

Proteomic Research for Biomarker of Adaptive Response to Ionizing and Ultraviolet Radiation

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Organisms are exposed to various stresses such as oxidative stress and other environmental stresses, resulting in the diverse pathophysiological and pathological conditions with age. However, it is also known that low dose stress induces the adaptive response, which exerts protective effects against a subsequent higher dose. Radiation adaptive response has been widely observed in various biological systems. The protective responses are expected to bring anti-aging effects in dermal cells. Thus, in order to find anti-aging factors involved in adaptive response, we try to explore the biomarkers of radiation adaptive response in dermal cells, and lead to develop the protective agents against dermal aging. In the present study, we examined radiation adaptive response in dermal fibroblast, and explored the low dose irradiation-responsive proteins using proteomics on two-dimensional (2-D) PAGE. As a result, 0.1Gy pre-irradiation followed by 2-Gy challenging-irradiation at 3-hr interval induced radiation adaptive response in dermal fibroblast. From proteomics analyses of protein profiles of 0.1Gy- or non-irradiated dermal fibroblast, some candidate proteins, which are responsible for radiation adaptive response, were revealed.