found in significant amounts, and some polyunsaturated acids ($C_{16:2}$ acid, 2.2mol/100mol; $C_{16:3}$ acid, 2.8mol/100mol) were detected. Triacylglycerols from the blubber contained 4.2mol of isovalerate/100mol and 0.9mol of long-chain iso acids/100mol, together with large amounts of straight-chain mono-unsaturated acids ($C_{14:1}$ acid, 2.5mol/100mol; $C_{16:1}$ acid, 22.9mol/100mol; $C_{18:1}$ acid, 23.9mol/100mol; $C_{20:1}$ acid, 12.5mol/100mol; $C_{22:1}$ acid, 4.6mol/100mol) and polyunsaturated acids ($C_{18:2}$ acid, 1.1mol/100mol; $C_{20:5}$ acid, 4.8mol/100mol; $C_{22:5}$ acid, 2.2mol/100mol; $C_{22:6}$ acid, 4.1mol/100mol.).

The triacylglycerols from the acoustic tissues contained 66.0% of structures comprising 2mol of isovalerate and 1mol of long-chain acid/mol. The diisovaleroyl glycerides were not found in the blubber. Thus the findings strengthen the hypothesis (Varanasi & Malins, 1972) that di-isovaleroyl glycerides are intimately involved in the biosonar of marine cetaceans. Further, the lipid structural requirements for acoustic tissues now appear to be similar for marine cetaceans from both warm and very cold waters.

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The Effect of Local Anaesthetics on Lipolysis in Fat-Cells

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Local anaesthetics are inhibitors of hormone-stimulated lipolysis in rat fat-cells, the most potent being dibucaine (Hales, 1970). The amount of inhibition does not depend on the lipolytic stimulus. With a cell concentration of 55mg dry wt./ml 1mM-dibucaine gave 88% inhibition of lipolysis stimulated by adrenaline (10 μ g/ml), theophylline (1mM) or both together. The effect is reversed by washing the cells. Similar concentrations of dibucaine have little effect on insulin- or adrenaline-stimulated glucose uptake.

Since the action of lipolytic hormones is thought to be mediated by adenylate cyclase, the effect of dibucaine on the concentration of cyclic AMP (adenosine 3':5'-cyclic monophosphate) was in-

vestigated. When the cell content of cyclic AMP was raised by adrenaline, theophylline or the two combined, the addition of 1mM-dibucaine caused still greater accumulation of cyclic AMP in both cells and incubation medium.

To test the possibility that dibucaine inhibited the lipase, it was added to cells sonicated after lipase activation by adrenaline. At 4mM dibucaine completely inhibited the adrenaline effect in whole cells, but only partially in the sonicated cells. It was concluded that the main effect of dibucaine is not on adenylate cyclase or the lipase.

Local anaesthetics may interfere with activation of lipolysis by preventing production of an activating factor other than cyclic AMP. The lipase cannot be activated in cell-free systems to a degree comparable with that in whole cells (Hales *et al.*, 1968), even with added protein kinase (Huttunen & Steinberg, 1971). Ionic changes may be necessary for maximum lipase activation. The potencies of various local anaesthetics as lipolytic inhibitors parallel their anaesthetic potencies, and therefore their ability to interfere with ion movements. Ca^{2+} activates the analogous phosphorylase system in muscle (Ozawa & Ebashi, 1967), and the general relationship of Ca^{2+} to the action of cyclic AMP has been discussed (Rasmussen, 1969). Local anaesthetics inhibit Ca^{2+} release from sarcoplasmic reticulum (Johnson & Inesi, 1969). We therefore suggest that hormonal stimulation of lipolysis in adipose tissue requires increased availability of Ca^{2+} for activation of the lipase system, and that local anaesthetics inhibit the stimulation by preventing the necessary movement of Ca^{2+} .

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