

The results are shown in the Figure, which, in addition, includes 2 groups studied earlier⁴ namely a control group and a group treated with injections of 48/80 only. In the control group there was no significant difference in the tensile strength between a 5-day-old healing skin incision on one half of the back, compared to an identical incision on the contralateral side ($p > 0.1$). The group pre-treated with antihistamine only did not differ significantly in tensile strength of the control wound ($p > 0.1$). However, the 2 groups pre-treated with 48/80 only or with antihistamine plus 48/80 displayed significantly increased wound tensile strength on HFC-elevating treatment ($0.01 > p > 0.001$).

Discussion. The results with the histamine-liberator show that blood-carried histamine, extracellular histamine, does not affect the healing process, whereas treatment with 48/80 which elevates HFC in the wound tissues enhances wound healing. The ineffectiveness of extracellular histamine on wound healing is also apparent from experiments with long-acting histamine⁵. Likewise, in the pregnant rat the rate of wound healing is not enhanced during the last third of the pregnancy when the histamine generated by the fetuses reach the highest levels^{7,8}. It would appear that the stimulating effect on the healing processes is brought about by histamine newly formed, 'nascent histamine'⁹, in the wound proper.

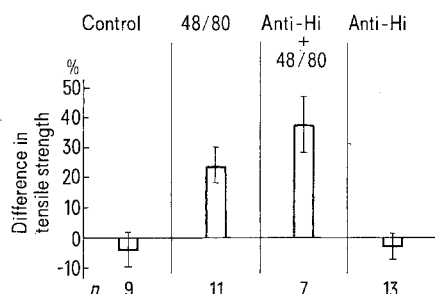
In connection with the present experiments, it should

be recalled that in anaphylaxis histamine is not merely reduced but also newly formed⁹. Antihistamines are not always effective in certain allergic conditions. Mepyramine suppresses some histamine-stimulating effects, e.g. the contraction of the smooth muscles of the bronchi and the gut, and has been defined as an H_1 -receptor antagonist¹⁰. An H_2 -receptor antagonist (burimamide) can antagonize some responses of histamine which cannot be blocked by mepyramine¹¹. The elevated rate of formation of histamine, e.g. in wound tissues of the rat is not affected by pretreatment with mepyramine (SANDBERG, unpublished). An enzyme inhibitor would restrain the elevation of HFC, as shown by SANDBERG and STEINHARDT¹² to occur in the wound tissues under the influence of cortison administration, whereby the rate of healing was found retarded.

Zusammenfassung. Der Effekt der Vorbehandlung mit Antihistamin und Compound 48/80 wurde an heilenden Wunden bei Ratten untersucht. Da die Vorbehandlung die heilungsstimulierende Wirkung des 48/80 nicht veränderte, ist anzunehmen, dass das intrazellulär gebildete Histamin, sowie die Aktivierung der Enzyme für die Beschleunigung des Heilprozesses entscheidend sind.

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Difference in wound tensile strength (T.S.), mean \pm standard error of mean in 4 groups. Number of animals are given. Anti-Hi, antihistamine.

⁷ L. SANDBERG and N. SANDBERG, *Acta otolaryng. Suppl.* 224, 335 (1967).

⁸ G. KAHLSON, *Lancet* 1, 67 (1960).

⁹ G. KAHLSON and E. ROSENGREN, in *Biogenesis and Physiology of Histamine* (Arnold, London 1971).

¹⁰ A. ASH and H. O. SCHILD, *Br. J. Pharmac. Chemother.* 27, 427 (1966).

¹¹ J. W. BLACK, W. A. M. DUNCAN, C. J. DURANT, C. R. GANELLIN and E. M. PARSONS, *Nature, Lond.* 236, 385 (1972).

¹² N. SANDBERG and C. STEINHARDT, *Acta chir. scand.* 127, 446 (1964).

Cytoplasmic Filaments Associated with Lipid Droplets in Chondrocytes of the Rat Auricular Cartilage

The nature of the boundary between the lipid droplet and the surrounding cytoplasm is still an unsolved problem. It is also questionable whether or not the lipid-cytoplasm interface is of the same nature in all cell types which contain lipid in particulate form^{1,2}. LUCKENBILL and COHEN³ and WOOD¹ described a highly ordered complex of fine filaments surrounding the fat droplets in some of the chick adipose cells. The presence of such filaments in mammalian adipose cells could not be confirmed without reserve². The present communication deals with the finding of cytoplasmic filaments around the lipid droplets in chondrocytes of the cartilage in the external ear of the rat.

Small pieces of cartilage dissected from the auricle of adult albino rats were fixed at 4°C for 1–2 h in 1% osmium tetroxide (alone or with 6.25% glutaraldehyde) buffered in 0.06 N cacodylate buffer. The tissue was embedded in Durcupan Fluka, sectioned with glass knives in a Reichert's ultramikrotome, stained with lead citrate and uranyl acetate and examined with the Siemens Elmiskop I.

The elastic cartilage in the external ear of the rat is of cellular type. In the adult tissue, the chondrocytes contain large lipid droplets. In all but the peripheral cells, a single large lipid droplet fills up the cytoplasm to the degree of giving the cell the appearance of a signet-ring like white adipocyte ('Fettknorpel' or adipose cartilage of SCHAFFER⁴). Near the periphery of the cartilaginous plate, the chondrocytes contain one or more lipid droplets of different size. The rest of the cytoplasm is characterized by abundant 60–70 Å thick filaments spaced at intervals of about 60–200 Å. In general, they run in different directions, but there are large areas of cytoplasm, in which all the filaments display a regular

¹ E. M. WOOD, *Anat. Rec.* 157, 437 (1967).

² B. G. SLAVIN, *Int. Rev. Cytol.* 33, 297 (1972).

³ L. M. LUCKENBILL and A. S. COHEN, *J. Cell. Biol.* 31, 195 (1966).

⁴ J. SCHAFFER, in *Handbuch der mikroskopischen Anatomie des Menschen* (Ed. W. v. MÖLLENDORFF; Julius Springer, Berlin 1930), vol. II/2, p. 234.



Fig. 1. Part of a peripheral chondrocyte which contains a medium-sized lipid droplet (LD). Cytoplasmic filaments (F) are visible predominantly in transverse section. $\times 26,500$.

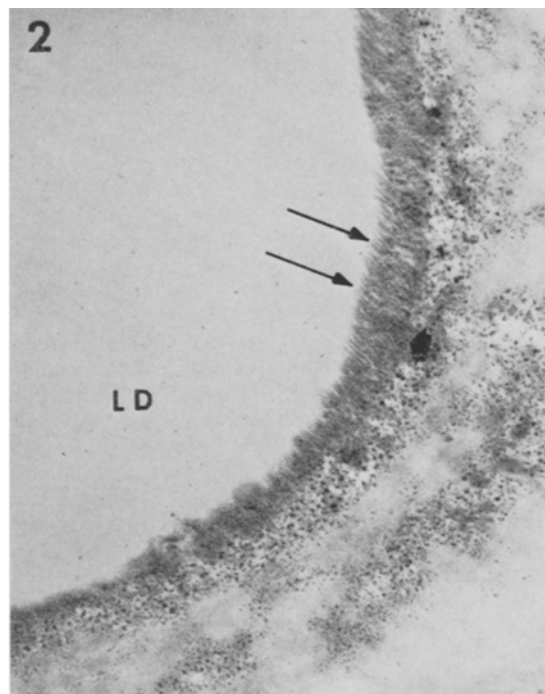


Fig. 2. Periphery of a large, univacuolar central chondrocyte. The large lipid droplet (LD) is surrounded by densely packed parallel filaments (thin arrows). The short thick arrow points to the outer cell membrane. Right and below: intercellular material. $\times 28,000$.

parallel arrangement (Figure 1). They are distributed all around the nucleus, between the nucleus and the lipid droplet, and around the lipid droplet itself. The close relationship of filaments to the lipid droplet can best be discerned in mature univacuolar chondrocytes, which make up the central part of the cartilaginous plate. The thin rim of cytoplasm, which surrounds the lipid droplet, is largely occupied by densely packed filaments. Their uniform, parallel arrangement is clearly visible in areas in which the periphery of the weakly osmiophilic lipid droplet is sectioned tangentially (Figure 2).

The findings described are similar to observations of LUCKENBILL and COHEN³ and WOOD⁴ in chick subsynovial and developing bone marrow adipose cells respectively, with the exception that the orthogonal pattern of distribution of filaments was not observed in our material.

The significance of the close association of cytoplasmic filaments with the intracytoplasmic lipid droplets remains obscure. This relationship is sometimes described

as an almost common feature in adipose cells⁵, but it must be pointed out that this statement is based only on sporadic observations on differently located adipose cells, predominantly in the chick¹⁻³. The abundance of cytoplasmic filaments in the cytoplasm of rat auricular chondrocytes has been described, but their relationship to the lipid droplet was not mentioned⁶. Further systematic investigation is needed in order to cast more light on this problem. The observations described above on the rat auricular chondrocytes suggest that the presence of abundant cytoplasmic filaments is principally related to the mechanical role of the tissue rather than to the presence of lipid droplets within the cytoplasm.

Zusammenfassung. Im Ohrknorpel der Ratte werden feine, intracytoplasmatische, 60–70 Å dicke Filamente beobachtet, welche, parallel zueinander angeordnet, die Oberfläche der in den Knorpelzellen enthaltenen Fetttröpfchen überziehen.

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⁵ W. BLOOM and D. W. FAWCETT, *A Textbook of Histology*, 9th edn. (W. B. Saunders Co., Philadelphia, London, Toronto 1970).

⁶ A. SERAFINI-FRACASSINI and J. W. SMITH, *The Structure and Biochemistry of Cartilage* (Churchill Livingstone, Edinburgh and London 1974).

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cAMP-Mediated Regulation of the Permeability in the Brain Capillaries

In view of the powerful impact exerted by some substances upon the functioning of the central nervous system, the recognition of those cellular mechanisms which regulate the transport in capillaries from blood circulation towards the brain would be of utmost importance. Recent results, obtained by studying the

distribution of exogenous peroxidase¹, and the capillary ultrastructure after adenosine triphosphatase inhibition²,

¹ T. S. BODENHEIMER and M. W. BRIGHTMANN, *Am. J. Anat.* 122, 249 (1968).

² F. Joó, *Nature, Lond.* 219, 1378 (1968).