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Abstract

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Van Winkle, W. B. Evidence for a spindle apparatus in somatic nuclei of Neurospora.

A previous report presented ultrastructural observations of the slime mutant of Neurospora (Van Winkle 1969 Neurospora Newsl. 14:5). Further studier have shown this mutant to be amenable for observations of the fine structural aspects of somatic nuclear division (Van Winkle et al. 1971 in press). The confusion engendered by conflicting interpretations of somatic nuclear division in Neurospora studied by light microscopy seemed to warrant a study of those features of division not resolvable through light microscopic techniques. The presence in Neurospora nuclei of a definite spindle apparatus, usually equated with a more "conventional" form of mitosis, has been suggested previously by Bakerspiegel (1969 Neurospora Newsl. 14:5) ond Robinow (personal communication, 1970) but hod not been reported with certainty.

Electron microscopic observations of glutaraldehyde-OsO_4-fixed hyphlet cells of the slime mutant (heterocaryon fz; sg; arg-1, cr, our, or-1; + al-2, nic-1, lys-3, or-1. FGSC#327) have revealed the following aspects of somatic nuclear division:

1. Somatic nuclei in the process of division have present within their nucleoplasm a definite spindle apparatus consisting of 180 Å microtubules.
2. In conjunction with the spindle, specialized regions (spindle plaques) on the external surface of the nucleus act as termini for opposite poles of the spindle and may be involved in the polymerization ond orientation of the forming spindle fibers.
3. A dense granule-spindle plaque complex observed in the early stages of division may represent the "centriole" observed in light microscopic studies.
4. Not only spindle fibers (which attach to chromatin regions), but also a tightly compressed longitudinal bundle of filaments (which stretcher the late telophase daughter nuclei) is seen. This filament bundle may be similar to the "Zentralstrang" described by Girbardt. (1969 Protoplasma 67:413).

Although the complete sequence of events during somatic division in Neurospora has not been fully observed, the presence of such features as a spindle apparatus and its attachment to chromatin regions and division stages believed to be prophase, anaphase and telophase seems to indicate that somatic nuclear division in Neurospora is not unlike the "classical" or "conventional" mitosis found in other organisms. = = = Department of Zoology, University of Texas, Austin, Texas 78712. Present address: Baylor College of Medicine, Houston, Texas 77025.