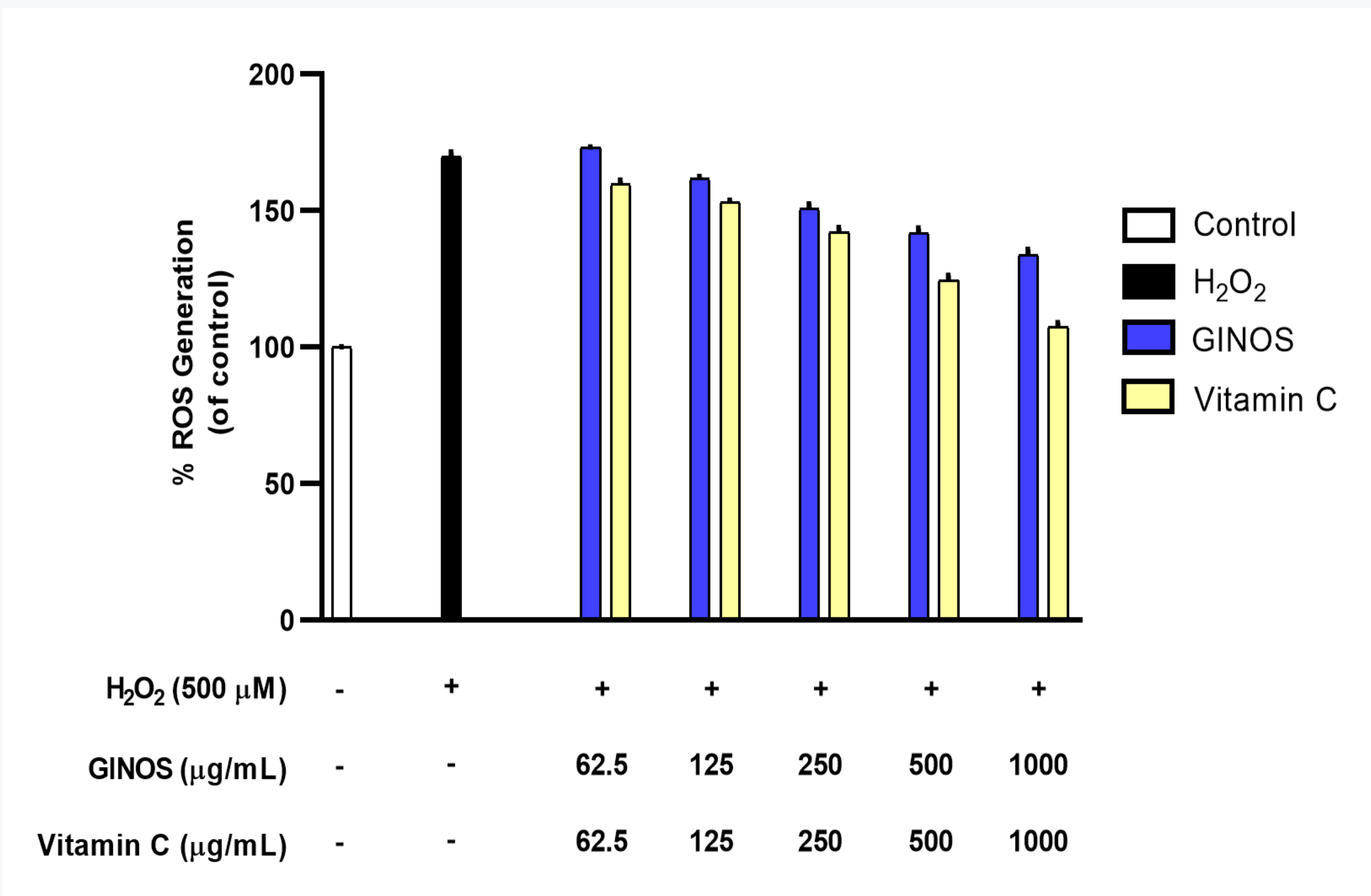


Fig 5. ROS Generation

Conclusion

GINOS is a novel ginseng mixture consisting of white ginseng, red ginseng, black ginseng, fermented red ginseng, Taegeuk ginseng, and cultured root mountain ginseng (CRMG) with an equivalent ratio, showed a good anti-tyrosine and antioxidant activities. Moreover, GINOS did not show a toxicity effect at the concentration tested in B16F10, HaCat, and Human Dermal Fibroblast (HDF). These results suggest that GINOS might be a good potential source of anti-tyrosinase and antioxidants for application in skin-whitening products.

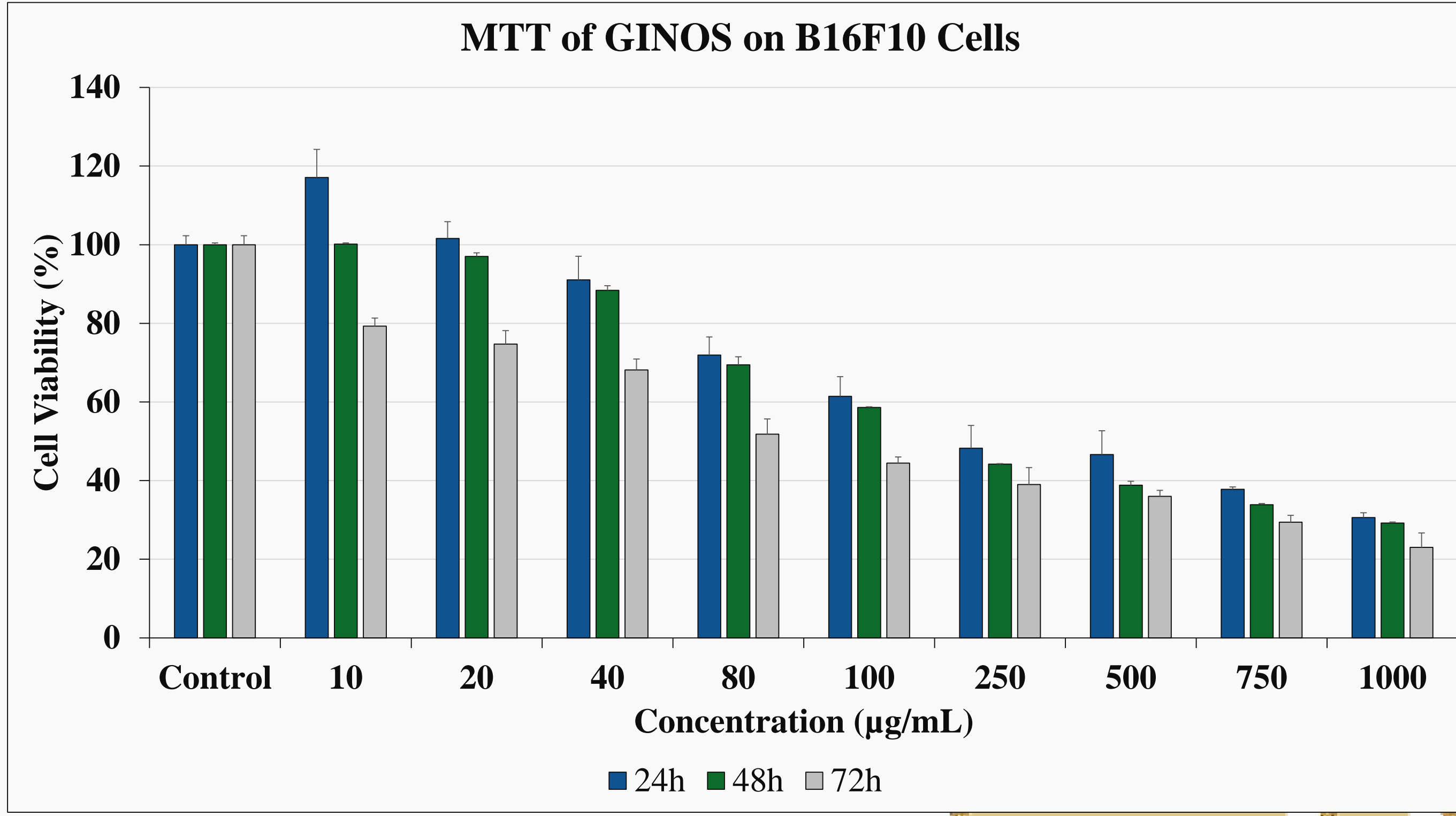


Fig 8. Cell Viability of GINOS on HDF Cells

Acknowledgement
This work was supported by Korea Institute of Planning and Evaluation for Technology in Food, Agriculture and Forestry (IPET) through Agri-Food Export Business Model Development Program, funded by Ministry of Agriculture, Food and Rural Affairs (MAFRA) (Project No: 320104-03) and the study was also supported by a grant from The National Research Foundation of Korea (NRF) (Project no: NRF- 2020R11A1A101070867), Republic of Korea.

