Book Review

Peter Brandt. *Evolution der eukaryotischen Zelle.* Georg Thieme Verlag, Stuttgard, 1991, 157 pp., 57 figures, 11 tables. DM 48· – ISBN 3-13-772301-9

This soft cover booklet deals with the molecular biology concerning the evolution of the eukaryotic cell. Its chapters present the origin of the Earth and early evolution; organization of pro- and eukaryotic organisms; hypotheses of eukaryogenesis (bacterial cells' evolution via compartmentalization and/or endosymbiosis); fossils and the significance of sequential evolutionary trees; gene transfer and mixed DNA; organization and the polyphyletic source of mitochondrial and plastidial DNA; polyphyletic code usage and RNA editing; source and function of introns, isozymes, ATPases, and evolution of protein transport mechanisms, and regulation of mutual site exchange of nucleocytoplasm and organelles resulting from eukaryotic evolution.

The work of pioneers such as Oparin, Miller and Urey or Orgel is described. Unfortunately, the print in the volume is very cramped (single spaced) and written like a dissertation. The book has many illustrations (57 figures and 11 tables) which support the text well. Similarly, there are over 550 references which may supply a rich source of relevant literature citations to the interest of student and scientist.

The author does not mention the origin of the first eukaryotic representatives, i.e., members of the Rhodophyta (red algae) which are considered to be the eukaryotic pioneers (see Hori and Osawa, *BioSyst.* **19:** 163 (1986), and in *Mol. Biol. Evol.* **4:** 445 (1987). Neither can we find the studies of Sogin et al. published in *Science* **243:** 75 (1989) and elsewhere, who propose that *Giardia lamblia* (the protozoan that lacks mitochondria) might be a good candidate for the initial eukaryote [compare also, Hashimoto et al., *Endocytobiosis and Cell Res.* **9:** 59 (1992)]. In addition, there are some minor inaccuracies like the classification of the hot spring enigmatic organism *Cyanidium caldarium* which is once placed among the Rhodophyta (on p. 64 or 69) while on p. 110 the same thermophilic alga is identified with the Glaucophytes.

In spite of the above deficiencies, I find this volume to be a good source of information on symbiotic evolution of the eukaryotic cell. But why are the proponents of the other theory not mentioned, i.e. those who advocate a direct filiation (autogenous) in the evolution of the eukaryotic cell?

This German published and short, impressive book is an addition to other publications related to the subject (published in English) such as *Algal Symbioses* (W. Reisser, ed., Biopress, England, 1992); the series of

Endocytobiology I (Schemmler and Schenk, eds., 1980; *Endocytobiology II* (Schenk and Schwemmler, eds., 1983), both published by W. de Gruyter, Berlin); *Endocytobiology III* (Lee and Fredrick, eds., published by the N.Y. Acad. Sci., Vol. 503 (1987); *Endocytobiology IV* (Nardon et al., eds., 1990, published by INRA, Paris); and *Endocytobiology V* (Ishikawa et al., eds., 1991, Tokyo, in press).

Finally, I would recommend making all the necessary scientific and publishing revisions before considering a translation of this book into English. The information in this volume should widen the circle of readers and lead more students of evolution into the new world of applying modern tools for molecular biology research.

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