68. On Malignolipin. I. Detection of Malignolipin in Blood
(A Method for Early Diagnosis of Malignant Tumors)

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Kósaki et al.*) isolated from freshly excised human malignant tumors a new phospholipid, malignolipin, composed of spermine, choline, phosphoric acid, and fatty acid. It could be found specifically in malignant tumors, but never in normal tissues. As malignolipin can also be isolated from the blood and ascites of cancer bearing patients and Ehrlich's cancer ascites of mice, a handy method for exact detection of malignolipin in blood was devised to serve for the diagnosis of cancer.

One ml of venous blood is added with 9.0 ml of absolute ethanol immediately after it is taken out, heated for 30 min under a reflux cooler on boiling water bath, filtered after cooling in a refrigerator, and the filtrate is evaporated to dryness in vacuo. The dried residue is extracted with 10 ml of hot absolute ethanol, filtered after cooling in a refrigerator, concentrated to 0.5 ml in vacuo, added with 2 vols of acetone and centrifuged. The precipitate is washed with acetone, dissolved then in chloroform, filtered and the filtrate is concentrated to 0.1 ml. The concentrate is paper-chromatographed with methylal-pyridine-water (3.0 : 3.5 : 3.5), revealed by a ninhydrin spray, and then treated by a spray of an ethanol solution of copper nitrate. Malignolipin reveals itself as a red spot of Rf. 0.38 on the paper. This kind of paper-chromatography with methylal-pyridine-water originated by the authors was confirmed to be an excellent one for the separation of various phospholipids.

The detection of malignolipin in blood by this method was all negative with the blood of 18 normal persons and of 8 patients not bearing malignant tumors (nephritis, aplastic anemia, leucemia, duodenal ulcer, prostate hypertrophy, eczema, and axillary odour), but was positive without exception in 25 patients bearing cancer (of lung, stomach, rectum, maxilla, uterus, mamma, urinary bladder, and prostate). The principle of the present method differs from all the other cancer tests ever reported on the point that it is able to detect a known

substance specific to malignant tumors. The procedure is simple and the results can be easily determined. This method seems, therefore, to be capable of discriminating with certainty cancer-bearing patients from non-bearers.

After the complete removal of a malignant tumor, the results of this test show negative, but remain still positive when the removal is incomplete. Even after an incomplete removal, the positivity of reaction reduces in grade in case where the growth of the unremoved portion of the tumor is suppressed by the application of X ray irradiation. Therefore, this test may also be used for the postoperative control of a patient to estimate the therapeutic effect.

Among the 4 cases, in which this test was positive while no clinical sign suggesting the existence of a malignant tumor could be found, one case (gastritis) was ascertained on operation to have a small cancer nest in stomach, one case (prostate hypertrophy) to have a cancer of another organ (stomach) after 3 months, and, 2 cases (prostate hypertrophy, papilloma of urinary bladder) to have a cancer of the proper organs after 1–2 months. These facts suggest that the present test may serve for the early diagnosis of cancers.

To summarize, the present detection of malignolipin in blood can be stated as to be an excellent clinical method for the diagnosis of malignant tumors, especially for their early discovery.