

Observations of cell division in living cells of *Tetrahymena* and *Paramecium* —a comparison

Toshiro SUGAI (Biological Sciences, Faculty of Science, Ibaraki University)

SUMMARY

Morphological studies of cell divisions in ciliates have previously been done using fixed cells. In this study, we describe our observations of cell divisions in living cells of *Tetrahymena* and *Paramecium*. In a dividing *T. thermophila* cell, the micronucleus (MIC) that has just completed mitosis on the cell cortex pulls the macronucleus (MAC). The MIC and MAC are in direct contact, after that, the MIC detaches from the cell cortex. In dividing *P. caudatum* and *P. aurelia* cells, the ellipsoidal MAC moves from the oral apparatus to the anterior contractile vacuole, transforms to a round shape and moves close to the division furrow. The round MAC then changes to a sausage shape and divides. The MIC is attached to MAC until the anaphase, but then detaches from the MAC and becomes randomly located in the cytoplasm. The MIC keep elongating and forms a very long separation spindle, which lies parallel to the elongated MAC. The MIC completes mitosis before the MAC has completed its division. Free cytoplasmic organelles usually move by cyclosis in *Paramecium*. However, when the number of organelles decreases, the organelles are mainly located in the posterior half of the cell. During cell division, the organelles move to the cell center, become located in a columnar space and show saltatory movement. After the cell division, the organelles are almost equally partitioned to the two daughter cells. Our research shows that *Tetrahymena* and *Paramecium* have different mechanisms to partition their DNA and free cytoplasmic organelles during cell division.