



Assessment of 5G Wireless Radiation Effects on Skin Cells

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Radiofrequency (RF) radiation is a form of electromagnetic radiation that has been used in various applications. Concerns have been raised regarding the potential harmful effects of radio waves frequency radiation on skin cells. Previous studies have indicated that RF radiation induce genotoxic effects on skin cells, potentially leading to DNA damage and other cellular changes. Present study is aimed to investigate the impact of 5G mobile phone radiation on skin cells using *in vitro* cellular models. Human primary skin cells and cancerous mouse skin cells were exposed to 5G mobile phone radiation at specific frequencies and power levels using specifically designed exposure chamber. The Specific Absorption Rate (SAR) and power density were carefully monitored and controlled during the exposure. Cellular responses were assessed through various assays, including cell viability, proliferation, apoptosis, and oxidative stress markers. Our study suggests that 5G mobile phone radiation elicit significant cellular responses in skin cells, including reduced cell viability demonstrated by MTT assay, altered proliferation rates, increased apoptosis identified by Hoechst staining, and oxidative stress. A significant DNA damage, as evidenced by the comet assay was observed. Additionally, an increase in ROS (reactive oxygen species) generation was observed using DCFDA (2',7' -dichlorofluorescein diacetate) staining, indicating oxidative stress induced by radiation. Furthermore, apoptosis detection by Annexin V PI double staining revealed elevated levels of apoptotic cells following radiation exposure.

1. Kim, K., Lee, Y. S., Kim, N., Choi, H. D., Kang, D. J., Kim, H. R., & Lim, K. M. (2020). Effects of Electromagnetic Waves with LTE and 5G Bandwidth on the Skin Pigmentation In Vitro. *International journal of molecular sciences*, 22(1), 170. <https://doi.org/10.3390/ijms22010170>.
- 2 Kim, K., Lee, Y. S., Kim, N., Choi, H. D., & Lim, K. M. (2022). 5G Electromagnetic Radiation Attenuates Skin Melanogenesis In Vitro by Suppressing ROS Generation. *Antioxidants (Basel, Switzerland)*, 11(8), 1449. <https://doi.org/10.3390/antiox11081449>.