We have now prepared crystalline samples of the 4-, 5-, 6-, and 7-hydroxyskatoles by the hydrogenation of the corresponding benzyloxygramines in the presence of a 10% palladium on charcoal catalyst. The melting point for the 6-hydroxyskatole obtained by this method was 11–13° higher than that reported by HORNING et al.[4]. However, the O-methyl ether has been prepared and has the same melting point (125°) as that previously reported by BLAIKIE and PERKIN for 6-methoxyskatole[7].

The following experimental procedure was employed in all cases: A solution of the benzyloxygramine[8] (200 mg) in methanol (100 ml) was shaken overnight with hydrogen (60 lb./sq.inch) at room temperature in the presence of a 10% palladium on charcoal catalyst (ca. 70 mg)[10]. The reaction mixture was filtered; after removal of the solvent, the resulting crude hydroxyskatole was purified by recrystallisation from a suitable solvent or chromatographically on a silica-gel[11] column. All operations were carried out in an inert atmosphere. The properties of the compounds prepared and the method of purification are given in the Table[12].

Zusammenfassung. Synthesen und Eigenschaften von 4-, 5-, 6- und 7-Hydroxyskatol werden beschrieben.

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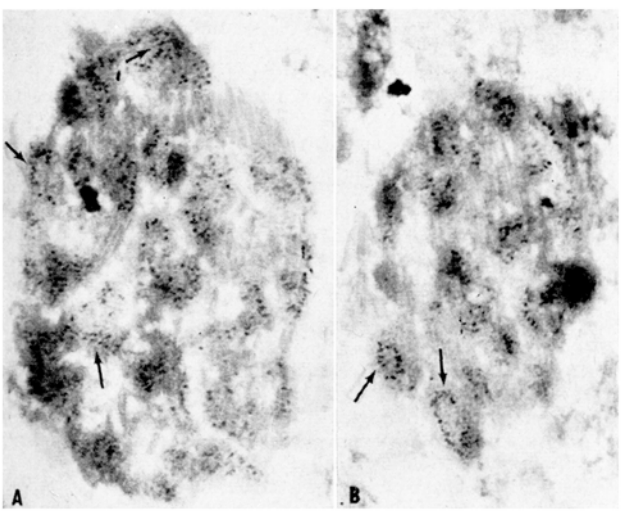
[7] K. G. BLAIKIE and W. H. PERKIN, J. chem. Soc. *1924*, 296.
[8] With the exception of the 4-benzyloxy compound all the benzyloxygramines were available commercially (Regis Chemical Co.); the 4-benzyloxygramine was prepared from 4-benzyloxyindole by the method of STOLL et al.[9].
[9] A. STOLL, F. TROXLER, J. PEYER, and A. HOFMANN, Helv. chim. Acta *38*, 1452 (1955).
[10] The catalyst was moistened with water to reduce the danger of spontaneous ignition on contact with the methanol.
[11] Obtained from L. Light & Co.
[12] This investigation was supported by grants from the Department of National Health and Welfare (Ottawa) and the Government of Saskatchewan (Department of Public Health).

Electron Dense Inclusions in the Nucleoli of the Myxomycete *Physarum polycephalum*[1]

Electron dense inclusion have been observed in the nucleoli of a variety of organisms either as a component of the 'nucleolonemata'[2–5] or without an apparent relation to these[6]. Some observers describe them as granular particulates[2–4,6], others as coiled threads[5]. Electron dense structures also occur in the nucleoli of the myxomycete *Physarum polycephalum*. In this coenocytic organism the nuclei divide in synchrony and the nuclear membrane persists throughout the mitosis[7].

Nucleoli from any stage of the mitotic cycle contain filamentous structures ('nucleolonemata'[8]), which are visible under phase-contrast in ethanol-fixed smear preparations. At the high resolution of the electron microscope (fixation with osmic acid), these filaments appear to be composed of material of high electron density embedded in a less dense ground substance (Figure). Superficially, the dense material appears as vaguely outline 'granules'. However, the frequently linear arrangement and shape of these 'granules' (see arrows) suggests that they actually represent pieces of coiled threads which are sectioned at various angles to, and at various distances from their axis. After the disintegration of the nucleoli during prophase, the electron dense inclusions are found as comparatively large (100–800 Å) granules surrounding the spindle and the chromosomes. At telophase, they reappear along the chromosomes. A study is under way to determine the relation between the chromosomes on the one hand and the electron dense material and the surrounding ground substance on the other.



Nucleoli of *Physarum polycephalum*, osmium-fixed material, magnification ×28000. Arrows pointing at structures suggestive of coiled threads embedded in a ground substance of lower electron density.

Zusammenfassung. Der Nucleolus des Schleimpilzes *Physarum polycephalum* enthält Strukturen, die vermutlich dem Nucleolonema (ESTABLE und SOTELO[8]) homolog sind. In diese eingebettet finden sich Elemente, die sich elektronenmikroskopisch, nach Osmiumfixierung, mit starkem Kontrast abheben und anscheinend fadenförmig sind.

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Department of Biology, Brown University, Providence (Rhode Island, USA), March 12, 1962.

[1] This investigation was supported by USPHS Grant No. RG-8495.
[2] W. BERNHARD, A. BAUER, A. GROPP, F. HAGUENAU, and CH. OBERLING, Exp. Cell Res. *9*, 88 (1955).
[3] E. HORSTMANN and A. KNOOP, Z. Zellforschg. *46*, 100 (1957).
[4] K. KUROSUMI, T. KITAMURA, and T. IIJIMA, Arch. histol. jap. (Okayama) *16*, 523 (1959).
[5] G. YASUZUMI, T. SAWADA, R. SUGIHARA, M. KIRIYAMA, and M. SUGIOKA, Z. Zellforschg. *48*, 10 (1958).
[6] J. G. LAFONTAINE, J. biophys. biochem. Cytol. *4*, 777 (1958).
[7] E. GUTTES, S. GUTTES, and H. P. RUSCH, Develop. Biol. *3*, 588 (1961).
[8] C. ESTABLE and J. R. SOTELO, Instituto de Investigaciones de Ciencias Biologicas Publicaciones *1*, 47 (1951).