Identification of Specific Volatile Organic Compounds Derived from Cancer Cells

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Cancer is a leading cause of the mortality among all diseases, and the survival rate of patients depends on how early cancer can be detected. Conventional diagnosis methods are mostly invasive and take long time. Therefore, non-invasive and rapid diagnosis method was needed. There have been many efforts to identify volatile organic compounds (VOCs), which are exhaled from cancer patients, as a biomarker for diagnosis of cancer, but a lot of variables have been arisen by the condition of patients resulting in disturbing the identification of an exact biomarker. In this study, we identified VOCs using in vitro system in order to role out the variables. VOCs were collected from the headspace gas of lung cancer cell (SK-MES), stomach cancer cell (SNU-1), and also the normal lung cell (MRC-5) and stomach cell (SNU-NCC-19) as a control and analyzed using SPME-GC/MS. As a result, various VOCs were changed from the headspace of cancer cells compared to normal cell, and this means that the change in amount of VOCs came over from only cancer cells without any disturbance such as variables caused by the conditions of patients. We suggest that these VOCs can be used as a candidate biomarker for diagnosis of lung and stomach cancers.