## P010 Protective Effects of Resilient Factor Derived from Fresh Water-grown Algae Chlorella on UVC-induced Cytotoxicity

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UVC irradiation is known to possess higher energy than long wave UV lights to penetrate materials and cause damage to skin. UV-C was shown to induce apoptosis (Schwarz, 1998) which is possible due to activate the CD95/Fas receptor (Rehemtulla et al. 1997) through the action of FADD phosphorylation and caspase 3 activation. The later further results in cleavage of PARP and causes DNA degradation (Fraser and Evan 1996). Cleaved PARP facilitates cellular disassembly and serves as a marker of cells undergoing apoptosis (Ghodgaonkar et al. 2008). We have previously shown that administration of resilient factor (RF) is able to prevent skin fibroblast from UVB irradiation-induced skin aging (Shih & Cherng 2008). In this study, we used this material to investigate more whether it could prevent damage of skin cells from apoptosis by UVC irradiation.

Human skin fibroblast 966SK cells were exposed to UVC (254nm) for total 15J/cm$^2$ in the presence of RF, Vitamin C, or Vitamin E. After the UVC exposure, cell proliferation was measured 72 h later. Caspase-3 activity was assay 1 and 72 h later and phosphorylated-FADD and cleaved PARP were measured 12 and 16 h after the UVC exposure. Our results reveal that RF (2 mg/ml) significantly prevents UVC-induced cytotoxicity after 72 h (149.7 ± 13.7 % cell viability compared to UVC-group 37.4 ± 3.8 %, $p < 0.005$, t-test). The activity of caspase-3 becomes lower than the controls (0.44 ± 0.02 compared to UVC-group 1.10 ± 0.12 mmol/0.1ml). Expressions of phosphorylated-FADD and cleaved PARP protein are also diminished in RF-treated cells than non-treated control after the UVC exposure. This study shows that RF derived from Algae Chlorella possesses an excellent potential on the protective effects from radio-hazard UVC via inhibition of apoptotic pathway.

| Time (h) after UV | - | 12 | 16 | 12 | 16 | 12 | 16 |
|---|---|---|---|---|---|---|---|
| RF before UV | - | - | - | + | + | - | - |
| RE after UV | - | - | - | - | - | + | + |

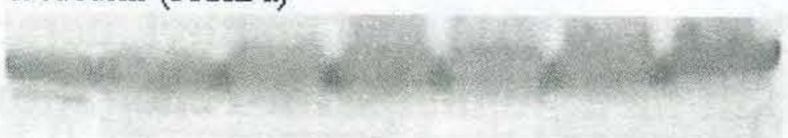
Phosphoylated FADD (28KDa)

α-tubulin (56KDa)

| Time (h) after UVC | - | 12 | 16 | 12 | 16 | 12 | 16 |
|---|---|---|---|---|---|---|---|
| RF before UVC | - | - | - | + | + | - | - |
| RF after UVC | - | - | - | - | - | + | + |

Cleaved PARP (89KDa)

α-tubulin (55KDa)



Fraser, A., Evan, G. 1999 Cell 85, 781–784
Ghodgaonkar, M.M., Zacal, N., Kassam, S., Rainbow, A.J., Shah, G.M. 2008 DNA Repair. 7, 617-32
Rehemtulla, A., Hamilton, C., Chinnaiyan, A., Dixit, V. 1997 J. Biolog. Chem. 272, 25783-25786.
Schwarz, T. 1998 J. Photochem. Photobiol. B, 44, 91-96.
Shih M-F., Cherng, J-Y. 2008 Eur. J. Dermatol. 18(3), 303-307