protection at all, i.e. in a mortality identical with that for non-treated controls. On the other hand, all the animals receiving the lipid by mouth and an antihistamine parenterally were fully protected.

The nature of the protective materials present in the lipids studied and the mechanism by which they exert their effect are as yet unknown. Since such lipids as egg-yolk, soy bean lecithin, or linoleic acid were found to be ineffective against anaphylactic shock, the type of lipid activity observed is not directly dependent on phospholipids or unsaturated fatty acids as such, nor is it related to the arachis oil factor described by D. A. LONG and MARTIN[2] or to the egg-yolk fractions active in the dietary experiments of COBURN *et al.*[3] or CHANG and FRENCH[4]. The anti-anaphylactic activity of sesame, cotton-seed oil etc. is furthermore clearly distinguished by the fact that one single oral dose is effective whereas in the experiments of the last-named authors the lipid had to be injected or fed over several weeks in order to suppress tuberculin or Arthus reactions in the guinea-pig.

It is a pleasure to acknowledge the valuable technical assistance given by Miss E. HEITZ.

R. JAQUES

Research Laboratories of the Pharmaceutical Department of CIBA Limited, Basle (Switzerland), May 27, 1958.

Zusammenfassung

Gewisse Lipide besitzen am Meerschweinchen nach einmaliger peroraler Verabreichung eine mehrstündige anti-anaphylaktische Schutzwirkung. Der anti-anaphylaktische Effekt von parenteral zugeführten Proteus-Polysacchariden wird durch perorale Zufuhr solcher Lipide aufgehoben, während Antihistaminica in ihrer Schutzwirkung nicht beeinflusst werden.

[2] D. A. LONG and A. J. P. MARTIN, Lancet *270*, 464 (1956).
[3] A. F. COBURN, C. E. GRAHAM, and J. HANINGER, J. exper. Med. *100*, 425 (1954).
[4] I. CHANG and C. E. FRENCH, Proc. Soc. exp. Biol. Med. N.Y. *93*, 366 (1956).

Organ Weights of TE Mice Bearing Ehrlich Ascites Carcinoma Growing in the Solid Form and of C3H Mice Bearing Spontaneous Mammary Carcinoma

In the course of our studies on the anaemia of cancer, we observed that the weight of the spleen and the liver of cancerous mice was higher than the weight of the spleen and the liver of healthy mice.

MÜLLER[1] reported that in humans who died from various carcinomas the weight of the spleen sometimes though not always was significantly higher than the weight of the spleen of non-cancerous individuals (cf. also CALO[2]).

In this communication we report observations on the weight of spleen, liver and kidneys of TE mice bearing Ehrlich ascites carcinoma in the solid growing form and of C3H mice bearing spontaneous mammary carcinoma.

Male TE mice, kindly supplied by the Animal Department of the British Medical Council, were inoculated intramuscularly with Ehrlich ascites carcinoma and killed as described elsewhere[3]. The spleen and liver were removed and weighed. In one series the dry weight of the organs was also determined.

Table I
Fresh weight of spleen, liver and kidneys of female C3H mice bearing spontaneous mammary carcinoma and of healthy male C3H mice.

	Number of animals	Mean weight in g	Standard error	Range
Controls				
Body weight. .	11	28	± 1·7	21–36
Spleen weight .	11	0·183	± 0·016	0·125–0·269
Liver weight. .	11	1·654	± 0·086	1·243–2·026
Kidney weight .	11	0·548	± 0·047	0·332–0·791
*Tumours**				
Body weight. .	11	30	± 1·3	23–37
Spleen weight .	11	0·540	± 0·041	0·271–0·726
Liver weight. .	11	2·178	± 0·139	1·631–2·871
Kidney weight .	11	0·386	± 0·011	0·340–0·461

* Average tumour weight = 2·5 g.

The C3H mice were females of about 6 months of age all having spontaneous mammary carcinoma. In order to get controls of this strain we were obliged to take C3H males of the same age and body weight. In this series the weight of the kidneys was also determined.

The results are seen in Table I and II. The fresh weight of the spleen in both tumour groups is significantly higher than in the controls, the ratio between cancerous and control mice being 3·7 for the TE mice and 3·0 for the C3H mice. The enlargement of the spleen was proportional to the tumour weight. The corresponding figures for the liver are 1·4 and 1·3. For the dry weights essentially identical ratios were obtained. The weight of the kidneys of the cancerous C3H mice was found to be lower than that of the controls, the ratio being 0·7. When the C3H females were allowed to die spontaneously, the dispersion of the values was greatly increased, some animals were found to have a normal, some even a decreased liver and spleen weight. For these results cachexia was presumably responsible.

Tissue examination revealed no metastases. Histological examination showed the presence of massive infiltrations of plasma cells or lymphocytes in the spleen and periportal infiltrations of plasma cells or lymphocytes in the liver of the cancerous mice (cf. CALO[2]). Our radioiron studies suggest that there must also be an appreciable amount of erythropoietic tissue in the spleen of the cancerous animals (v. EHRENSTEIN[3], see also KELSALL[4] and ANTOPOL *et al.*[5]).

We have also injected healthy male TE mice intraperitoneally under aseptic conditions with 0·25 ml of whole blood of TE mice bearing Ehrlich ascites carcinoma in the solid growing form. The weight of the spleen of the healthy mice, which received the blood of the cancerous animals, was found to be increased to twice that of the controls which were injected intraperitoneally with saline. The weight of the liver and kidneys was not affected in these experiments. Intraperitoneal injection of 0·25 ml of whole blood of healthy mice did not produce splenomegaly.

Intraperitoneal injection of 0·2 ml of blood plasma of cancerous TE mice into healthy TE mice caused spleen enlargement to twice the normal weight as early as 120 h after the injection. Intraperitoneal injection of either 0·2 ml plasma or 0·1 ml packed red blood corpuscles of healthy TE mice, or of 0·1 ml of packed red corpuscles of cancerous TE mice, did not affect the spleen weight.

[1] IRMA MÜLLER, Zbl. allg. Path. path. Anat. *55*, 180 (1932).
[2] A. CALO, Z. Krebsforsch. *37*, 151 (1932).
[3] G. v. EHRENSTEIN, Arkiv Kemi (1958), in press.
[4] M. A. KELSALL, J. nat. Cancer Inst. *10*, 625 (1949).
[5] W. ANTOPOL, S. GLAUBACH, and S. GRAFF, Proc. Amer. Assoc. Cancer Res. *2*, 276 (1958).

Table II

Weight of spleen and liver of male TE mice bearing Ehrlich Ascites Carcinoma growing in the solid form and of healthy male TE mice.

		Number of animals	Mean weight in g	Standard error	Range
Controls					
Body weight		36	32	± 0·5	26–36
Spleen	fresh weight	36	0·122	± 0·007	0·066–0·208
	dry weight	10	0·024	± 0·001	0·018–0·031
Liver	fresh weight	36	1·555	± 0·030	1·053–2·258
	dry weight	10	0·412	± 0·021	0·334–0·538
*Tumours**					
Body weight		33	35	± 0·5	27–40
Spleen	fresh weight	33	0·450	± 0·027	0·124–0·706
	dry weight	11	0·069	± 0·007	0·033–0·100
Liver	fresh weight	33	2·200	± 0·054	1·629–2·775
	dry weight	11	0·544	± 0·020	0·426–0·662

* Average tumour weight = 2·5 g.

These results compare with the findings of CROSSLEY *et al.*[6] in rats.

It is improbable that the enlargement of the spleen caused by intraperitoneal injection of plasma from cancerous mice was produced by an infection in the cancerous animals (cf. ANTOPOL *et al.*[5]). Studies are in progress in this laboratory on this problem.

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Zusammenfassung

Das Milzgewicht karzinomtragender Mäuse ist dreimal so hoch wie das Milzgewicht gesunder Kontrollen.

Die Leber karzinomtragender Mäuse ist ungefähr anderthalbmal so schwer wie die Leber gesunder Kontrollen.

Das Nierengewicht von C3H-Mäusen mit Mammakarzinom beträgt nur etwas mehr als die Hälfte des Nierengewichtes gesunder Kontrollen.

Intraperitoneale Injektion von 0,25 ml Vollblut oder 0,2 ml Plasma von TE-Mäusen mit Ehrlich-Ascites-Karzinom in der solid wachsenden Form erhöht das Milzgewicht gesunder Kontrollen auf das Doppelte.

[6] M. L. CROSSLEY, M. BRUSH, F. JENCKS, and J. B. ALLISON, Proc. Amer. Assoc. Cancer Res. *2*, 11 (1955).

Über die Reaktion der höheren und tieferen Reizbildungszentren des isolierten Herzens auf Temperatursenkung

In der Literatur liegen zahlreiche Angaben vor über einen engen Zusammenhang zwischen Herzfrequenz und Körpertemperatur. Kürzlich wurde von BADEER[1] sogar eine lineare Beziehung zwischen diesen beiden Faktoren im Intervall von 25 bis 40°C beschrieben. Dagegen sind unsere Kenntnisse über die Reaktion der tieferen Reizbildungszentren bei Hypothermie sowie über die gegenseitige Beziehung der temperaturbedingten Aktivitätsänderungen der einzelnen Reizbildungszentren sehr gering.

Zur Klärung dieser Fragen wurde an nach LANGENDORFF isolierten Kaninchenherzen das Hissche Bündel durchtrennt und die Änderungen in der Tätigkeit der Vorhöfe bzw. der Kammern elektrokardiographisch registriert. Die Änderung der Vorhoffrequenz war für die Aktivität des Sinusknotens, die Änderung der Kammerfrequenz für die tertiäre Kammerreizbildung kennzeichnend. Änderungen der atrioventrikulären Reizbildung konnten nach Elektrokoagulation oder nach mechanischer Schädigung des Sinusknotens untersucht werden; die Führung wird nach einem solchen Eingriff durch das atrioventrikuläre Reizbildungszentrum übernommen; die Eigenfrequenz der Vorhöfe kann als Index der atrioventrikulären Reizbildung aufgefasst werden. Einzelheiten der Methodik sind in einer anderen Mitteilung (SZEKERES, FALLER und LICHNER[2]) ausführlich beschrieben worden.

Bei dieser Versuchsanordnung nahm die Aktivität sowohl der homotopen wie auch der heterotopen Reizbildung bei Kühlung der Durchströmungsflüssigkeit deutlich ab. Bei 26°C sank die Kammerfrequenz durchschnittlich auf 40%, die atrioventrikuläre Frequenz auf 31% und die Sinusfrequenz auf 28,3% des bei 38°C beobachteten Ausgangswertes. Die Abbildung veranschaulicht einen solchen Versuch. In der Tabelle sind die Versuche über die Reaktion der einzelnen Reizbildungszentren bei Durchströmung mit Lockelösung von 38°C bzw. 26°C zusammengefasst. Wie ersichtlich, reagiert der Vorhof (Sinusreizbildung) mit der stärksten Frequenzverminderung, die Frequenzabnahme der atrioventrikulären Reizbildung ist bedeutend kleiner und diejenige der Kammern am geringsten. Die Unterschiede in der temperaturbedingten Frequenzabnahme einzelner Reizbildungszentren sind statistisch gut gesichert. Diese Versuchsergebnisse weisen darauf hin, dass die Sinusreizbildung auf Senkung der Temperatur empfindlicher reagiert als die «tertiäre» Kammerreizbildung. Die atrioventrikuläre Reizbildung steht zwischen diesen beiden.

[1] H. BADEER, Amer. J. Physiol. *167*, 76 (1951).

[2] L. SZEKERES, J. FALLER und G. LICHNER, Arch. exp. Path. Pharmak. *233*, 343 (1958).