

## Short Communications

On the Mechanism of Ribose  
Synthesis in the Rat

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The major metabolic pathway to ribose has previously been considered to be a more direct conversion from hexoses<sup>1-3</sup>. Recently, however, it has been proposed that the synthesis of ribose proceeds instead over two- and three-carbon units<sup>4</sup>. This theory is supported by an investigation by Bernstein<sup>5</sup> in which chicks were fed with sodium acetate containing C<sup>14</sup> in the carboxyl group. A comparison of the isotope content in the different carbon atoms of glycogen and of ribose indicated that a direct conversion of hexose to ribose is not the major synthetic pathway.

In connection with this it is of interest to report certain experiments performed in this laboratory in which acetate labeled with C<sup>14</sup> in the carboxyl group and with C<sup>13</sup> in the methyl group was administered to rats.

Ten rats were injected intraperitoneally with two mM of labeled acetate per 100 g body weight. This was divided into four doses given at three hours intervals. The animals were sacrificed two hours after the last injection, and the liver and intestines dried immediately with alcohol and ether. The polynucleotides were prepared according to Hammarsten<sup>6</sup>. The ribose from

ribonucleic acid was converted to furoic acid as described earlier<sup>7</sup>. The carbon was isolated as barium carbonate; the activity was measured in a Geiger-Müller counter and the excess of C<sup>13</sup> determined in a mass spectrometer. The results can be seen in the table.

	Atom % excess C <sup>13</sup>	Counts per min C <sup>14</sup>
Acetate injected	14.5	30 000
Furoic acid isolated	0.15	60

These values show that the carbon from the methyl group of acetic acid is incorporated into ribose to a much greater extent than is the carbon from the carboxyl group (dilution of C<sup>13</sup> from methyl one-fifth that of C<sup>14</sup> from carboxyl). This might indicate that acetate is not incorporated into ribose as an intact molecule and is, therefore, not an immediate precursor, but may enter the ribose by some indirect route.

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