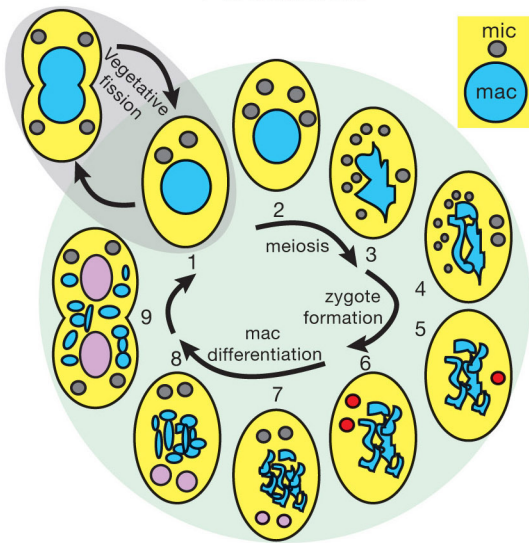
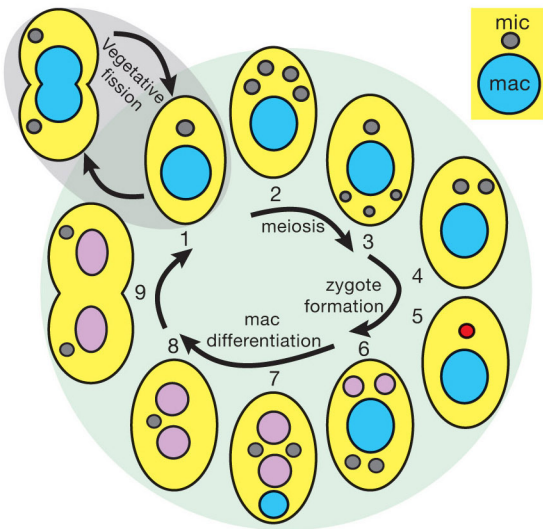


## Paramecium



## Ciliate Life Cycles



## Tetrahymena

**Figure 1. Life Cycles of *Paramecium* (top) and *Tetrahymena* (bottom)**

(Stage 1) Vegetative cells multiply by binary fission. Sexual development, stages 2–8, will initiate upon conjugation of two cells or autogamy (in *Paramecium* only). (Stages 2–3) Micronuclear meiosis ends with selection of one of the haploid products as the gametic nucleus and degeneration of those remaining. In *Paramecium*, the parental macronucleus starts forming lobes. (Stages 4–6) Zygote formation. An additional division of the selected nucleus produces two genetically identical haploid nuclei. During conjugation, one of the two identical gametic nuclei is exchanged between the two mates and subsequent karyogamy produces the diploid zygotic nucleus (red). During autogamy, the two identical gametic nuclei simply fuse together. Two additional postzygotic divisions (6) produce the undifferentiated micro- and macronuclei. (Stages 6–8) Nuclear differentiation. After the second postzygotic division, two of the resulting nuclei become the new micronuclei, while the other two begin differentiating into new macronuclei (pink). In *Paramecium*, the maternal macronucleus is fragmented. In *Tetrahymena*, it becomes pycnotic. Also in *Tetrahymena*, one of the new micronuclei degenerates. (Stage 9) Caryonidal division: This first vegetative division is special, as new macronuclei are distributed to the daughter cells without division while micronuclei are segregated to progeny by mitosis. Finally, fragments of the *Paramecium* parental macronucleus are nondividing, but remain until lost through random distribution during subsequent fissions.