that possible defects in the metabolism of purines or of alloxan in man may play some role in the etiology of diabetes. If the diet contains sufficient nicotinic acid, it might combine with alloxan so formed and thereby prevent its action. Nicotinic acid thus might play some part in the prevention of diabetes.

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Transmission of the Bunchy Top Disease of Papaya (*Carica papaya* L.) by the Leaf Hopper *Empoasca papayae* Oman

FRANCISCO SEÍN, JR., and JOSÉ ADSUAR

Agricultural Experiment Station, University of Puerto Rico, Río Piedras, P. R.

In 1946 Adsuar (*1*) reported the successful transmission of papaya bunchy top by a leaf hopper of the genus *Empoasca*, presumably identical with the one previously used experimentally by Jensen (*2*) in 1938. In their experiments, Adsuar and Jensen used as vectors the leaf hoppers collected on diseased papaya plants in the field but did not identify them specifically. Specimens collected on papaya in Puerto Rico were described by P. W. Oman (*3*) as *Empoasca papayae*, but as more than one species of *Empoasca* may occur on papaya, the specific identity of the vector used by Adsuar and Jensen can only be presumed.

Specific identification of the females of the genus *Empoasca* being practically impossible, the senior author followed a simple method of elimination which permits the use of males only as vectors. Specimens of both sexes collected from diseased papaya trees were exposed to the vapors of ether to render them quiet long enough to permit the separation of the males from the females under the binocular. The desired number of males were released inside cellophane casings inserted on the upper part of the stem and tender leaves of healthy papaya plants.

The identification of the 169 male leaf hoppers recovered dead two or three days later, when the casings were removed, was confirmed by P. W. Oman, of the U. S. Department of Agriculture, as his *Empoasca papayae*.

Out of 30 healthy papaya plants, on each of which from 5 to 10 males were isolated, 9 plants developed the symptoms of bunchy top in about a month and a half. Thirty similar check plants, kept with the others in a greenhouse from which leaf hoppers were excluded, remained healthy. This experiment conclusively demonstrates that *Empoasca papayae* Oman is a vector of the bunchy top disease of papaya.

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Fluorescein as an Agent in the Differentiation of Normal and Malignant Tissues[1]

GEORGE E. MOORE[2]

Department of Surgery, University of Minnesota Medical School, Minneapolis

For many years investigators have noted and described the differential appearance of various tissues under ultraviolet light. In 1934, Danckwortt (*1*) wrote an extensive monograph encompassing the entire subject.

Several authors have reported the use of ultraviolet light as an aid in distinguishing neoplastic tissue. Some have even claimed a specific fluorescence for certain tumors. This, however, has never been consistently substantiated.

Herly (*2*), in 1944, reported that differences in the macroscopic appearance of benign and malignant tumors of the breast were enhanced when viewed under ultraviolet light. Using this technique, in a series of 200 breast tumors suspected of malignancy only one error in diagnosis was acknowledged.

Since October 1946, sodium fluorescein has been injected into patients subjected to laparotomy for gastric carcinoma, with the hope that it might accentuate the differences in appearance of normal and malignant tissues as revealed under ultraviolet light. Initially, 5 cc. of 20 per cent sodium fluorescein was injected intravenously after the viscera were exposed, and then inspected with an ultraviolet lamp emitting rays at about 3,600°. In these first cases no difference in fluorescence of normal and tumor tissues was noted. Next, the dye was injected at various times prior to the operation. It became evident that, when the interval between injection and examination was between 3 and 8 hours, a difference between normal and malignant tissues could be observed. Carcinomatous implants of tumor tissue on the peritoneal surfaces were readily seen. These fluoresced with a vivid yellow color. When, however, the tumor tissue was situated more than a few millimeters below the surface, no fluorescence was observed. This might be related to the fact that ultraviolet light can penetrate only a few millimeters of tissue.

TABLE 1

OBSERVED CORRELATION BETWEEN FLUORESCENCE OF TUMOR OR TUMOR FRAGMENTS AND ULTIMATE HISTOLOGICAL DIAGNOSIS

Site of tumor	Total cases	Correlation*		
		Good	Poor	Failure
Gastrointestinal tract	17	11	3	3
Brain and spinal cord	12	11	1	0
Miscellaneous	17	9	2	6
Total	46	31	6	9

* Good indicates high grade of fluorescence with verified microscopic diagnosis; poor, only slight fluorescence; and failure, that the tumor or tumor fragments did not fluoresce.

To date, 46 neoplasms have been examined with this tech-

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[2] Senior Research Fellow with the National Institute of Health, U. S. Public Health Service.