

Protective Effect of Polysaccharides from Plants toward UVB in HaCaT Cell

張瑜珊(5123)

2023/10/25

Outline

1. Introduction
2. Protective effect of polysaccharide from *Sophora japonica* L. flower buds against UVB radiation in a human keratinocyte cell line (HaCaT cell)
3. Photoprotective activities of *Lignosus rhinoceros* in UV-irradiated human keratinocytes
4. Conclusion

Abstract

Ultraviolet (UV) radiation is classified into three distinct types, notably UVA, UVB, and UVC, which are differentiated based on their respective wavelengths. UVB radiation significantly impacts human skin, as prolonged exposure can damage keratinocytes, leading to cellular apoptosis. Various methods can be employed to prevent skin damage, including physical protection, chemical solution, and dietary measures. Dietary choices can be effective by incorporating foods rich in antioxidants and anti-inflammatory properties. Due to their high antioxidant and capabilities, this study focuses on traditional Chinese medicinal plants, namely locust tree flower buds and tiger milk mushrooms (TMM). The flower buds of the locust tree (*Sophora japonica* L.) are known to contain flavonoids, polysaccharides, and alkaloids. On the other hand, the core (sclerotium) of the tiger milk mushroom (TM02) has been found to possess notable medicinal effects, characterized by strong antioxidant and anti-inflammatory properties. These characteristics have led to the selecting of these two subjects for the present research study. Research about *Sophora japonica* L. flower buds (PS) suggest inhibiting the pro-apoptotic factor Caspase 3 can reduce cellular apoptosis. Ther research about tiger milk mushrooms further supports this by highlighting the inhibition of Caspase 3 and additional pro-apoptotic factor, BAX, while promoting the expression of anti-apoptotic factors, BCL-XL and BCL-2. At a concentration of 1.0 mg/mL PS, a reduction in reactive oxygen species production following UV exposure is observed, along with the suppression of Caspase 3 expression, leading to a decrease in cellular apoptosis. Additionally, 125 µg/mL TM02-ME inhibits Caspase 3 and BAX expression while enhancing the expression of BCL-XL and BCL-2, effectively suppressing BAX expression. These finding demonstrate that PS and TM02-ME offer protection from UV in the skin by inhibiting Caspase 3 expression.

References

- 1 Ding, Hui., Dou, Yanli., Huang, Tao., Lan, Chong., Li, Liyan., & Yan, Chunsheng. (2019).
2 Protective effect of polysaccharide from *Sophora japonica* L. flower buds against UVB
3 radiation in a human keratinocyte cell line (HaCaT cells). *Journal of photochemistry &*
4 *Photobiology, B: Biology*, 191, 135-142.
- 5 Lim, H.S., Kuan, O.T., Saidur, R., Samson, E.S., & Yow, Y.Y. (2022). Photoprotective
6 Activities of *Lignosus rhinoceros* in UV-irradiated human keratinocytes. *Journal of*
7 *Ethnopharmacology*, 299, 115621.