CAMT Seminar

“Atmospheric pressure plasma for cancer therapy, plasma equivalent circuit, and plasma current classification”

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Center for Atomic and Molecular Technologies (CAMT)
(A12 棟 1 階会議室)
& Webex Link (hybrid)

Abstract

We compared the effects of plasma with thermal therapy on lung cancer with malignant pleural effusion. This study find out that the plasma can selectively kill lung cancer cells and the benign cells remain its viability. Besides, the thermal therapy kills both cancer cell and benign cells. To investigate what is the plasma factor that inhibits cancer cells, we investigated the effects of plasma-generated short-lived species, long-lived species, and electric fields on skin melanoma and basal cell carcinoma cells (A2058 cells, BCC cells) and normal cells (BJ cells, Detroit 551 cells) and found that the short-lived species do make selective inhibition to the benign and malignant cells. The second part of my study is that we mix water aerosol with plasma jet at downstream region makes the plasma jet generate more • OH. We designed different mixing chambers and adjusting the water aerosol flow rate maximize the • OH generated by plasma jet for biological applications. We also constructed an impedance matching circuit for a partial-discharge calibrated (PDC) atmospheric-pressure plane-to-plane DBD equivalent circuit. The last part of my work is that we used machine learning to distinguish the discharge current of different plasma. The plasma discharge can be different depending on the conditions, and the resulting discharge current has quite different electrical features. Hence, a real-time and cost-effective diagnosis of atmospheric-pressure plasma discharge can be possibly provided via current classification with deep learning model.

(Host: Satoshi Hamaguchi Ext：7913)