

ONCOLOGY

A STUDY OF THE ANTIGENIC PROPERTIES OF EHRLICH'S CARCINOMA AFTER PASSAGE THROUGH THE CHORIO-ALLANTOIC MEMBRANE OF THE CHICK EMBRYO, AND THE ANAPHYLACTIC REACTION WITH DESENSITIZATION

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A study of the antigenic properties of tumors after passage through a chick embryo is of great interest because up till now there is no agreement concerning the nature of the changes these properties undergo [1,3-5]. In a study of the antigenic characteristics of Ehrlich's carcinoma after passage through the chorio-allantoic membrane of the chick embryo a change of the original antigenic activity of the tumor, as shown by the complement-fixation reaction, was found to have occurred during the passage [2].

The present investigation concerns changes in the antigenic properties of Ehrlich's carcinoma during passage, and is based on the anaphylactic reaction with desensitization.

METHOD

For the experiments we used guinea pigs weighing 250-300 g. Sensitivity was produced subcutaneously, and as antigens we used an aqueous-saline extract of Ehrlich's carcinoma which had not undergone passage, and material after one or five passages of this tumor through a chick embryo. After twenty-one days, complete desensitization of the animals to the antigens from normal tumors was effected by use of normal mouse serum and an aqueous-saline extract of tissues of a 14-day chorio-allantoic chick embryo membrane. Next a critical injection of the antigens to be studied was given. The antigen doses which were used for sensitization, desensitization, and for the critical injection were calculated in terms of protein, which was determined by Conway's micro-method. Altogether we carried out two series of experiments by this method on 58 animals.

RESULTS

In the experiments we made a comparative study of the antigenic properties of Ehrlich's carcinoma after the first and fifth passages through chick embryo, and of the tumor without passage. The table shows the results of one such series of experiments.

After sensitization of the animals to the tissue which had undergone one or five passages, and to the tumor without passage, we carried out desensitization with the antigen from the chorio-allantois and to mouse serum; this procedure revealed the presence of species-specific antigens in the tissues investigated.

Pigs sensitized with material which had undergone one passage, when sensitized with antigen of the chorio-allantois, responded by a reaction which was either + or ++, whereas animals sensitized to material after five passages gave a more marked ++ reaction after desensitization. This result indicates that during the passage through the chick embryo there is an increase in the amount of chick antigens, probably on account of the presence of the chorio-allantoic tissue in the heterograft. Animals sensitized by a tumor which had not been passaged or by material which had undergone only one passage give a marked ++ or +++ reaction on desensitization. Animals sensitized

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Group of animals	Sensitization				Desensitization						Critical injection		
	Antigen	No. of animal	Weight (g)	Amt. of protein (in mg)	chorio-allantois			mouse serum			Antigen	Amt. of protein (in mg)	Reaction
					1.8 mg	1.8 mg	1.8 mg	6.5 mg	13 mg	13 mg			
Experimental	First pas- sage	1	259	1.7	++	+	-	+++	-	-	Tumor without passage	3.2	+++
		2	270	1.7	+	+	-	++	+	-		3.2	++
		3	302	1.7	+	++	-	+	++	-		3.2	++
		4	295	1.7	+	++	-	+	++	-		3.2	+++
		5	270	1.7	+	+	-	+++	+	-		3.2	++
		6	299	1.7	+++	+	-	++	-	-		3.2	+
		7	301	1.7	++	+	-	+++	-	-		3.2	++
	Fifth pas- sage	1	261	1.7	+	++	-	+	+	-	Ditto	3.2	+
		2	270	1.7	++	-	-	++	+	-		3.2	+
		3	254	1.7	++	+	-	++	+	-		3.2	++
		4	305	1.7	+	+	-	+	+	-		3.2	+
		5	304	1.7	+++	+	-	++	+	-		3.2	+
		6	287	1.7	+	++	-	++	-	-		3.2	++
		7	295	1.7	++	+	-	+	-	-		3.2	++
	Tumor without passage	1	301	1.6	-			+++	-	-	First passage	3.4	++
		2	299	1.6	-			++	+	-		3.4	++
		3	255	1.6	-			++	-			3.4	+++
		4	277	1.6	-			+++	-			3.4	++++
		5	280	1.6	-			+	++	++		3.4	++++
		6	289	1.6	-			++	+	+		3.4	++
		7	297	1.6	-			+	+++	+++		3.4	++++
Control	First pas- sage	1	301	1.7							First pas- sage	3.4	+
		2	257	1.7								3.4	++++
		3	289	1.7								3.4	++++
	Fifth pas- sage	1	279	1.7							Fifth pas- sage	3.4	+++
		2	305	1.7								3.4	++++
		3	263	1.7								3.4	++++
	Tumor without passage	1	300	1.6							Tumor without passage	3.2	++++
		2	285	1.6								3.2	++++
		3	278	1.6								3.2	+++

Note: -absence of reaction; + nose scratched briefly; ++ vigorous scratching, fur ruffled, sneezing, breathlessness, coughing; +++ ditto, but more marked, defecation, micturition; ++++ convulsive leaps, spasms, usually terminating in death.

with material which had undergone five passages of a tumor react much more weakly to mouse antigen: in this case we observed only a + or ++ response.

With a critical injection which was usually given reciprocally with antigens to be studied (see table), guinea pigs sensitized with material which had undergone five passages of the tumor reacted more weakly (+ or ++) than animals sensitized with material after one passage, or after a tumor which has not been passaged (++ or +++). This

result also confirmed that passage of the tumor through the chorio-allantois of a chick embryo is associated with a change in the antigenic properties of the tumor.

A study of the antigenic properties of Ehrlich's carcinoma after passage through the chick chorio-allantoic membrane in the anaphylactic reaction with desensitization showed that under these circumstances the heterograft leads to a loss of those species-specific antigens of the tumor which are common to mouse serum.

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All abbreviations of periodicals in the above bibliography are letter-by-letter transliterations of the abbreviations as given in the original Russian journal. *Some or all of this periodical literature may well be available in English translation.* A complete list of the cover-to-cover English translations appears at the back of this issue.