



# Characterization of a polyubiquitin gene in *T. thermophila* and of ubiquitin gene expression during sexual reproduction and under stress conditions

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## Abstract

A 5-unit polyubiquitin gene, *TTU3*, was isolated from a *T. thermophila* genomic library and sequenced. This gene presents an extra triplet coding for Phe, a AGAGA motif and a putative HSE element in its 5'-non-coding region. The ubiquitin gene expression in this ciliate was investigated by Northern blot hybridization in conjugating cells or cells under stress conditions. Exponentially growing cells express two ubiquitin mRNAs of 0.75 and 1.8 kb and a new species of 1.4 kb is induced under hyperthermic stress. During sexual reproduction of the cells (conjugation) the 1.8-kb mRNA is still transcribed whereas the steady-state population of the 0.75 mRNA transcripts is strongly diminished. Southern blot analysis suggests that ubiquitin in *T. thermophila* constitutes a large family of about ten members.

## Keywords

- Ubiquitin mRNAs;
- Genomic organization;
- *Tetrahymena*;
- Ciliate;
- Conjugation;
- Hyperthermic stress

## Abbreviations

- bp, base pair(s);
- HSE, heat shock element;
- kb, kilobase(s) or 1000 bp;
- SDS, sodium dodecyl sulfate;
- SSC, 150 mM NaCl/15 mM sodium citrate pH 7.0;
- *T.*, *Tetrahymena*;
- Ub, ubiquitin(s);
- *Ub*, gene encoding Ub;
- ::, novel junction (fusion or insertion)

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