Epigallocatechin gallate enhances MAL-PDT cytotoxic effect on PDT-resistant skin cancer squamous cells

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Photodynamic therapy (PDT) has been used to treat certain types of non-melanoma skin cancer with promising results. However, some skin lesions have not fully responded to this treatment, suggesting a potential PDT-resistant phenotype. Therefore, novel therapeutic alternatives must be identified that improve PDT in resistant skin cancer. In this study, we analyzed the cell viability, intracellular protoporphyrin IX (PpIX) content and subcellular localization, proliferation profile, cell death, reactive oxygen species (ROS) detection and relative gene expression in PDT-resistant HSC-1 cells. PDT-resistant HSC-1 cells show a low quantity of protoporphyrin IX and low levels of ROS, and thus a low rate of death cell. Furthermore, the resistant phenotype showed a downregulation of HSPB1, SLC15A2, FECH, SOD2 and an upregulation of HMBS and BIRC5 genes. On the other hand, epigallocatechin gallate catechin enhanced the MAL-PDT effect, increasing levels of protoporphyrin IX and ROS, and killing 100% of resistant cells. The resistant MAL-PDT model of skin cancer squamous cells (HSC-1) is a reliable and useful tool to understand

PDT cytotoxicity and cellular response. These resistant cells were successfully sensitized with epigallocatechin gallate catechin. The in vitro epigallocatechin gallate catechin effect as an enhancer of MAL-PDT in resistant cells is promising in the treatment of difficult skin cancer lesions.

Methyl aminolevulinate

Non-melanoma skin cancer

Photodynamic therapy

Squamous cell carcinoma

catechin

epigallocatechin gallate

phosphatidylserine

protoporphyrin

reactive oxygen metabolite

survivin

antioxidant activity

apoptosis

Article

cancer resistance

cell culture

cell death

cell metabolism

cell proliferation

cell stress

cell survival

cell viability

cellular distribution

clonogenic assay

comparative study

controlled study

cytometry

cytotoxicity

down regulation

enzyme activity

flow cytometry

gene expression

gene sequence

human

human cell

hypoxia

MTT assay

phenotype

photodynamic therapy

protein expression

real time reverse transcription polymerase chain reaction

RNA extraction

skin carcinoma

upregulation

wound closure

wound healing assay