ABSTRACT

Plant stem cell have regenerating properties like human stem cells. One of the plant stem cells that has been studied is tomato stem cells. Aqueous tomato stem cells extract is known to have cytoprotective and antioxidant activity to protect cells from exposure of free radicals that cause cell damage and death. Previous research reported, that medium of callus culture can produce a large amount of extract and has an essentially membrane that contain of protein with a clear potential in treating skin aging caused by the UV-light. Sources of free radicals such as UV-light can trigger an increase in the expression of pro-inflammatory mediators such as TNF-α, thus leads to inflammation process. TNF-α that use for a parameter of cytoprotective activity, preceded by inflammation that mediated skin aging. This study aims to examine cytoprotective activity of tomato callus medium (TCM) extract on the expression of TNF-α in the human gingival fibroblast cell exposed to UV-B rays.

Medium extract from tomato stem cells was obtained by protein precipitation method using acetone solvent. The determination of UV-B optimum dose was obtained by exposing the human gingival fibroblast cell with UV-B rays without TCM extract. The extract was tested for cytoprotective activity by observing cell viability using MTT assay method. The level of TCM extract that gave the highest cell viability was used to test TNF-α expression by immunocytochemical method. The results obtained were carried out by statistical analysis using SPSS with one-way ANOVA and Post Hoc Tukey LSD test at 95% confidence level.

The results indicated that TCM extract at the level of 50 mg/ml was able to increase cell viability of UV-B light at the 250 mJ/cm^2 dose treated human gingival fibroblast cell compared with the untreated cell to 25,18% significantly. In addition, TCM extract was able to decrease the inflammatory process as indicated in TNF-α cytokines expression. TCM extract expressed TNF-α cytokines of 35,32% ± 0,67 and decreased TNF-α cytokine expression in the human gingival fibroblast cell exposed to UV-B rays to 71,02%. Based on the cell viability and TNF-α cytokines expression, TCM extract can protect the human gingival fibroblast cell from UV-B exposure.

Keywords: TCM extract, UV-B rays, fibroblast cell, TNF- α expression