TECHNICAL PAPERS

Synthesis of Tyrosine Labeled With C^{14}

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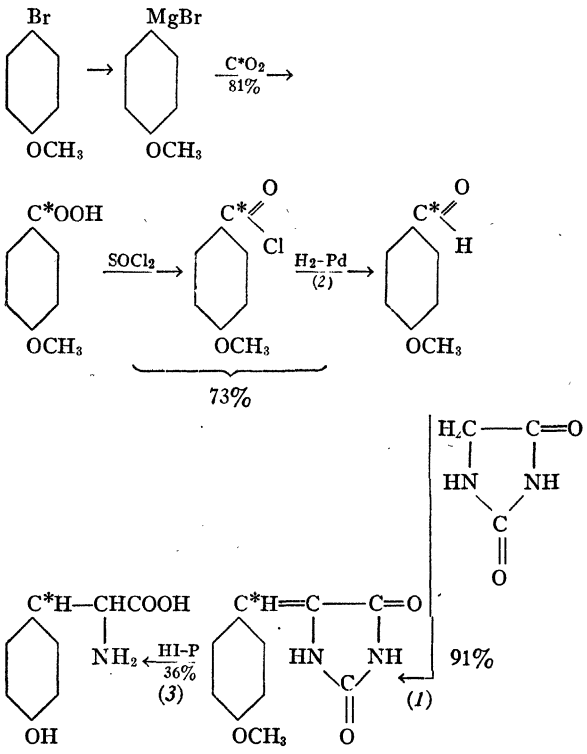
The synthesis of dl-tyrosine labeled with C^{14} in the beta position has been carried out in this laboratory. A summary of the synthesis is herewith presented:



The yield was 177 mg. from 1.03 gram of barium carbonate. This is a yield of 19 per cent, based on barium carbonate.

The yield on the last step was less than half that reported by Wheeler and Hofmann. Further work should raise this considerably.

The Grignard carbonation gave yields as high as 89 per cent in trial runs.

The specific activity of the tyrosine was 0.9 microcuries/mg.

References

1. BOYD, W. J., and ROBSON, W. *Biochem. J.*, 1935, **29**, 545.
2. CASON, J. *Organic syntheses*. (Vol. 21.) New York: John Wiley, 1941. P. 84.
3. WHEELER, H. L., and HOFMANN, C. *Amer. chem. J.*, 1911, **45**, 376.

Chromatolytic Effect of Cerebrospinal Fluid Following Cerebral Concussion

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Following cerebral concussion, the cerebrospinal fluid (CSF) is able to split nucleic acids, as shown spectrophotometrically by a decrease of their selective absorption in ultraviolet light (*1*). This finding was interpreted as due to the appearance of enzymatic substances in the CSF. It seemed of interest to ascertain whether such substances diffusing into the subarachnoid space after concussion are also able to act upon nuclear substances within nerve cells, in particular their tigroid bodies. The CSF's under study were incubated with deparaffinized paraffin sections from normal spinal cords for from 4 to 5 hours at 37° C. and then stained by the Nissl method (preferably with thionine blue). Preliminary experiments showed that on incubation of spinal cord sections with normal CSF or with Ringer's solution, these fluids must be acidified if one wishes to demonstrate Nissl bodies. Therefore, as a rule, 0.05 cc. molar acetate buffer solution with a pH of 4.05 was added to 0.45 cc. cerebrospinal fluid before incubation, so that less than 0.5 cc. CSF is sufficient for this test. While incubation of such acidified normal CSF or Ringer's solution for 4–5 hours at 37° C. with sections of a normal cat's cord leaves most Nissl bodies of the motor cells intact, some CSF's of patients with concussion were able to produce definite tigrolysis (dissolution of the Nissl bodies) in the anterior horn cells under identical conditions. In a parallel study, the effect of these CSF's upon nucleic acids was studied by spectrophotometry in ultraviolet light, and it was found that the CSF's producing tigrolysis were able to decrease markedly the selective absorption of nucleic acids, while those which left the anterior horn cells intact did not affect the nucleic acid samples or only slightly. Thus, the histochemical method and the spectrography confirmed each other.

The demonstration in the CSF of concussed patients of substances able to produce dissolution or a breakdown of Nissl bodies seems of interest for various reasons. From a clinical as well as a medicolegal point of view, the demonstration of changes in the CSF following cerebral concussion may be of value, particularly when other objective signs of damage of nerve cells are scarce or lacking. These findings may also shed some light upon the pathological changes developing in the brain after a blow to the head. If enzymatic substances diffuse from the central nervous system into the CSF, it seems reasonable to suspect that such substances play an important role in the genesis of the chromatolytic changes occurring *in vivo* following concussion.

Reference

1. SPIEGEL ADOLF, M., WYCIS, H. T., and SPIEGEL, E. *Fed. Proc.*, 1946, **5**, 156.