

The results obtained with orotic acid as a precursor for pyrimidines are compared with those obtained with glycine as a precursor.

Some supplementary experiments are made with the purines from the spleen and kidney of the rat with N<sup>15</sup>-glycine, with the object of investigating the possibility of using adenine as a precursor for guanine.

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### Short Communications

#### Pyrimidine Nucleosides as Precursors of Ribonucleic Acid (PNA) Pyrimidines

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It has been shown with the aid of N<sup>15</sup> that the free pyrimidines uracil, thymine<sup>1</sup> and cytosine<sup>2</sup> cannot be utilized as pre-

cursors for polynucleotides by the rat. This does, however, not necessarily mean that these bases when bound as nucleosides or nucleotides cannot enter polynucleotides. The finding of Loring and Pierce<sup>3</sup> that pyrimidine ribonucleosides and nucleotides are from 10 to 60 times as active as free pyrimidines for a pyrimidine deficient strain of *Neurospora* strongly suggests the necessity of trying tracer marked nucleosides or nucleotides as precursors for polynucleotides.

Because of that we have grown yeast on a medium in which the nitrogen source of

the yeast contained  $N^{15}$ . The biologically marked PNA was isolated from the yeast according to the method of Hammarsten <sup>4</sup>. Cytidine and uridine were prepared from the PNA according to the method of Reichard <sup>5</sup>. The  $N^{15}$ -nucleosides after some dilution with non isotopic material were injected into rats at a level of 80 mg per kilo of body weight per day for 3 days. After that time the rats were killed, the polynucleotides from the pooled internal organs prepared and separated <sup>4</sup>, the ribonucleosides isolated <sup>5</sup> from the PNA and analyzed for  $N^{15}$ . The results may be seen from Table 1.

Obviously the injected cytidine-N enters the PNA in a comparatively low dilution while uridine is active to a much lesser degree. The injected cytidine is not only a precursor for the cytidine of the PNA but also for uridine. A detailed report will be published later.

Table 1.

Nucleoside injected	Cytidine injection		Uridine injection	
	Atom % excess $N^{15}$	Calc. on basis of 100 % $N^{15}$ in cytidine injected	Atom % excess $N^{15}$	Calc. on basis of 100 % $N^{15}$ in uridine injected
Nucleoside injected	6.43		11.20	
<i>Isolated:</i>				
Mixed polynucleotides	0.102	1.59	0.024	0.21
Uridine	0.385	5.99	0.047	0.42
Cytidine	0.463	7.20	0.053	0.47
Protein	0.006	0.1	0.012	0.1

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## New Books

Niels Bjerrum. *Selected papers*. Edited by friends and coworkers on the occasion of his 70th birthday the 11th of March 1949. Einar Munksgaard, Copenhagen, 1949. 295 pp. 18 Danish Crowns.

A review of this tribute to one of the most outstanding chemists of this century can most adequately be commenced by quoting the book's introduction, written by Niels Bohr, acting chairman of the editorial committee.

«The scientific publications of Niels Bjerrum have initiated great advances of our knowledge and understanding in many fields of chemistry and physics and bear throughout witness of that same openness of outlook and balance of judgment, which his friends and colleagues admire so highly and which together with his straight

forwardness and loyalty has secured him the confidence of the whole Danish community. Many important tasks have been entrusted upon him, and his fertile activities and the encouragement he has given to wide circles will be remembered with deep gratitude from most different sides on his 70th birthday. Deliberating how his colleagues best could contribute on this occasion, the committee has thought that an edition of a selection of the papers of Niels Bjerrum by which he has erected himself a lasting monument in science, would be the most fitting way to express the indebtedness we owe to him, and we feel assured one which will be warmly welcomed by chemists and physicists all over the world.»

A reviewer must agree most emphatically with this statement. More especially