

Effect of extremely low frequency electromagnetic field on melanogenesis with B16F10 melanoma

서영권[†], 김유미, 박정극¹
동국대학교 의생명공학과; ¹동국대학교
(bioseo@dongguk.edu[†])

Melanin is naturally synthesized pigment, which determines the color of skin, hair, and eyes of living things. The natural tanning process occurs as a response to exposure to UV radiation. However, UV-induced tanning can cause damage of DNA and other cellular molecules, leading to mutagenesis, carcinogenesis and photo-aging. Here, we stimulated the melanogenesis in B16F10 melanoma cells by using specific frequency of ELF-EMFs. In this study, we focused on the melanogenesis of EMF-ELFs and found that 60Hz~75Hz of ELF-EMFs upregulates melanin synthesis by stimulated expression of tyrosinase and TRP-1 through inhibition of phosphorylation ERK, activation of CREB and MITF up-regulation in B16F10 melanoma cells. Results showed that 60~75Hz ELF-EMFs significantly increased secreted melanin, cellular melanin content and tyrosinase activity and the cell mitochondria activity and cell viability was unchanged. Furthermore, protein expression level of MITF and p-CREB signaling pathway were significantly increased. Moreover, 60Hz ELF-EMFs reduces phosphorylate of ERK in B16F10 melanoma cells. These finding provide stimulation of melanogenesis by using ELF-EMFs has therapeutic potential for treating hypopigmentation disorders such as vitiligo.