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Metabolism of N-Alkyl Derivatives of Amino Acids.

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The metabolism of certain N-alkyl derivatives of phenylalanine, valine, leucine, and isoleucine has been studied by the methods of Rose and coworkers.[1] Young white rats were fed an adequate diet containing carbohydrate, fat, inorganic salts, vitamins, and a mixture of purified amino acids. In the diets of the experimental animals the amino acid being studied was replaced by varying amounts of the corresponding N-alkyl derivatives. The growth of the rats was followed over a 28-day period.

The results of these studies are shown in Table I.

These data and the results of other investigators with the N-alkyl derivatives of histidine,[2] tryptophane,[3, 4, 5] methionine,[6] lysine,[7] and cystine[8] may be summarized as follows:

1. The N-methyl derivatives of the *d*- forms of the essential amino acids are not utilized by the white rat for growth purposes.

2. With the exception of cystine the N-methyl derivative of the *l*- form of the amino acid has the same nutritive value as the corresponding unmethylated *d*- form. Thus both the *d*- form[1] and the N-methyl derivative of the *l*- form of phenylalanine, methionine, tryptophane, and histidine support growth; while the *d*- form,[1] and

TABLE I.

N-Alkyl Amino Acid	Supports Growth
N-methyl-*d*-phenylalanine	—
N-methyl-*l*-phenylalanine	+
N-ethyl-*dl*-phenylalanine	—
N,N-dimethyl-*dl*-phenylalanine	—
N-methyl-*dl*-valine	—
N-methyl-*dl*-leucine	—
N-methyl-*dl*-isoleucine	—

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2 Fishman, J. B., and White, A., *J. Biol. Chem.*, 1936, **113**, 175.

3 Gordon, W. G., and Jackson, R. J., *J. Biol. Chem.*, 1935, **110**, 151.

4 Gordon, W. G., *J. Biol. Chem.*, 1938, **123**, xliii.

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6 Patterson, W. I., Dyer, H. M., and du Vigneaud, V., *J. Biol. Chem.*, 1936, **116**, 277.

7 Gordon, W. G., *J. Biol. Chem.*, 1939, **127**, 487.

8 Kies, M., Dyer, H. M., and du Vigneaud, V., *J. Biol. Chem.*, 1939, **128**, 207.

the N-methyl derivative of the *l*- form of lysine, valine, leucine, and isoleucine fail to do so. It is interesting to note that whereas the N-methyl derivative of *l*-phenylalanine is utilized by the rat neither the N-ethyl nor the N,N-dimethyl derivative supports growth.

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Serological Classification of *C. diphtheriae.*

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The recent introduction of the serological classification of *beta* hemolytic streptococci by Griffith[1] has helped greatly the epidemiological studies of scarlet fever.[1, 2, 3] Classification of *C. diphtheriæ* has been found of similar value by Durand and Guerin,[4] and Eagleton and Baxter.[5] The former described 5 distinct agglutinable types and the latter, 10. No standard serological classification, however, has as yet been universally adopted. Recently, Robinson and Peeney[6] working with *gravis* strains distinguished 5 serological types among this group.

The tube method of agglutination was employed by previous workers. In dealing with the large number of cultures which an epidemiological study will necessarily involve, the tube-method would be time-consuming and a relatively large amount of material would be required. Besides, technical difficulties, such as rapidly settling cultures, autoagglutinable and granular strains may frequently be encountered. To obviate some of these difficulties, we have made use of the slide-agglutination technic as introduced by Coca[7] for cholera examination, and later utilized by Krumwiede[8, 9] for the identification of meningococcus and typhoid-paratyphoid organisms, and by Griffith[1] for the serological classification of *beta* hemolytic

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2 Swift, H. F., Lancefield, R. C., and Goodner, K., *Am. J. M. Sc.*, 1935, **190**, 445.
3 Wu, C. J., and Sia, R. H. P., *Chinese Med. J.*, 1939, **55**, 150.
4 Durand, P., and Guerin, J., *C. R. Soc. biol.*, 1921, **84**, 980.
5 Eagleton, A. J., and Baxter, E. M., *J. Hyg.*, 1923, **22**, 107.
6 Robinson, D. T., and Peeney, A. L. P., *J. Path.*, 1936, **43**, 403.
7 Coca, A. F., *Bull. Manila Med. Soc.*, 1910, **2**, No. 1.
8 Krumwiede, C., *J. A. M. A.*, 1917, **69**, 358.
9 Krumwiede, C., *J. Inf. Dis.*, 1918, **23**, 275.