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Precipitin Antisera for Malignant Tissue.

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Tissue from human gastric carcinoma was prepared according to the method of Spinka and Weichselbaum.¹ Aluminium cream² was used to adsorb the ground carcinomatous tissue and injected into the thigh muscles of rabbits. The resulting antisera, tested biweekly, lost precipitins for human blood-proteins within 1 to 6 months, but still reacted with autolysates of human gastric carcinoma, although not with autolysates of 2 series of 14 different normal organs.

These specific antisera were tested with sera of carcinomatous patients, of normals, and of variously diseased individuals; 67% of patients with carcinoma of the stomach gave positive reactions, but as there are several varieties of gastric carcinoma, this low percentage may be due to the fact that different types may be made up of proteins of different antigenicities. This point is under investigation. Patients with other types of carcinoma had positive sera, but not in so great a percentage. Normal sera and those from the variously diseased did not react with one exception—a patient with pulmonary abscess (carcinoma not excluded).

Antisera for carcinoma of the cervix gave 87% positive reactions with 8 sera of patients with carcinoma of the cervix. The sera of normal individuals did not react nor did sera of the various diseases with the same exception noted above. Three antisera for carcinoma of the cervix reacted with autolysates of 2 different carcinomas of the stomach and of a carcinoma of the cervix. Only one of these antisera gave a few positive reactions with autolysates of rectal carcinoma.

A precipitin antiserum for human rectal carcinoma reacted with autolysates of carcinoma of the rectum and breast, but not with autolysates of rat-carcinoma No. 256 or rat-sarcoma No. 10. Antisera for rat-carcinoma No. 256 and rat-sarcoma No. 10 reacted with autolysates of rat-carcinoma No. 256 and rat-sarcoma No. 10, but not with autolysates of human carcinoma of the breast or rectum.

Heretofore, it was difficult to prepare specific antisera for tissue-

¹ Spinka, I., and Weichselbaum, P. K., *PROC. SOC. EXP. BIOL. AND MED.*, 1938, **38**, 447.

² Welker, Wm. H., and Tracy, G., *J. Biol. Chem.*, 1915, **22**, 55.

proteins because antibodies for blood proteins appear no matter how well the finely ground tissue is washed—even to a negative precipitin-reaction. Spinka and Weichselbaum¹ have attempted to prepare specific antisera by the adsorptive method (*in vivo* and *in vitro*). They found that the titer of the antiserum to the specific protein was diminished or disappeared entirely. We have confirmed their results (*in vitro*) in the case of antisera for malignant tissue. In the method outlined above, adsorption is not necessary because the antibodies for blood-proteins disappear in a shorter time than do the antibodies for proteins of carcinomatous tissue.

Antisera for carcinoma, as prepared by Lumsden,³ Pybus and Whitehead,⁴ Phelps,⁵ must necessarily contain antibodies for blood-proteins as well as for malignant-tissue proteins. The blood-protein antibodies may well be responsible for the toxicity of these antisera observed by these investigators.

Conclusions. 1. Specific antisera have been prepared for the proteins of malignant tissue. 2. There is a suggestion of a relative anatomic specificity of carcinomatous tissue, as a greater number of positive reactions occur with autolysates of the homologous tissue and with sera of cases having the same type of malignancy. 3. These precipitins for the proteins of malignant tissue show promise as diagnostic aids. A high percentage of sera from patients with malignant tumors react positively. The higher percentages of positive reactions were obtained in cases where the malignant growth had the same anatomic location as the tumor from which the antiserum had been prepared. 4. Our preliminary results indicate that possibly these precipitins are species-specific, because antisera for rat-tumors do not react with autolysates of human carcinoma and *vice-versa*.

³ Lumsden, T., *J. Path. and Bact.*, 1931, **34**, 349.

⁴ Pybus, F. C., and Whitehead, H. R., *J. Path. and Bact.*, 1929, **32**, 195.

⁵ Phelps, H. J., *Am. J. Cancer*, 1937, **31**, 441.