

for the unfolding of certain regions of the secondary structure. It will appear that this interpretation places emphasis on the importance of the postulated tyrosyl-carboxylate linkage in stabilizing significant areas of the secondary structure<sup>8,9</sup>. We may infer that such a stabilizing bridge could be important in other proteins such as serum albumin<sup>10</sup>, lysozyme<sup>11</sup>, and ribonuclease<sup>12</sup> where non-ionizing phenolic hydroxyl groups have been demonstrated in the native protein.

A detailed report of this work will appear later in *Comptes rend. trav. lab. Carlsberg, Série chim.*

The author wishes to acknowledge his indebtedness to Professor LINDERSTRÖM-LANG and to M. OTTESEN for many helpful discussions.

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<sup>1</sup> R. B. SIMPSON AND W. KAUFMANN, *J. Am. Chem. Soc.*, 75 (1953) 5139.

<sup>2</sup> J. SCHELLMAN, R. B. SIMPSON AND W. KAUFMANN, *J. Am. Chem. Soc.*, 75 (1953) 5152.

<sup>3</sup> H. K. FRENSDORFF, M. T. WATSON AND W. KAUFMANN, *J. Am. Chem. Soc.*, 75 (1953) 5157.

<sup>4</sup> C. F. JACOBSEN AND J. LÉONIS, *Compt. rend. trav. lab. Carlsberg, Sér. chim.*, 27 (1949-1951) 14, 333.

<sup>5</sup> J. STEINHARDT AND E. M. ZAISER, *J. Biol. Chem.*, 190 (1951) 197.

<sup>6</sup> The JACOBSEN-LÉONIS recording auto-titrator has also been used in a study of the alkaline denaturation of Tobacco mosaic virus.

W. F. HARRINGTON, A. L. LEVY AND H. K. SCHACHMAN (to be published).

<sup>7</sup> R. K. CANNAN, A. C. KIBRICK AND A. H. PALMER, *Ann. N.Y. Acad. Sci.*, 41 (1941) 243.

<sup>8</sup> J. L. CRAMMER AND A. NEUBERGER, *Biochem. J.*, 37 (1943) 302.

<sup>9</sup> A. E. MIRSKY AND L. PAULING, *Proc. Nat. Acad. Sci.*, 22 (1936) 439.

<sup>10</sup> C. TANFORD AND G. L. ROBERTS, *J. Am. Chem. Soc.*, 74 (1952) 2509.

<sup>11</sup> C. TANFORD AND M. L. WAGNER, *J. Am. Chem. Soc.*, 76 (1954) 3331.

<sup>12</sup> D. SHUGAR, *Biochem. J.*, 52 (1952) 142.

Received August 29th, 1955

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## Early changes of myosin in vitamin E-deficient rabbits

The early onset of creatinuria in animals with nutritional muscular dystrophy has been explained as being due to incapacity of muscle to retain creatin after incorporation from the blood stream<sup>1,2</sup>. On the other hand, MENNE<sup>3</sup> reported experiments indicating that myosin acts as an apo-enzyme in creatine synthesis from arginine, histidine and choline. Similar evidence is shown by the recent experiments of NEKHOROCHEFF<sup>4</sup>.

Researches in our laboratory on contractile muscle proteins in vitamin E-deficiency show very early myosin alterations in this condition which are probably in strict connection with the onset of creatinuria.

Rabbits were fed on Houchin and Mattill diet. Myosin was prepared according to Mommaerts and Parrish procedure. We began to study the biochemical properties of myosin of these rabbits after the first week of diet (8th and 11th day), when histological findings and polarized microscopy are completely negative.

Even during the myosin preparation we had already observed that after a longer period of diet (2 weeks), a large part of the myosin precipitated at 0.28 M KCl. Starting from rabbits kept for one week on diet, myosin precipitation curves were carried out at variable KCl concentrations and it was observed that dystrophic myosin very early loses its full solubility at 0.1 M KCl, pH 6.8, while normal myosin shows a sharp increase in solubility from 0.05 to 0.1 M KCl. Viscosity measurements, carried out with an Ostwald viscosimeter at 0°C, show a decrease in  $Z_{11}$  values from 0.2, which is the normal value for myosin, down to 0.13.

More detailed accounts of the present experiments will be published elsewhere.

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<sup>1</sup> F. VERZAR, *Schweiz. Med. Wochschr.*, 11 (1939) 738.

<sup>2</sup> F. VERZAR, *Z. Vitaminforsch.*, 9 (1939) 242.

<sup>3</sup> F. MENNE, *Z. exp. Med.*, 112 (1943) 38.

<sup>4</sup> J. NEKHOROCHEFF, *Bull. soc. chim. biol.*, 36 (1954) 885.

Received September 2nd, 1955