Chemotherapy-induced alopecia (CIA) is widely known because of its severity and high frequency. We recently revealed that laminin-332 (5) and -511 (10), the basement membrane zone (BMZ) components, precisely regulate hair growth both spatially and temporally during the induction of anagen hair growth; laminin-511 plays the positive role and laminin-332 does the negative role on hair growth. The purpose of this study is to elucidate the role of laminin-511 and -332 on the development of CIA.

Mice hair-depilation model was used, which was previously reported. At ninth day after depilation, 150 mg per kg body weight of cyclophosphamide was injected intraperitoneally. Mice were killed and the dorsal skin was harvested each day after cyclophosphamide was injected. We performed western immunoblotting, immunohistochemistry, in situ hybridization, and semi-quantitative RT-PCR analyses for those samples. In anagen, laminin-332 is reported to be lost at the BM around the outer root sheath of lower one thirds of hair follicle, it was reappearance after mid to late dystrophic catagen both quantitatively and qualitatively. In contrast, Laminin-511, which is considered to be an inducer of hair growth, was downregulated steadily after late dystrophic catagen in the epidermal and ORS keratinocytes. In conclusion, the reappearance of laminin-332 and the regression of laminin-511 at BM in the hair follicles may contribute to the development of CIA.