

Isolation and characterization of mastigonemes and contractile cytoplasm from a gliding euglenoid flagellate *Peranema trichophorum*

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Peranema trichophorum shows a unidirectional gliding locomotion on the substratum at a speed up to 30 $\mu\text{m/s}$. Flagellar surface motility was visualized by translocation of polystyrene microspheres, which moved in close association with the extensive coat of mastigonemes on the anterior flagellum, indicating that the mastigonemes are involved in the force-generating mechanism responsible for cell gliding. We developed a new monoxenic sterile culture method by adding commercial milk to the culture medium. Flagella were isolated from the cell body by repetitive cold shocks, from which mastigonemes were subsequently detached by gentle pipetting. SDS-PAGE showed a major band at 40 kDa as a candidate protein that is localized in the mastigoneme. When compressed and crushed between a slide and a coverslip in a solution containing 0.1% Triton-X100 and 3 mM EGTA, a mass of elastic cytoplasm was released from the cell. The ejected cytoplasm was highly viscous and easily stretched by water flow, and became contracted in response to $> 5 \text{ mM Ca}^{2+}$ with a speed similar to that of the cell gliding. These findings suggest a possible involvement of the cytoplasmic contractility in gliding motion of *P. trichophorum*.