Data indicating that exposure to various injurious factors may lead to a fall in the concentration of SH-compounds, of which the most important is reduced glutathione, have recently been published. For instance, it has been shown that injury to the gastric mucosa of rats induced by ethanol is closely connected with a marked fall in the reduced glutathione concentration in the mucosa [8]. Injection of prostaglandin E_2, or of one of the compounds containing SH-groups, before administration of ethanol considerably reduced erosion formation, whereas injection of substances blocking the formation of compounds with SH-groups (N-ethylmaleimide), including glutathione, caused weakening of the protective properties of the gastric mucosa. Accordingly the authors cited postulated that glutathione and other SH-compounds may influence the structure and formation of protective mucus in the stomach.

It can thus be concluded from analysis of data in the literature and the results of our own investigations that the system of glutathione and glutathione-dependent enzymes plays an important role in the mechanisms of pathogenesis of ulcer formation in the gastroduodenal zone.

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BIOSYNTHESIS OF PREGNANCY-SPECIFIC β_1-GLOBULIN IN RATS IN VIVO

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Pregnancy in man and mammals is accompanied by the appearance of pregnancy-associated antigens in the blood stream, in the composition of α- and β-globulins. In rats during pregnancy α_1- and α_2-globulins [2, 5], α-fetoprotein [5], and pregnancy-specific β_1-globulin (PSG) [3, 4, 9] have been identified.

PSG in rats is the analog of human trophoblast-specific β_1-glycoprotein (TSG) [6]. Similar analogs also have been found in the blood serum of several other mammals [11-13]. TSG was found in the blood serum of pregnant women [6, 15], and later in the blood serum of patients with trophoblastic tumors [7, 15]. TSG, synthesized by cells of the syncytiotrophoblast [8], is now considered to be a reliable marker of pregnancy and of trophoblastic tumors [15].

The aim of this investigation was to determine the site of synthesis of PSG during pregnancy in rats.

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TABLE 1. Immunodiffusion Assay of PSG in Blood Serum after Injection of Suspension of Minced Tissue from Organs of Pregnant Rats into Intact Animals

Organ	Time of taking blood, days					
	3	5	7	9	11	13
Placenta	12/0	11/0	12/0	10/0	16/5	10/0
Liver	14/0	12/0	11/0	13/0	10/0	11/0
Kidneys	12/0	16/0	14/0	12/0	11/0	13/0
Lung	16/0	12/0	14/0	16/0	14/0	11/0
Heart	12/0	14/0	12/0	12/0	14/0	10/0
Spleen	14/0	14/0	16/0	14/0	10/0	12/0
Extract of placenta	11/0	10/0	12/0	10/0	12/0	11/0

Legend. Numerator — number of samples tested; denominator — positive results.

EXPERIMENTAL METHOD

Monospecific antiserum against PSG was obtained by immunizing rabbits with a semipurified preparation obtained by affinity chromatography, and adsorbed with serum of male and nonpregnant female rabbits. PSG in the animals' sera was assayed by the method in [14] in the modification in [10].

In the experiments of series I in pregnant animals during the second half of pregnancy, samples of tissue were taken under ether anesthesia from the placenta and other organs, washed, and carefully cut into small pieces with scissors in Eagle's medium, after which the suspension was injected into intact males and nonpregnant females, subcutaneously and intraperitoneally in a dose of 1 ml. Groups of animals were then killed under ether anethesia on the 3rd, 5th, 7th, 9th, 11th, and 13th days and blood was taken for PSG assay.

In the experiments of series II the animals were given in intraperitoneal injection of a suspension of placenta, followed on the 11th day by intravenous injection (into the caudal vein) of radioactive label containing a mixture of ^{14}C-labeled amino acids from a *Chlorella* digest in a dose of 20 μCi, or ^{14}C-labeled lysine with a total activity of 40 μCi. The animals were killed 2 h later under ether anesthesia and blood was taken for subsequent PSG assay.

In the experiments of series III (control) a suspension of organs of males and nonpregnant females and also an extract of placenta were injected into intact males and nonpregnant females under conditions similar to those described above. The rats were killed under anesthesia at the same times, blood was taken, and PSG was assayed in the serum.

The radioimmunodiffusion test [1] was carried out under standard conditions, using blood serum from pregnant animals, added to the sample for testing, as the PSG standard. Immunodevelopment was carried out for 18 h in a humid chamber, followed by washing in buffered physiological saline with three or four changes, followed by drying under chromatography paper under a fan. Highly sensitive RF-3 film was laid on the dried slides and pressed between two pieces of glass of the corresponding size. Autoradiographic development continued for 25-30 days

EXPERIMENTAL RESULTS

The results of determination of rat PSG by double immunodiffusion in agar in the blood serum of intact animals and of nonpregnant females, after injection of minced tissue of the placenta and other organs of pregnant animals, and also of an extract of placenta, are given in Table 1. PSG was found only after injection of a suspension of minced placental tissue into intact animals, on the 11th day after explantation. No PSG could be detected, however, after injection of a suspension of minced tissue from other organs from pregnant animals. Similar results were obtained when a suspension of minced tissue from organs of males and nonpregnant females was injected into the control animals.

In the next part of the work an attempt was made to discover whether PSG is synthesized by the suspension of minced placental tissue or whether it was simply dispersed mechanically into the intact animals.

In the experiments of series II a suspension of minced placental tissue was injected into the animals, and the radioactive label was injected 11 days later. Blood was taken from the animals after 2 h, and assayed for PSG. Altogether 60 animals were used in the experiments, and blood was taken from 30 of them on the 11th day. The remaining animals died before the specified time. By the radioimmunodiffusion test PSG synthesis was found in eight rats. In the double immunodiffusion test sera from eight animals reacted identically to antigen of the test system, and this band contained the radioactive label.

It can be concluded from these results that PSG is synthesized by the placenta. Other organs of pregnant rats (liver, kidney, lung, heart, spleen), however, are unable to synthesize this antigen.

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