diluted 20-fold, ionic strength maintained with NaCl, 0.18; without CuSO₄, 0.04.

The constancy of the rate for an hour suggests that a steady state prevailed and that formation of the aldimine chelate (studied by Farago & Matthews, 1969) was not rate-limiting. Acetate therefore accelerates transamination, probably by catalysing aldimine-ketimine conversion. Martell & Matsushima (1968) ascribed a similar role to carboxylate ions in methanol.

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- Banks, B. E. C., Diamantis, A. A. & Vernon, C. A. (1961). *J. chem. Soc.* p. 4235.
 Braunstein, A. E. & Shemyakin, M. M. (1953). *Biokhimiya*, **18**, 393.
 Bruice, T. C. & Topping, R. M. (1963a). *J. Amer. chem. Soc.* **85**, 1480.
 Bruice, T. C. & Topping, R. M. (1963b). *J. Amer. chem. Soc.* **85**, 1488.
 Dixon, H. B. F. (1964). *Biochem. J.* **92**, 661.
 Dixon, H. B. F. (1967). *Biochem. J.* **103**, 38p.
 Dixon, H. B. F. (1968). In *Pyridoxal Catalysis*, p. 99. Ed. by Snell, E. E., Braunstein, A. E., Severin, E. S. & Torchinsky, Yu. M. New York: Interscience Publishers Inc.
 Farago, M. E. & Matthews, T. (1969). *J. chem. Soc. (A)*, p. 609.
 Martell, A. E. & Matsushima, Y. (1968). In *Pyridoxal Catalysis*, p. 33. Ed. by Snell, E. E., Braunstein, A. E., Severin, E. S. & Torchinsky, Yu. M. New York: Interscience Publishers Inc.
 Metzler, D. E., Ikawa, M. & Snell, E. E. (1954). *J. Amer. chem. Soc.* **76**, 648.
 Mix, H. & Willeke, F. (1960). *Hoppe-Seyl. Z.* **318**, 148.

Stabilization and Partial Purification of Lipoprotein Lipase

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Lipoprotein lipase is thought to be an important factor in the transport of triglyceride fatty acids from the blood stream into extrahepatic tissue (see, e.g., Garfinkel, Baker & Schotz, 1967). An outstanding feature of this enzyme is its instability in rat adipose tissue (Wing & Robinson, 1968) and adipose-tissue extracts, i.e. in media containing heparin in which adipose tissue has been incubated (Cherkes & Gordon, 1959) and in ammoniacal extracts from acetone-dried powder of adipose tissue (Wing, Salaman & Robinson, 1966). The importance of this instability in relation to regulation of enzyme activity has been stressed by Cunningham & Robinson (1969).

The instability of aqueous lipoprotein lipase pre-

parations has made more detailed studies of the enzyme difficult. It has now been found that lipoprotein lipase from acetone-dried powder of adipose tissue from fed rats can be stabilized by an artificial triglyceride emulsion (Prosparol; Duncan, Flockhart and Evans Ltd.). Extracts of acetone-dried powder of adipose tissue containing 1–2 mg. of protein/ml. were incubated in the presence of sonicated Prosparol (0.5% triglyceride concentration) and samples were tested for lipoprotein lipase activity at appropriate time-intervals; serum-activated triglyceride emulsion (Korn & Quigley, 1957) was used as substrate. Confirmation that the enzyme under investigation was lipoprotein lipase was obtained by parallel assay of the hydrolysis of non-activated triglyceride emulsion and the inhibition of the hydrolysis of activated substrate by 0.5M-NaCl. The enzyme-Prosparol preparation lost no activity in 3 hr. and less than 20% in 24 hr. at 25°. At 37° the loss in activity during the 3 hr. was 25%. Neither glycerol monostearate nor polyoxyethylene monostearate at the concentrations present in Prosparol stabilized the enzyme when used separately.

Heparin at concentrations that mobilize lipoprotein lipase from adipose tissue abolished the stabilizing action of Prosparol. Thus at 3 units/ml. the activity of the preparations was decreased by more than 60% in 1 hr. of incubation at 37°; at 0.25 unit/ml. the stabilizing action of Prosparol was suppressed even in the presence of 2% triglyceride emulsion.

The affinity of post-heparin blood lipoprotein lipase (clearing factor) to chylomicra is well known and has been used as a means of enzyme enrichment (Anfinson & Quigley, 1953). The remarkable stability of adipose-tissue lipoprotein lipase-Prosparol preparation at room temperature permits purification on Sephadex G-200. So far an increase in specific activity of one order of magnitude has been achieved; the enzyme could be separated in part from most of the α -naphthyl acetate-splitting esterases and to a smaller degree from the monoglyceride lipase (Vaughan, Berger & Steinberg, 1964) present in acetone-dried powder of adipose tissue.

- Anfinson, C. B. & Quigley, T. W. (1953). *Circulation*, **8**, 435.
 Cherkes, A. & Gordon, R. S. (1959). *J. Lipid Res.* **1**, 97.
 Cunningham, V. J. & Robinson, D. S. (1969). *Biochem. J.* **112**, 203.
 Garfinkel, A. S., Baker, N. & Schotz, M. C. (1967). *J. Lipid Res.* **8**, 274.
 Korn, E. D. & Quigley, T. W. (1957). *J. biol. Chem.* **226**, 833.
 Vaughan, M., Berger, J. E. & Steinberg, D. (1964). *J. biol. Chem.* **239**, 401.
 Wing, D. R. & Robinson, D. S. (1968). *Biochem. J.* **106**, 667.
 Wing, D. R., Salaman, M. R. & Robinson, D. S. (1966). *Biochem. J.* **99**, 648.