# ABSTRAK

**Latar belakang masalah:** *Photoaging* masih menjadi masalah kesehatan di Indonesia. Penelitian *in vitro* dan *in vivo* menunjukkan bahwa *EGCG* berperan pada pencegahan *photoaging*. Hingga saat ini, belum ada penelitian mengenai pengaruh *EGCG cream* 2,5%, 5%, dan 10% terhadap ekspresi *TGFβ RII*, ekspresi *$F_2$-isoprostane*, ekspresi *collagen type I*, jumlah kolagen di dermis, dan tingkat *TEWL* pada pencegahan *photoaging*.

**Tujuan:** Membuktikan pengaruh *EGCG* topikal terhadap pencegahan *photoaging* pada tikus Wistar yang diberikan paparan UV B.

**Metode penelitian:** Penelitian ini merupakan penelitian *true experimental* dengan *post test only-control group design*. Populasi penelitian adalah tikus Wistar yang memenuhi kriteria inklusi dan kriteria eksklusi, kemudian dilakukan *random allocation* untuk membagi sampel menjadi kelompok kontrol (kelompok kontrol positif K+ dan kelompok kontrol negatif K-) dan kelompok perlakuan (P0, P1, P2, dan P3). Besar sampel tiap kelompok adalah 12. Kelompok K- tidak diberikan perlakuan. Kelompok K+, P0, P1, P2, P3, dan P4 dipaparkan dengan sinar UV B. Kelompok P0 diberikan bahan dasar *cream*; kelompok P1, P2, dan P3 diberikan *EGCG cream* dosis 2,5%, 5%, dan 10%. Paparan UV B (dosis total 3100 mJ/cm$^2$) dan *EGCG cream* (2x sehari) diberikan selama 35 hari. Evaluasi dilakukan pada hari ke-36.

**Hasil:** *Epigallocatechin-3-gallate* dapat berinteraksi kuat dengan *IKK* dan *Nrf2* pada pencegahan *photoaging* berdasarkan pemeriksaan *in silico*. *Epigallocatechin-3-gallate* topikal terbukti dapat diabsorbsi oleh kulit tikus Wistar. *Epigallocatechin-3-gallate* topikal tidak terbukti meningkatkan ekspresi *TGFβ RII fibroblast*; menurunkan ekspresi *$F_2$-isoprostane fibroblast*; meningkatkan ekspresi *collagen type I* pada tikus Wistar yang diberikan paparan UV B. *Epigallocatechin-3-gallate* topikal terbukti meningkatkan jumlah kolagen di dermis dan menurunkan tingkat *TEWL* pada tikus Wistar yang diberikan paparan UV B. Terdapat hubungan antara ekspresi *TGFβ RII,* ekspresi *$F_2$-isoprostane,* ekspresi *collagen type I*, jumlah kolagen dan tingkat *TEWL*.

**Kesimpulan:** *EGCG cream* terbukti berperan pada pencegahan *photoaging*, dengan mencegah penurunan jumlah kolagen dan peningkatan tingkat *TEWL*.

**Kata kunci:** *photoaging, EGCG cream.*

# ABSTRACT

**Background:** Photoaging still becomes one of the health problems in Indonesia, that may decrease the quality of life. In vitro and in vivo studies showed EGCG plays role in photoaging prevention. There was no studies about the role of EGCG cream 2,5%, 5%, and 10% to the expression of TGFβ RII, $F_2$-isoprostane, collagen type I; dermal collagen count, and TEWL level in photoaging prevention.
**Purpose:** To prove the role of topical EGCG topikal in photoaging prevention in UV-irradiated Wistar mouse.
**Methods:** This was true experimental study with post test only-control group design. The population was Wistar mouse, that were filled inclusion and exclusion criterias, and were randomly allocated into: control group (positive control K+ and negative control K-) and treatment group (P0, P1, P2, and P3). The sampel size of each group was 12. K- group did not receive any treatment. K+, P0, P1, P2, and P3 groups were irradiated with UV B. P0 group was given based cream; P1, P2, and P3 were given EGCG cream 2,5%, 5%, and 10%. Ultraviolet B irradiation (the total dose was 3100 mJ/cm$^2$) and EGCG cream (2x daily) was given for 35 days. The evaluation were done in the 36$^{th}$ day.
**Results:** EGCG had strong interaction with IKK and Nrf2 in photoaging prevention based on in silico study. Topical EGCG was proven to be able to be absorbed by Wistar mouse's skin. Topical EGCG was not proven to be able to increase the expression of TGFβ RII fibroblast; decrease the expression of $F_2$-isoprostane fibroblast; and increase the expression of dermal collagen type I in UV B-irradiated Wistar mouse. Topical EGCG was proven to be able to increase dermal collagen count and decrease TEWL level in UV B-irradiated Wistar mouse. There were correlation between the expression of TGFβ RII, the expression of $F_2$-isoprostane, the expression collagen type I, dermal collagen count, and TEWL level.
**Conclusion:** This study proved that EGCG cream plays role in photoaging prevention, by inhibiting the dermal collagen count reduction and TEWL level elevation.

**Keywords:** photoaging, EGCG cream.