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Primary Tumor Culture and Method Development Studies of Patients with Lung Cancer

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Objectives: In cancer studies, all molecular studies for diagnosis and treatment are performed from cell lines. Results from cells from a single patient are not valid for all groups of patients in the same disease. Thus, the results obtained are actually valid for a patient and are studies with low reliability, depending on the passage number. The aim of our study was to standardize the culture method in the highest yield using different methods for each patient group (small cell, non-small cell and mesothelioma) with lung cancer.

Methods: The tissue examined by the pathologist was brought to the cell culture laboratory in a cold cell medium (DMEM or RPMI-1640). The cleaned tumor tissue was taken into the petri dish in DMEM. The tumor cells were isolated by enzymatic (collagenase IV) or mechanical (mincing) and cultured in different cell medias (RPMI with 10% FCS, 2% FCS in Medium 199, etc.) specific to the cell type. The materials brought to the pathology laboratory were examined by staining with Hemotoxylin-Eosin, a standard staining method after the appropriate methods were applied to the cell block. Immunohistochemistry was performed in required samples.

Results: 6 patients, 3 non-small cell and 3 mesotelyoma, were cultured with different methods. All of the materials of the six patients had sufficient tumor tissue. There were a large number of tumor cells in the cell block materials of 6 patients, including malignancy-compatible morphology and high atypical mitosis. The tumor tissue observed in the present materials was evaluated in accordance with the diagnosis given from the patient's resection material. Immunohistochemical study was performed for differential diagnosis in patients with suspicious about the necessary compliance.

Conclusion: Mesothelioma cancer was more aggressive than small cell lung cancer, so it was more rapidly cultured. In the culture of non-small cell cancer cells, the enzymatic (Kollegenaz) method was observed to be faster compared to the mechanical path. However, when working with enzymatic path, the exposure of cells to excess collagenase or the percentage of concentration could not be adjusted, and cancer cells were also damaged and cannot be cultured. In both culture methods, it was observed that the cell media of 2.5% FCS Medium199 medium was more effective in the process of recovery and proliferation of cells but the time planned for culture (25-30 days) is still long. For this reason, in order to shorten the culture period, 2.5% FCS Medium199 cell media will be changed and new experiments will be made.

Keywords: Cell Line, lung cancer, method development, primary cell culture