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The Oxidation of Glutathione by a Preparation of Glucose Oxidase from *Aspergillus niger*

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A commercial preparation of glucose oxidase from *Aspergillus niger* (Fermcozyme 653 AM, lot no. 1917; Hughes and Hughes Ltd., Romford, Essex, U.K.) catalyses the reaction:

The catalytic activity is unaffected by dialysis or the presence of 50 mM-EDTA, but is abolished by heating at 90°C for 10 min.

Measurements with an oxygen electrode show that in phosphate-citrate buffer, pH 5.6 (20 mM- Na_2HPO_4), containing 1.6% (v/v) of Fermcozyme, 50 mM-EDTA and 0.005% (w/v) of catalase, 0.25 mol of O_2 is consumed/mol of GSH added. The concomitant disappearance of free thiol can be demonstrated by using 5,5'-dithiobis-(2-nitrobenzoate) (Roberts & Agar, 1971). All the added GSH is recoverable as GSSG, as assayed by a modification of the method of Srivastava & Beutler (1968). The evidence for H_2O_2 as another reaction product is that in the presence of Fermcozyme and peroxidase GSH oxidizes gum guaiacum to a blue compound, the maximum extinction at 610 nm being 40% of that given by an equimolar amount of glucose. These findings are consistent with the equation given above.

The apparent Michaelis-Menten parameters of Fermcozyme for GSH, estimated by the procedure of Wilkinson (1961) from initial rates of O_2 uptake in the presence of excess of catalase and 50 mM-EDTA at pH 5.6, 37°C and about 230 μM - O_2 , are: $K_m = 0.97 \pm 0.04$ (10 mM; $V = 16.3 \pm 0.3$ (10) μmol of O_2 /min per ml of Fermcozyme. In these conditions, the rate of O_2 uptake with 5 mM-cysteine is less than 10% of that with an equimolar concentration of GSH.

When Fermcozyme is saturated with glucose (110 mM) or GSH (5 mM), the ratio v (glucose)/ v (GSH) is 11. The corresponding ratio for a purer preparation of glucose oxidase from *Aspergillus niger* (Glucose Oxidase 250, lot no. 6X; Hughes and

Hughes Ltd.) is 440. Therefore Fermcozyme may contain an enzyme that oxidizes GSH and is not glucose oxidase.

One implication of our finding that may be of practical importance is that, when glucose in the diffusate from a typical haemolysate is measured by using Fermcozyme-peroxidase-gum guaiacum, the GSH also present raises the estimate by about 5%.

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Differences in Triacylglycerols from Acoustic Tissues and Posterior Cranial Blubber of the Narwhal (*Monodon monoceros*)

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Acoustic tissues of the porpoises *Phocoena phocoena* (Varanasi & Malins, 1970b) and *Tursiops gilli* (Varanasi & Malins, 1970a), as well as the Beluga whale (*Delphinapterus leucas*) (Litchfield *et al.*, 1971), contain large amounts of isovalerate (3-methylbutyrate) and long-chain saturated iso acids. However, cranial blubber of *T. gilli*, having no acoustic function, comprises primarily acids characteristic of normal mammalian adipose tissues (Varanasi & Malins, 1971). Moreover, in *T. gilli* large amounts of di-isovaleroyl glycerides in acoustic tissues appear to play a vital role in sound transmission (Varanasi & Malins, 1972).

We analysed in the narwhal (*Monodon monoceros*), an unusual Arctic whale, the triacylglycerols from acoustic tissues at the attachment point of the mandibular waveguide to the bulla. Comparisons were made with triacylglycerols from non-acoustic posterior cranial blubber.

The acoustic tissues and blubber each contained 94.5% of lipid comprised of 82.2% and 85.5% of triacylglycerols respectively. The triacylglycerols were separated and purified, and component acids were analysed by g.l.c. (Varanasi & Malins, 1970b). Triacylglycerols from the acoustic tissues comprised 47.8 mol of isovalerate/100 mol and 18.7 mol of long-chain iso acids (isopentadecanoate, 11.4 mol/100 mol, was the major component)/100 mol. Moreover, straight-chain monounsaturated acids ($\text{C}_{16:1}$ acid, 10.4 mol/100 mol; $\text{C}_{18:1}$ acid, 2.2 mol/100 mol) were