Studies on Immediate Transpulmonary Passage of Tumor Cell Emboli in Mice

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In previous work we have shown that tumor cell emboli pass through the pulmonary circulation immediately in rabbits and rats (Cancer Research **12**: 731, 1952). There was good correlation between incidence of immediate transpulmonary passage and incidence of spontaneous metastasis in organs beyond the lungs. Indeed, the results suggested that many secondary tumors in organs beyond the lungs were derived from tumor cell emboli which had traversed the pulmonary circulation immediately.

In the present work similar experiments were performed in C57 black mice with the transplantable fibrosarcoma 241. This tumor metastasizes spontaneously to the lungs (Cancer Research **10**: 357, 1950) and rarely to organs past the lungs. These experiments were performed to acquire further data on the correlation between incidence of immediate transpulmonary passage and incidence of spontaneous metastases past the lungs. Since T-241 rarely metastasizes beyond the lungs, a low incidence of immediate transpulmonary passage of tumor cell emboli would be expected.

A tumor suspension in saline was injected into the brachial vein of each mouse; simultaneously the aortic blood was collected. This aortic blood was then injected intravenously into a second normal mouse. If the second mouse developed tumors, this would mean that immediate transpulmonary passage of tumor cells had occurred in the first mouse.

Of ten experiments, immediate transpulmonary passage was demonstrated in one. Thus it is concluded that immediate transpulmonary passage of fibrosarcoma cells may occur in mice, and that the incidence of such passage is low. This low incidence probably accounts for the rarity of spontaneous metastases in organs past the lungs.