

**THE EXPRESSION OF GAMMA-TUBULIN GENE CHANGES DURING
THE CELL CYCLE, AND ITS DEPENDENCE ON THE
MICROTUBULAR CYTOSKELETON NETWORK IN A CILIATE
*TETRAHYMENA PYRIFORMIS***

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Gamma-tubulin is a protein involved in the nucleation of the microtubules, and it is required for basal body duplication in *Paramecium*.

We cloned the single gamma-tubulin gene in *Tetrahymena pyriformis*, and analyzed its expression during developmental processes.

During the cell cycle of *Tetrahymena*, basal body duplication, cilia growth, and changes in cytoplasmic and intranuclear microtubules occur. We found that the gamma-tubulin mRNA level changes during the cell cycle of *T. pyriformis*, but the gamma-tubulin protein level seems to be invariant. A high level of the gamma-tubulin mRNA is associated with those stages when the maximum proliferation of the basal bodies occurs, whereas prior to and during cytokinesis, the gamma-tubulin mRNA level is very low.

Deciliation of *Tetrahymena* leads to cilia regeneration without basal body duplication and without changes in the cytoplasmic microtubules. During cilia regeneration, the gamma-tubulin mRNA level decreases gradually, and remains low even after cilia regeneration is over.

Microtubule polymerizing or depolymerizing drugs do not affect the majority of the cortical microtubules in *Tetrahymena*, but they do induce changes in the cytoplasmic microtubular network. The level of gamma-tubulin mRNA slightly increases after the treatment of *T. pyriformis* cells with a microtubule-depolymerizing drug (nocodazole), and slightly decrease after treatment with a microtubule-polymerizing one (taxol).

In *T. pyriformis*, the gamma-tubulin mRNA level depends on some protein factor, since the level of gamma-tubulin mRNA drastically decreases after treatment with cycloheximide.

Our findings suggest that gamma-tubulin gene expression depends on the cell cycle, and on microtubule polymerization and depolymerization processes, and can be disturbed by protein synthesis inhibition. The gamma-tubulin gene seems to be regulated in a different manner to alpha- and beta- tubulins in *Tetrahymena pyriformis*.

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