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Polygonum viscoferum extract protects human skin fibroblasts against UVB-induced photoaging by inhibiting the expression of MMPs

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Exposure to ultraviolet (UV) light can cause skin photoaging, which is associated with upregulation of matrix metalloproteinases (MMPs) and downregulation of collagen synthesis. It has been reported that MMPs, especially MMP-1, MMP-3 and MMP-9, decrease the elasticity of the dermis by degrading collagen. In this study, we assessed the effects of *Polygonum viscoferum* extract (PVE) on photoaging and investigated its mechanism of action in human skin fibroblast (Hs68) cells after UVB exposure using real time polymerase chain reaction, Western blot analysis and enzymatic activity assays. PVE exhibited an antioxidant activity and inhibited elastase activities *in vitro*. We also found that PVE inhibited UVB-induced cytotoxicity, MMP-1 production and expression of MMP-1, 3 and 9 mRNA in Hs68 cells. In addition, PVE decreased UVB-induced MMP-2 activity and MMP-2 mRNA expression. These effects are linked to the upregulation and downregulation of Smad3 and Smad7, respectively. Another effect of UV irradiation is to stimulate activator protein 1 (AP-1) activity via overexpression of *c-Jun/c-Fos*, which in turn, upregulates MMP-1, 3 and 9. In this study, we found that PVE suppressed UV-induced *c-Jun* and *c-Fos* mRNA expression. Taken together, these results demonstrate that PVE regulates UVB-induced expression of MMPs by inhibiting AP-1 activity and restoring impaired Smad signaling, suggesting that PVE may be useful as an effective anti-photoaging agent.

Biography

Nari Kim has completed her MS at Departure of Dermatology from Chungnam National University School of Medicine. She has worked at COSMAX cosmetic company with Loreal group. She is the Research Associate of Research and Development Team, PohangTchnopark.

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