

# DETECTION OF A COMMON CANCER ANTIGEN IN SOME HUMAN TUMORS OF DIFFERENT LOCALIZATION

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In a previous paper [4] the author described the detection of a specific antigen in the tissue of a malignant tumor of the human large intestine, which could be found neither in the normal intestinal mucous membrane nor in other normal organs. This antigen was called "specific cancer antigen," a term which is largely conventional. The antigen itself can be detected as one which is qualitatively new in malignant tissue only within the limits of sensitivity of the precipitation reaction in agar. This fact does not rule out the possibility that the cancer antigen is present in a very low concentration in nonmalignant tissue.

A subsequent investigation showed that this antigen is in fact present in tissue with precancerous changes—in certain polyps of the large intestine [6].

## EXPERIMENTAL METHOD

Experiments were carried out using the precipitation reaction in agar, in the semi-micromodification of A. I. Gusev and V. S. Tsvetkov [2]. Monospecific cancer antisera against tumor tissue from the human large intestine were used. The sera were obtained by immunizing rabbits with saline extracts of cancer tissue from 7-8 individuals. The antisera were then absorbed with normal antigens of the serum, kidney, spleen, lung, liver, and normal mucous membrane of the large intestine. After absorption, the sera reacted only with extracts of malignant tumors, with which they formed one precipitation band.

The tumor extracts were prepared by grinding pieces of tissue with a glass pestle. The ground tissue was suspended in veronal-medinal buffer solution (pH 8.6) or in physiological saline. One part of solution was taken to 2 parts of tissue. The suspension was kept for 18 h in a refrigerator at 4-6° and then centrifuged for 30 min at 9000 rpm. The supernatant was tested in the precipitation reaction in agar. The presence of cancer antigen in the extract from a tumor from a particular localization was demonstrated by the formation of a precipitation band between the tumor extract and the monospecific cancer antiserum against the tissue of a carcinoma of the large intestine.

## EXPERIMENTAL RESULTS

As the table shows, in 12 of the 51 tumors, the specific cancer antigen was found. The tumors in which it was identified were situated in the stomach, lung, esophagus, and thyroid. The neoplasms varied in their histological structure, for they included squamous-cell carcinoma, adenocarcinoma, solid carcinoma, and small-cell carcinoma. All the tumors contained the identical cancer antigen. This was shown by the results of the gel precipitation reaction (see Figure).

Hence, some human tumors with different histological structure and localization possess a common specific cancer antigen.

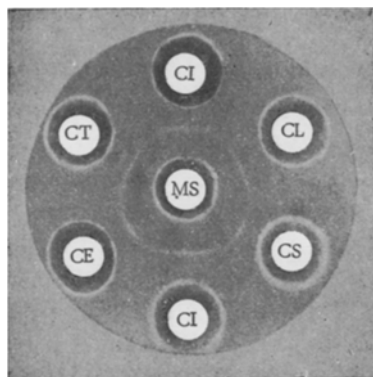
Investigations of the antigenic structure of tumors in man and animals have shown that tumor and embryonic antigen are identical [1, 5, 7]. It may naturally be asked whether the cancer antigen detected in the present experiments is embryonic. To answer this question, experiments were carried out with extracts of human embryonic tissues. Extracts were prepared from these by the method described above, using tissues from 6-8-week embryos. Anlagen of the internal organs (together, or the anlage of the intestine separately) were extracted. To detect the cancer antigen, the extracts of the embryonic tissues were

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# Detection of Cancer Antigen in Tumors of Different Localization and Histological Structure

| Localization of cancer | Histological structure of cancer | Number of cases | Found | Not found |
|------------------------|----------------------------------|-----------------|-------|-----------|
| Stomach                | Adenocarcinoma                   | 6               | 3     | 3         |
|                        | Solid                            | 5               | 2     | 3         |
|                        | Colloid                          | 1               | 1     | —         |
| Lung                   | Squamous-cell                    | 11              | 2     | 9         |
|                        | Adenocarcinoma                   | 1               | —     | 1         |
|                        | Solid                            | 1               | 1     | —         |
| Esophagus              | Squamous-cell                    | 8               | 2     | 6         |
| Thyroid                | Small-cell                       | 1               | 1     | —         |
|                        | Fetal-embryonic adenoma          | 1               | —     | 1         |
|                        | Carcinoma                        | 1               | —     | 1         |
|                        | Macro-microfollicular goiter     | 1               | —     | 1         |
| Mammary gland          | Adenocarcinoma                   | 1               | —     | 1         |
|                        | Scirrhous                        | 3               | —     | 3         |
|                        | Solid                            | 4               | —     | 4         |
| Ovary                  | Folliculoma                      | 1               | —     | 1         |
|                        | Cystic carcinoma                 | 1               | —     | 1         |
| Sarcoma                | Leiomyosarcoma                   | 1               | —     | 1         |
|                        | Spindle-cell sarcoma             | 1               | —     | 1         |
|                        | Fibrosarcoma                     | 1               | —     | 1         |
|                        | Angiosarcoma                     | 1               | —     | 1         |
| Total                  |                                  | 51              | 12    | 39        |



tested in the precipitation reaction in agar against monospecific cancer antisera and tumor tissue from the large intestine. The tissues of 12 embryos were tested, but in no case were they found to contain the specific cancer antigen. It may thus be concluded that the antigen under investigation is not embryonic.

The fact that the cancer antigen could be detected by means of cancer antisera against tumors of the large intestine in only some of the investigated tumors confirms, in the authors' opinion, the hypothesis that several immunologically independent groups of specific tumor antigens exist [3]. The possession of specific antigens in common is possibly associated with the existence of common etiologic factors causing malignant change.

Identity of the cancer antigen. MS) monospecific cancer anti-serum against tumors of the human large intestine; cancer extracts: CI) intestine, CE) esophagus, CS) stomach, CL) lung, CT) thyroid.

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