

Selective killing of ovarian cancer cells through induction of apoptosis by nonequilibrium atmospheric pressure plasma

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Recently, medical applications using nonequilibrium atmospheric pressure plasmas (NEAPPs) have attracted attention in the field of medicine because cells are not vacuum-compatible, and thermal damage to cells is negligible through appropriate tuning of the NEAPP parameters and experimental setup.

In this study, two independent ovarian cancer cell lines and fibroblast controls were treated with the high-density nonequilibrium atmospheric pressure plasma (NEAPP). Most ovarian cancer cells were detached from the culture dish by continuous plasma treatment to a single spot on the dish. Next, the plasma source was applied over the whole dish using a robot arm. *In vitro* cell proliferation assays showed that plasma treatments significantly decreased proliferation rates of ovarian cancer cells compared to fibroblast cells (Figure 1). FACS and Western blot analysis showed that plasma treatment of ovarian cancer cells induced apoptosis.

On the basis of these results, we propose the nonequilibrium atmospheric pressure plasma is a promising tool of anti-cancer therapy for the ovarian cancers.

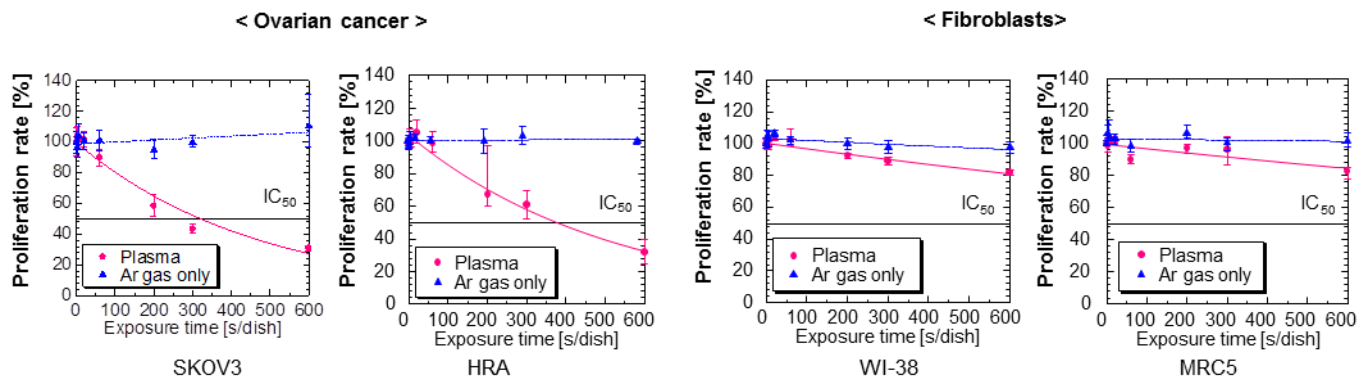


Figure 1: Ovarian cancer (SKOV3 and HRA) cells and fibroblast (WI-38 and MRC5) cells were treated with plasma. After 72 h of plasma treatments, cell proliferation was evaluated by MTS assays

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