

Selective killing of melanoma cells with Air plasma and anti-HER2 antibody conjugated gold nanoparticle

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Plasma is effective in killing cancer cells. However, it can't distinguish cancer cells from normal cells. To solve this problem, an antibody against overexpressed protein in cancer cells and gold nanoparticles (GNP) which is harmless against the human body are used in this therapy [1]. In many cancer cells, some kinds of proteins have known to be overexpressed. These proteins are regarded as an attractive target for cancer therapy [2,3]. GNP can be used by conjugating with cancer specific antibody to achieve the selectivity in cancer treatment [4-6]. HER2 is a protein frequently overexpressed in melanoma cells. Thus, we made anti-HER2 antibody conjugated GNP (HER2-GNP) for targeting HER2 protein. After we added HER2-GNP into both G361 melanoma and HaCaT normal cells, plasma treatment resulted in significantly high death rate of G361 cells, compared with HaCaT cells. The death rate of G361 cells treated with HER2-GNP and plasma is over three times higher than that of HaCaT cells, which was slightly affected by plasma and HER2-GNP. Many vacuoles were observed in G361 cells. Furthermore, the destruction of HER2 consequently inactivated the phosphorylation of HER2, FAK and paxillin linked with HER2 protein. Therefore, this study suggests that plasma treatment with HER2-GNP can kill cancer cells effectively more than normal cells.

References

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