

## Analyses of nuclear proteins and chromosome structure of ancestral dinoflagellates.

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### SUMMARY

Dinoflagellates are one of the most famous groups of protozoa because of the unique characteristics of the nucleus. Their chromosomes are permanently condensed throughout the cell cycle and do not contain typical eukaryotic nuclear proteins such as histones. In addition, the typical eukaryotic chromatin structure, the so-called “beads-on-a-string apparatus”, cannot be observed in chromatin spreads made from isolated nuclei of dinoflagellates. Previously, dinoflagellates were considered to be the most primitive eukaryotes, and such a chromatin structure was regarded as a primitive feature of the eukaryotic nucleus. However, many molecular phylogenetic analyses have clearly shown that dinoflagellates recently branched from the eukaryote lineage, and that they secondarily lost the eukaryotic nuclear features. Previous studies have reported the presence of six major basic proteins of low molecular weight (14–17 kDa) and two higher molecular weight proteins (45 and 50 kDa) in core dinoflagellates. On the contrary, only one 23-kDa basic protein, namely Np23, was identified from the ancestral dinoflagellate *Oxyrrhis marina*. Np23 was reported to be localized in the chromosome-like structures in the nucleus, but there was no further characterization. In this study, to elucidate the molecular architecture of the dinoflagellate chromosome, we focused on the relationship between Np23 chromosomal protein and DNA in *O. marina*.